Sandro Fabbro *Editor*

Mega Transport Infrastructure Planning

European Corridors in Local-Regional Perspective

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Chapter 1
Local-Regional Perspective in Mega Transport Infrastructure Planning

Sandro Fabbro

This book is based on the research conducted in the context of Poly5, a European project promoted under the Alpine Space programme 2011–2014. The project attempts to critically deal with current approaches to the planning of European Corridors, showing all the enormous spatial criticalities of many major transport infrastructure projects (MTIPs), and with the theoretical and practical difficulties that strategic infrastructure planning inevitably raises. At the centre of Poly5 focus, there is one corridor in particular, that is, Corridor 5, now called Mediterranean Corridor.

This corridor was born with high hopes before the fall of the Berlin Wall with the aim to reconnect Western and Eastern Europe beneath the Alpine arc. At present, it is losing, one after the other, all those hopes, certainly due to the economic and financial downturn that has interested Mediterranean countries and also due to serious limitations that have characterized its planning and implementation at all the different involved levels.

Poly5 has the objective to learn from these difficulties and to explore new ways to plan and implement European corridors. The premise is that an illusion often arises when thinking of a major infrastructure project, even when it crosses many countries and regions, as if it might be legitimated by an aprioristic and uniform idea of its "public utility", whether at the European, at the national or at the local level. This is just an illusion for the simple reason that, a priori, one can only recognize the great differences in structures, interests and values of each territory and that, therefore, the public utility of the MTIP cannot be given for granted but must be constructed in a long consensus-building process. With this preliminary assertion, we do not want to insinuate that European spatial programmes, just because they inevitably clash with territorial differences, do not make sense. However, any relativistic and localistic approach to corridor planning and implementation must be rejected, such of the kind that every member state can interpret corridors as it

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pleases, which paradoxically corresponds to the current, timid and defeatist European transport policy. Nevertheless, it is equally true that the utility of a corridor (of any European corridor) cannot be demonstrated either on the basis of a simple recognition of the current or expected transport performance or by comparing transport issues with estimated costs of the infrastructure, or on the basis of a narrow localistic utility.

A general idea of the public good for the entire corridor does not exist, but rather it must be recognized and constructed by providing the cognitive and argumentative platforms into which the different spatial components could find their proper positioning and raison d'être as parts of a larger development project. Only with this constructive perspective, where a corridor is, to some extent, "unpacked"—but not fragmented—and the different strategies and different value contexts are not cancelled but acknowledged and considered as parts of a broader perspective, it would be possible to provide a credible and durable legitimating of the corridor itself.

1.1 Introduction

Starting from the analysis of serious deficiencies of the multilevel coordination and of the territorial governance of the Mediterranean Corridor, in the context of the wider policy for the Trans-European Transport Network (TEN-T) programme, this book attempts to learn from the available local-regional experiences in order to extend the discussion and generalize the findings alongside a possible redefinition of planning aims and tools towards new mega transport infrastructure (MTI) planning approaches. The book attempts also to demonstrate that, at least on the Mediterranean Corridor, coordination between European and national and between national and regional planning institutions seems to have had little success. Many planning issues and institutional capacities were probably given for granted in TEN-T policies, but practical experience has shown in the past 10 years that "multilevel governance" (a method that has been promoted to coordinate European spatial planning with national and regional issues and interests; see Faludi 2012; Schmitt and Van Well 2013) has been ineffective, lacking procedures and tools to be implemented and leaving processes on the shoulders and the goodwill of the single partners involved. As Jogan and Ferrara question (see Chap. 10), who does not remember the process that was launched in the early 2000s when European institutions tried to address the problem of spatial planning at continental level (CEC 1999)? Who does not remember the subsequent period of animated discussion that lasted several years, after the release of the European Spatial Development Perspective (ESDP), when most of the European planners were involved in trying to figure out the best way of coordinating different national or even regional planning systems and the huge literature produced on the matter (among many see Faludi and Waterhout 2002)? It is certainly true that this process has been considerably slowed down in the past years by the insurgence of the global financial crisis and the following European downturn, so that no real progress has been done in order to facilitate the

coordination of the decisions taken at different levels and in different places at the same time.

Notwithstanding the financial and economic crisis, it seems that problematic situations in planning and implementation of some corridors of the TEN-T programme could be due to an excessive ambition without an effective coordination of strategic planning and without clear responsibilities. On these criticalities, the Poly5 project, which is not properly a scientific research project, proposes a reflection, in the course of action—and therefore with practical and applicative aims—among some local and regional partners and some academic experts with the purpose to explore new ways and new tools to deal with the planning and the implementation of MTIPs.

The book presents, discusses and attempts to generalize this Poly5 approach. For this reason, it has been divided into three parts. In the first part of the book, a general discussion on the criticalities (if not the failures) of the multilevel governance and of the local-regional experiences is developed in order to analyse and reframe the corridor policy and delineate a new planning tool kit. This part presents concepts, perspectives and tools aimed at supporting more collaborative and robust infrastructure planning processes. This part is therefore mainly academic. The discussion starts from the analysis of criticalities taking place along the Mediterranean Corridor (see Chap. 3) and from the collapse of a multilevel governance practice. The poor approach adopted towards infrastructure planning, mainly at the national level, is criticized (see Chap. 2). The excessive emphasis given to the existing national interests versus the more general and future-oriented European interests is considered negatively because such an overly nationalistic approach has strongly limited the strategic potential of the very same corridor policy. Firstly, it has reduced time perspectives to the short term and fragmented spatial dimensions to the national borders; secondly, it has separated the infrastructure from the real territorial conditions, creating, in addition, the circumstances for strong local opposition; thirdly, it has limited the dynamic and morphogenetic potentialities of the infrastructure towards the crossed territories. Instead, a strategic corridor policy, according to the Poly5 project, in order to broaden opportunities and consensus on corridor implementation, should necessarily imply the consideration of other points of view: (i) a wider time-space, environmental and socioeconomic perspective (see Chaps. 4, 8 and 9); (ii) a "territorialization" of the infrastructure project (see in particular Chap. 7); (iii) a morphogenetic approach to the urban and metropolitan settlements crossed (see Chap. 5). In other words, corridor megaprojects should be considered strategic, dynamic, open and adaptive devices requiring:

- To explore the overall future potentialities of the corridor as well as to promote the construction of desired futures in the interested territories (see Chaps. 10, 11 and 12).
- To be enforced, in supporting their difficult implementation, by the institutional capacity to organize a multilevel and multinational governance system capable to override national jurisdictions (see Chap. 6).

In the second part of the book, reports on the local-regional experiences made along the Mediterranean Corridor are illustrated. These contributions are directly reported by the institutional partners involved in the Poly5 project and narrate their concrete experiences in order to reframe and adapt the national corridor policy to the local and regional needs and perspectives. These reports demonstrate the existence of real bottom-up efforts to elaborate regional-local solutions to the corridor opportunities and threats. The search for new approaches has to be considered an occasion to creatively learn from the failures of the process. The *Démarche "Grand Chantier"* in France; the governmental observatory in the metropolitan area of Turin; the proposed alternative routes and their assessment in the Veneto Region; the elaboration of scenarios of economic impact of the corridor in the regional contexts as in Carinthia (in Austria) and in Friuli Venetia Giulia (in Italy); the construction of a new cross-border transport node between Italy and Slovenia—all these experiences, made along the Mediterranean Corridor and along its ramifications, show that the traditional set of institutional and politico-administrative tools (knowledge bases, plans, programmes, projects), in their traditional sequence, are no longer sufficient. Thus, learning from these experiences, a redefinition of planning tools is proposed within the corridor policies towards a new MTIP planning approach. The very last chapter is an afterword by Klaus Kunzmann whose stature and scientific contribution are briefly outlined in Sect. 1.3.2 "Reframing the corridor".

1.2 The Mediterranean Corridor and the Poly5 Project

Large transportation infrastructures play a key role in eliminating friction caused by remoteness as well as in promoting national and regional economies and competitiveness (Castells 2010). The European Union (EU), since the Treaty of Rome (1957), is an ardent supporter of this politics of space (Ross 1998) that has been promoted, with huge programmes, for pursuing a common and accessible space for transport and socioeconomic development. Accordingly, two fundamental policies have been adopted in the past 20 years: (i) the Pan-European corridor strategy to develop essential axes with the aim of integrating newly annexed eastern countries within a larger Europe and (ii) the TEN-T strategy to develop a network of priority projects with the intent to enhance connectivity within the Union.

Since 2004, the TEN-T programme has given impulse to the realization, among others, of the Pan-European Corridor 5 (now Mediterranean) through prioritization of projects from Lyon to the Ukrainian border. To facilitate coordination, this megaproject was divided into five main sections, each with its own financial budget, separate timetable and implementation schedule: (1) Lyon–Turin; (2) Turin–Venice; (3) Venice–Ljubljana; (4) Ljubljana–Budapest; (5) Budapest–Ukrainian border. Neglecting, from the very beginning, particular consideration of territorial differences, the implementation revealed greater difficulties and delays both in cross-border sections over Alpine areas and in sections over areas without large cities but

with ecological values or landscape amenities. However, the Italian government interpreted and approved the corridor mainly as a "high-speed/high-capacity" (HS/HC) railway crossing the Po Valley from Turin to Trieste. For this reason, the Italian government included it in the Legge Obiettivo (law n. 443/2001) among the infrastructures considered "strategic" for the country. This meant to grant priority in the construction of "strategic" projects. Moreover, the following Strategic National Framework (SNF) 2007–2013, which has been a programmatic document of the Italian Ministry of Infrastructures and Transport, aiming to integrate the national infrastructural policies with the European ones has defined the "Strategic Territorial Platform Corridor 5-West" and the "Strategic Territorial Platform Corridor 5-East" as two macro-territorial systems, across several Italian regions—traversed by Corridor 5—in order to facilitate its planning and implementation in both northwestern and northeastern Italy (Fabbro and Mesolella 2010; Fig. 1.1).

Notwithstanding the strategic importance for the whole Po Valley in Northern Italy, the current development of the Mediterranean Corridor is highly fragmented and proceeds piecemeal. The only section with good chances of completion in a reasonable timeframe appears to be the Turin–Venice. The completion of the Lyon–Turin is foreseeable, in a longer timeframe since it has recently undergone a fruitful planning and decisional process thanks to the commitment of the governmental observatory, which—established in 2006 following hostilities in the Susa Valley—has mediated, with the local territories, the plans for the new HS railway crossing the Western Alps between France and Italy. Development of eastern Alpine sections appears hindered by small catchment areas and scarce traffic figures that leave little hope for large investments in new infrastructure other than upgrading existing lines. Moreover, it is probable that the existing trans-Alpine passes and the tunnels about to be opened may boost the north–south freight traffic sooner than other infrastructures. Currently, the alpine passage through the Gotthard or the Lötschberg–Simplon tunnels (between Italy and Switzerland) appears a valid solution, in the medium-short term, as an alternative to the yet-to-be Fréjus tunnel (between Italy and France). Comparably, the Baltic–Adriatic Corridor is assuming a key role in the redefinition of the European "core transport network" (EC 2011), potentially functioning as part of the gateway between the Adriatic Sea and Central and Northeastern Europe.

The planning and implementation of the Mediterranean Corridor shows, therefore, many criticalities, if not basic mistakes at its conception, certainly due to a neglect of the radical territorial differences as well as to a severe underestimation, if not a misrepresentation, of the existing situation as well as of the possible evolutions in a period of serious economic downturn (Fabbro et al. 2015; Fig. 1.1).

So far, it seems as if the Mediterranean Corridor is choking all those hopes for which it was conceived because it has been incapable to interact, for the limits of approach that have characterized it, with all the many spatial and temporal complexities and uncertainties challenging any major spatial project. Thus, Poly5, as a European project enacted under the Alpine Space programme, aims to reverse the current corridor's planning approach and proposes to reframe it towards a more effective activation of the various involved territorial components. These are, in

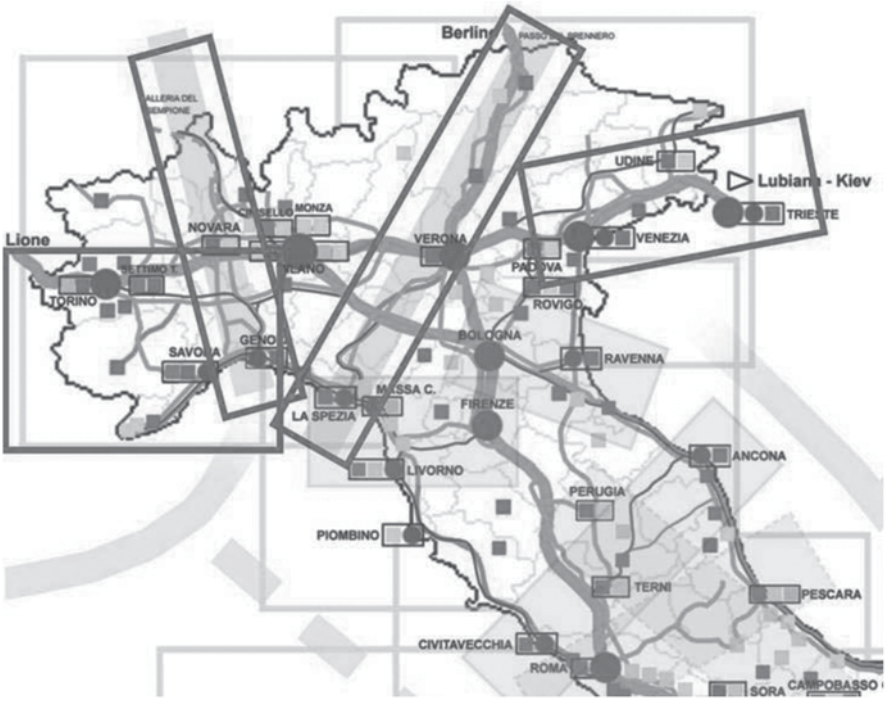

Fig. 1.1 Transnational platforms on the European corridors crossing northern Italy. (Source: MIT 2007)

fact, recognized as parts of a wider and more complex general perspective that, as a whole, can generate motivation and legitimation for MTIPs. Therefore, only in this "plural" perspective, where the corridor itself is, to some extent, unpacked—but not fragmented—and the different strategies and different value contexts are not cancelled but recognized and considered as parts of a broader European project, a corridor will be legitimated.

1.3 The Poly5 Project Approach

The Poly5 Partners

Cooperation among project partners in the Poly5 project is based upon each one's previous experience in addressing issues related to MTIPs in the past years. These experiences have matured at different administrative levels and they express different local and regional instances. The project lead partner is the *Province of Turin (now called Citta Metropolitana eh torino)* that developed a strategic plan for the

western cross-border areas interested by the Lyon–Turin HS railway following the governmental observatory's work to promote governance and participation of local communities.

The Province of Turin, also the *Province of Gorizia,* situated on the eastern cross-border area between Italy and Slovenia, has developed cross-border experience in projects dealing with MTIPs. Both provinces express the administrative link between regional and local needs but, at the same time, are promoting territorial forms of cross-border cooperation. The *Veneto Region* administratively represents a wide territory that strongly interacts with the Mediterranean Corridor, and that is now particularly concerned with the assessment of different possible track layouts of the new HS railway. The *Regional Development Agency of the Ljubljana Urban Region* acts as a regional promoter of local development policies. It addressed issues linked to MTIPs, and how they impact locally. *Transpadana* is a private association, whose aim is the promotion of the Mediterranean Corridor, operating with other homologous organizations in France and Slovenia and with the European General Directorate for Transport. Transpadana is responsible for a meticulous daily monitoring of TEN-T corridors in Northern Italy to facilitate their implementation. The *General Board of Savoie* is an active promoter, on the Lyon–Turin HS railway, of the *Démarche "Grand Chantier"*, which is a set of actions supporting the implementation of the French section of the Mediterranean Corridor. The *Municipality of Šempeter–Vrtojba* represents the Slovenian partner of the Province of Gorizia on the eastern cross-border area. It cooperated at cross-border level on transport and connectivity issues and currently embodies local community instances.

Furthermore, three university partners bring a scientific perspective into the whole project, providing a research approach and the link to the academic world. The *Department for Civil Engineering and Architecture* at the *University of Udine* has been involved in studies for the integration of European corridors into local areas for many years and it also provides consultancy at Italian Ministerial level. Then, the *Department of Spatial Development, Infrastructure and Environmental Planning at the Vienna University of Technology* has experience in complex regional and territorial policies and visioning. Finally, the *Technical University of Munich* has developed a particular experience in strategic spatial planning.

Reframing the Corridor

There are three institutional levels normally implied in corridor planning and implementation: the European, the national and the regional-local level.

- The European level is concerned, in a first phase, with a rough identification of the corridor layout and, in a second phase, with the identification of the cross-border sections of the corridor. In these sections, particular European regimes are promoted, both in financial and in juridical terms, to allow a faster construction of the corridor in accordance with the different interested member states.

Normally, only short sections of the corridor are directly implied in this cross-border regime (with reference to the part of the Mediterranean Corridor studied in the Poly5 project, the two cross-border sections are the western cross-border section, 80.4 km long from St.-Jean-de-Maurienne in France to Chiusa San Michele in Italy, and the eastern cross-border section, 35.6 km long from Trieste in Italy to Divača in Slovenia). General European regulations, financial contributions on cross-border sections and "territorial cooperation" issues are, therefore, the main European tools not only to promote cross-border sections, but also to plan and implement, from the European perspective, the whole corridor.

- The national level is concerned with national procedures for the planning and the implementing of the infrastructures of national strategic importance. In Italy, according to the 2001 constitutional reform, the infrastructure systems of strategic interest are delivered in concurrence by the state and regions together. The national section of the corridor is consequently divided into regional sections in order to allow the promotion of the infrastructure projects through a specific agreement (the so-called "Intesa") between the state and the single region interested. This phase of the planning of the corridor layout is mainly concerned with the localization of the road or railway tracks along the regional territories without particular discussion of the strategic, functional, typological and technological structure of the corridor that seems to have already been decided at the national level. The national state, moreover, has the task of setting priorities and funding works with its budget.
- At the local-regional level, there are normally conducted procedures only to adopt and implement the already decided track layouts in order to make them formally feasible through specific technical projects on the regional-local plans. However, without participation protocols implemented in order to build the necessary consensus towards the project and its concrete layout, it is very easy, at this point, for many negative reactions to emerge in the interested territories against the whole project.

It is doubtless that a corridor should perform different potential roles in correspondence with the specific metropolitan areas or regions traversed. For instance, along the Po Valley in Italy, the western section of the corridor is mainly traversing a metropolitan region, extending from Turin to Milan, which is also strictly connected to the north–south axis of former Corridor 24 (from Genoa to Rotterdam, now called Rhine–Alpine). This means that, whatever be the preferred scenario, the western section of the corridor, probably up to Verona in order to intercept also former Corridor 1 (from Helsinki to Valletta, now called Scandinavian–Mediterranean), is definitely both for freight and passengers, and, therefore, the corridor can assume, in typological and technological terms, a double HS/HC function.

However, it is equally true that the eastern section is completely different, because the urban structure there is articulated in a network of small–medium towns with no compact metropolitan areas (of at least 1 million people), from Verona to Ljubljana. Eastern territories, therefore, do not show the minimum conditions to justify the realization of a HS railway corridor for passengers. Whereas a HC

corridor for freight transport is justified by the presence of an economic base particularly oriented to export manufacturing and by the existence, on the North Adriatic Sea, from Venice and Trieste in Italy to Koper in Slovenia, of a logistic system made also of several ports.

These observations are quite obvious and it should be up to member states to take this into account when planning the layout of a corridor. In reality, the Italian Strategic National Framework 2007–2013 had just taken into account the territorial diversities of the traversed regions by outlining a national programme articulated into 16 "territorial platforms" (Fabbro and Mesolella 2010; Chap. 17). However, this design has not played a decisive role in the national infrastructure planning procedure, having remained only a general framework of reference for the spending of the European Structural Funds 2007–2013 without any effective role of mandatory framing.

The corridor, therefore, according to its 2004 blueprint by the European Commission, has always been interpreted, at the national level, from France to Slovenia, as a uniform infrastructure with a homogeneous functional and technological configuration as if the new railway had to be, at the same time, "high speed" for passengers and "high capacity" for freight transport independently of the urban structure of the territory traversed.

The planning process should have implied, instead, a multilevel institutional cooperation to be realized with some effectiveness in terms of interactive coordination. This kind of approach has been named, in the European policy, "multilevel governance" and, more recently, even "territorial governance".[1] In the case of the Mediterranean Corridor, there are many reasons to suspect that only a traditional and very simplified top-down procedure (with the addition of an evident and fatal neglect of the most important territorial parameters) has been realized, while a complete and effective "territorial governance", with the relative necessary knowledge and responsibilities, has not yet been adopted. An effective process of territorial governance should imply instead, first of all, a shared knowledge of the territorial structure. A first step towards this shared knowledge should imply the deconstruction of excessively homogeneous representations that normally accompany these huge infrastructure programmes.

The representation of a function, a process or a territorial project through the use of an inviting and charming metaphoric image is a rhetoric mechanism widely used to convince a larger audience of its utility and goodness. The degree of belief it generates is, often, so strong that few or none use to cast doubt on the quality and soundness of the image proposed. For example, the fact that the European transport

[1] The shift from "multilevel governance", as discussed by Faludi (2012), to what has been defined as "territorial governance" becomes explicit when incorporating strong territorial dimensions where also the spatial knowledge-related components are particularly evident and determinant. The shift from "multilevel governance" to "territorial governance" postulates, therefore, the understanding of territories and networks via processes of interaction that are specifically about the ways in which a territory develops: "only in this way, (relational) space as a social construct, as well as categories such as 'place' and 'territory' factors into multi-level governance" (Schmitt and Van Well 2013).

network (TEN-T) has been represented through a network of great corridors crossing the trans-European and Pan-European space has had a suggestive and evocative effect towards the unification and integration of a wide continental space (which, by the way, only the great empires of the past, with their political and military force, have had). But, one wonders if this narrative on the corridors, in a time of crisis of the very same "European dream", is sufficient to ensure the democratic consensus around them, and, consequently, their implementation. An exercise certainly useful, and not only from a scientific point of view, is critically entering in the great policy of transport corridors and trying to analyse it from the inside in order to understand where this policy has really its great strengths, and where are its weaknesses. As already mentioned, our analysis has a proactive intent and not disruptive. Similarly, to criticize the "blue banana" of Brunet (2002) in the 1990s, (Kunzmann and Wegener 1991) has reframed the European space in the form of a "bunch of grapes" to represent, more realistically and convincingly, its articulation and its intrinsic diversity. Making this, he has also placed, in some way, the theoretical and conceptual premises to promote the polycentric vision of the European space that, subsequently, was put on the basis of the European Spatial Development Perspective (the famous ESDP) at the end of the 1990s. It can be assumed, therefore, that the unpacking of the corridor policy is the inevitable step to escape from a spatial vision, artfully homogeneous, deriving from the representation of corridors as infrastructure with the same uniform technical layouts for hundreds and hundreds of kilometres. Following the thought of Kunzmann—who has made us the great honour to write an afterword to this book—and his approach to planning, based somehow on the deconstruction and reconstruction of great spaces according to a "bottom-up" evidence and "ethos", it can be understood that the grand image of European corridors can gain, from this critical unpacking, a great benefit. It can help to convince European people and territories of its goodness and utility and to revitalize the design, notwithstanding its evident diversity, of a unified Europe.

Deconstruction and Reconstruction of the Corridor

Planning and programming of large infrastructures projects require radical changes and not only in Europe (Priemus 2007; Marshall 2013; Yai 2013; Salet et al. 2013). This is certainly due to the current economic downturn and to the general reduction of public available budgets. But the current crisis is not the only cause of this inevitable change. This has deeper theoretical and practical reasons (see Chap. 2). In all modern countries, in fact, there is a growing demand for more democratic politics, for greater accountability in public policies and participation in the decision-making processes, not least for a deeper transparency in megaprojects (Flyvbjerg et al. 2003). All these conditions are somehow necessary and complementary to enhance the overall legitimation of MTIPs. In the case of a long corridor, the necessary legitimation is even more complicated by geographical and territorial differences that could be distributed along the way. Otherwise, if a certain level of utility is not recognized and guaranteed along the whole corridor and for the necessary time,

its implementation will have to cope with many inevitable conflicts rising along the corridor and during the different phases of its planning and implementation. Effective processes of territorial governance have been tested also in the wider spatial context of the Mediterranean Corridor (see Chap. 7). But all these reasons and tentative processes are claiming for new integrated, cooperative and interactive approaches, particularly between the macro-design formulated at higher levels and the micro local-regional areas involved. In fact, approaches taking for granted that large infrastructure projects would somehow find their landing on the territory without too many resistances and having, therefore, on the one side, underestimated these sources of complexity and uncertainty and, on the other side, overestimated the institutional capacities to deal with huge planning and implementation problems, seem to have failed their scope.

Hall, in his seminal work (1982), stated that many of the so-called "great planning disasters" seem to have been initiated on the basis of forecasts that were later found inadequate and misleading. But a more convincing explanation of these distorted, if not failing, decision-making processes can be that infrastructure planning is a typical "wicked problem" (Rittel and Webber 1973) for which, due to the many social, environmental and political factors involved, solutions exclusively based on principles of technical–scientific optimality are in general impossible. Moreover, as social and political conditions and views on the strategic mission of the MTIP will keep changing over time, the approach of Flyvbjerg et al. (2003), that is, the exploration of alternatives and the assessment of risks in order to increase stakeholder accountability and democratic participation, does not seem to eliminate the permanent problems of complexity, uncertainty and weak institutional capacity connected with a mega infrastructure project (Salet et al. 2013). A complementary direction of improvement would thus require a more robust and flexible approach to megaproject development in order to increase opportunities and to translate the lessons learned during a phase into new and more effective decisions and actions in the following steps. In their study, Salet et al. (2013), in order to identify more robust and flexible solutions in the context of mega infrastructure planning, propose to work on the following three strategic notions: the potential of "institutional change", the "processes of learning" and the need to balance the "generation and the reduction of the variety". Moreover, these three notions should be developed through four specific "devices": The first one, starting from the seminal work of Schön and Rein (1994), is concerned with the "framing and reframing of the strategic mission" of mega infrastructure projects in order to overcome their exclusive and rigid transport aims and functions. The second, namely the "mobilization of institutional capacity" (Dembsky and Salet 2010), tries to make things work better, arranging the coevolution of social and political energies instead of neglecting them in the deliberation process. The third is enabling open and future decision-making in order to preserve flexibility particularly when matters have not yet been settled. Finally, the fourth one is creating a learning environment in order to select different operational choices and guarantees an experimental attitude for testing the different options (Salet et al. 2013).

This approach converges with our definition of megaprojects as strategic, dynamic, open and adaptive devices (see, inter alia, Chap. 3) that, as already said, should require:

- A "planning tool kit" capable to explore the overall future potentialities of the different sections of the corridor as well as to promote the construction of desired futures in the interested territories
- To be enforced, in supporting their difficult implementation, by an institutional capacity to organize a multilevel and multinational governance system capable to overcome national jurisdictions

An organismic interpretation versus a mechanistic interpretation of the megaproject seems to be, therefore, a "meta-theoretical" condition to pursue a more effective approach to mega infrastructure planning. It is not so important now to blame the EU for setting high hopes or the national governments for believing in that design without adding much content on the modalities to realize them. However, it is very important to recognize that a uniform solution for a corridor implementation has created distrust and harsh conflicts. Whereas if the regional differences had been well considered at the proper time, it could have provided more local consensus and a more adaptable and resilient transport service in different regions along the corridor. As shown in this book, Poly5 project partners' local experiences demonstrate these connections and offer valid material to discuss failures and to learn new approaches and solutions.

Along the Mediterranean Corridor, the Poly5 partners' territories differ greatly from each other on important and fundamental spatial structures, on population density, urban dimensions, land use and so on. As we can read in the local reports elaborated by the partners and collected in the second part of this book, all these territories have somehow elaborated their own specific reactions to the idea of a uniform corridor and promoted solutions to integrate the corridor with their own specific local-regional context:

- Through the *Démarche "Grand Chantier"* in Savoie (France).
- Through the planning, also thanks to the work of the Italian governmental observatory—in cooperation with local institutions—of a less costly and more shared railway project on the Lyon–Turin HS railway.
- Through the identification of the best railway track—between three alternatives—and of the relative compensation strategies, in the Veneto Region in Italy.
- Through the identification of a "territorial strategic platform" capable of integrating the two TEN-T corridors, crossing the region, with the regional settlement and the economic structure in the Friuli Venetia Giulia Region in Italy.
- Through a local "node" made of a low-impact and resilient railway, instead of the previously planned and very-difficult-to-realize bypass through the Kars region, in the cross-border area of the Province of Gorizia (in Italy) and the Municipality of Šempeter–Vrtojba (in Slovenia).
- Through the elaboration of a future "vision" that includes the corridor in the Ljubljana Urban Region (LUR).

Among these different territorial approaches to the corridor, some common features are recognizable:

- All represent proactive initiatives of involved the territories to interact with the foreseen infrastructure.
- These proactive initiatives are mainly place-based development policies.
- All these place-based policies require, to be realized, a more or less strong adaptation of the layout of the mega infrastructure to the territorial needs, visions and perspectives.
- All these place-based policies require a certain restructuration of the territorial governance of the corridor towards a more visionary, strategic and integrated relationship between territorial needs and resources and the foreseen infrastructure.

Thus, the utility of the corridor, for the traversed territories, seems recognizable when (i) the territorial impact of the mega infrastructure is minimized through knowledge, transparency and participation (e.g. Lyon–Turin HS railway, Veneto Region, Province of Gorizia and Municipality of Šempeter–Vrtojba) and (ii) the territories can interpret the services generated by the transport infrastructure as inputs for a restructuration of the territorial system and the local economic base (*"Grand Chantier"* in Savoie, "territorial platform" in the Friuli Venetia Giulia Region, future visions of the LUR Fig. 1.2).

In conclusion, it can be stated that so far the planning and implementation of the Mediterranean Corridor has been based on a top-down decisional transfer, from the European level to the national level and then to regions and localities, without any systematic effort, at least in Italy (with the exclusion of the governmental observatory on the Lyon–Turin HS railway), to open new perspectives and opportunities for the interested territories at the different scales. This approach, moreover, has been enforced by an overly homogeneous and uniform interpretation of the corridor as a new HS/HC railway. The consequence of this excessively rigid and mechanistic approach is the decoupling of the infrastructure from the territory forced to accept it. Recognizing, instead, that infrastructure planning is a typical "wicked problem"—meaning that, as already said, the problem cannot have an optimal and exclusive solution—implies that the definition of the strategic mission of the infrastructure has to maintain a certain openness and that the framing and reframing of its mission, at the different spatial scales and in the different regional contexts, is a method capable to dynamically enhance its overall utility.

At this point, another, more general and theoretical question arises: If "utility" is a fairly good parameter to judge the validity of a public infrastructure, is utility a quality recognizable in the given situation (through, for example, a certain level of the existing transport demand and a certain balance between cost and benefits), or is it something to be enhanced and created *ex novo,* also thanks to the new infrastructure, through a system of visions, strategies and actions? This is not the place to analyse in more detail the issue and to search for an answer, but it is quite sure that utility, as a granted prerequisite, would be recognizable, in the context of transport infrastructure, only in limited situations. On the contrary, the European corridors

Fig. 1.2 The territories of the Poly5 project partners on the cross-border areas between France and Italy (*1:* Department of Savoie, *2:* Province of Turin) and between Italy and Slovenia (*3:* Province of Venice, *4:* Province of Gorizia, *5:* Municipality of Šempeter–Vrtojba, *6:* Ljubljana Urban Region). (Source: Fabbro and Brunello 2012)

were designed with the aim of pursuing (since the Treaty of Rome in 1957) a wide, common and accessible space for socioeconomic development and then for territorial cohesion. Consequently, the regions and cities traversed by a long transport corridor are expected to share this more integrated and distributed development. This means that utility could be a parameter neither for evaluating only the existing situation nor for evaluating the future trends on the basis of the extrapolation of the sole transport flows. On the contrary, utility seems to be a parameter that needs to be supported and demonstrated on the basis of a more robust and tuned project of the corridor in a tight coupling with the crossed territories. So, making reference to the previous presentation of the Poly5 partners with the relative territorial experiences, it seems possible to support that:

- The spatial project of a corridor has to consist in the integration of projects planned at different scales and in the different spatial contexts.
- The "utility of the corridor" has to be evaluated and measured also considering the synergetic effects of the many proactive projects elaborated alongside the corridor itself.

The practical but not trivial consequence is that methods and tools to promote and evaluate the public utility of the corridor should be mainly future oriented (e.g. spatial policies and strategic plans) and that the final overall utility of the corridor should be appropriately constructed considering at least a summation of the many "local utilities" alongside the whole corridor.

Tools to Explore New Morphogenetic Potentialities Alongside the Corridor

In correspondence with urban and regional situations that are interested by transport corridors, spatial policies and plans are being normally elaborated and implemented. But these planning initiatives are often aimed at locally legitimizing and justifying the already decided infrastructure programmes, instead of activating a process, capable of involving both the corridor and the local territory, to redefine the spatial order along the corridor and to enhance the utility of the whole corridor. So, due to their evident tactical nature, traditional planning and policy tools have often revealed ineffective.

Being aware that the infrastructure planning is a wicked problem and that traditional spatial planning is ineffective in overcoming local criticalities, the Poly5 project is aimed at the experimentation of a different approach based on the synergies between three spatial planning tools: scenario building, visioning and spatial strategy building. All these tools share a common characteristic: they allow not only to explore possible futures in a given territory but also to construct them. Moreover, they necessarily involve, in this reconstruction of the corridor, all the interested communities and stakeholders. These tools have been tested in three different areas belonging to the Poly5 project.

The scenario-building tool has been tested in the Veneto Region by a team from the University of Udine (see Chap. 3). The visioning tool (in the specific form of "visioneering", Salzmann 2013) has been tested in the LUR by a team from the Technical University of Vienna and with the collaboration of the University of Ljubljana (see Chap 11). The spatial strategy tool has been tested in the small towns of St.-Jean-de-Maurienne in Savoie and in the city of Susa, in the Province of Turin, by a team from the Technical University of Munich (see Chap. 12).

Spatial scenarios, visions and strategies are the basic tools for the construction of those "territorial projects" that can allow to somehow interact with the wider layout of the corridor. They are, in fact, synthetic and integrated representations both of the existing and the emergent reality, and, as such, they allow the connection between knowledge and action (Friedmann 1987). As they favour a process of interaction and collaboration that can bridge knowledge (of the existing order) with action (towards the emergent order), they can be nominated "cognitive mediators" in the sense that they try to mediate between present and future, for example the existing order with the desired spatial order.

Scenarios represent future possible evolutions, of the considered territory, that are constructed starting from some evidence of the existing situation. There is, anyway, an intrinsic difficulty to deal with scenarios: on the one hand, if we look only at scenarios based on the existing order, we probably find many reasons "to do nothing"; on the other hand, if we look with excessive optimism to the emergent order, we can neglect to tackle uncertainties and risks. The passage from "knowledge" to "action" allows overcoming this counter position. In this respect, the construction of a spatial vision can bridge the existing reality with the emergent perspective

(e.g. the existing order with the desired order) in a given territory because it mixes meanings, values, interests and expectations in a syncretic idea of the spatial future (Olesen 2013). However, there is no doubt that this operation, if not moderated by evidence-based scenarios, could be uncontrolled; at the same time, however, this tool could be very creative in terms of new ideas, solutions and perspectives. So, while scenarios and visions represent the bridge between knowledge and action, strategies represent the concrete set of actions that allow, in a more limited time and space and according to the available resources, to pursue some of the actions deriving from a general spatial vision. Consequently, a strategy is a set of actions coordinated in space, over time and between different sectors, that implies a specific type of knowledge, that we can call "strategic knowledge", that is referred to the most relevant spatial, temporal and cross-sector interactions and impacts. Methodologically speaking, the promotion of the utility of the corridor through appropriate policies and plans means, first of all, to put at work all together the different "cognitive mediators" (scenarios, visions and strategies) in the real urban and regional contexts intersected by MTIP programmes.

First Experimental Applications of the Tool Kit

In order to elaborate scenarios and, consequently, visions and strategies, the construction of a knowledge-base platform was, first and foremost, necessary in the context of the Poly5 project. For this operation, the construction of an information and communication technology (ICT) platform was taken into consideration (see Chap. 10) and named TEKNOSS (Territorial Knowledge Sharing System). This is a web platform built on a new technology (Semantic Wiki) derived from the knowledge management methods that has been devised within the framework of the "Semantic Web", a recently developed approach to the Web 3.0 (Jogan et al. 2012).

The purpose of this Semantic Web platform is to allow the local communities interested by the corridor to interactively participate in the knowledge-base construction and sharing in the specific considered domain. In this case, the domain is relative to the Mediterranean Corridor and to the processes and projects enacted in the territories interested by its passage and particularly in the cross-border Alpine areas. The knowledge gathered so far, at the level of each regional unit, refers to the whole process that goes from the launching phase of the corridor to the implementation of the single infrastructure projects.

Thanks to this knowledge base, it has been possible to propose regional scenarios and to support also the "visioneering" applications and the spatial strategy building.

In the case of the Veneto Region, which is a region without large metropolitan areas but with important manufacturing districts, four scenarios have been studied and proposed (Fabbro and Brunello 2012; Brunello's chapter in this book). One extreme scenario is built on the expectations deriving from a completely new layout of corridor though a full realization of the new HS/HC railway; another extreme scenario is essentially based on the rediscovery and upgrading of the existing infrastructure.

The remaining two are intermediate scenarios between these extremes. The current situation actually makes the ‘‘full scenario’’ very difficult to be implemented particularly because of the huge investments it requires against limited financial returns, especially in a region where catchment areas are not sufficiently adequate for HS rail. Consequently, the ‘‘null scenario’’ would appear almost mandatory, but this B-side strategy, if compared to the overly optimistic strategies pursued up until few years ago, seems a sort of minimalist adjustment to the existing situation and not worth overcoming, through important investments, the current downturn. The two intermediate scenarios are mainly conceived as a HC railway network capable of interconnecting logistic hubs, ports and regional clusters, with the markets of Central Europe. Therefore, these scenarios appear not only more adaptable to the existing territorial structure, but also capable of regenerating the economic base as a whole at both the local-regional and macro-regional levels.

As previously said, scenarios represent a limited range of concrete possibilities (some of them are more probable than the others) among which to identify the vision capable of activating the various actors and stakeholders. While scenarios are evidence based, visions are subjective representations of the future. They are given within the space of possibilities defined by the scenarios but, unlike these, imply a greater amount of willpower and resources. The four visions developed for the urban region of Ljubljana (see Chap. 11) range from combinations of short-term actions to prospects that involve more complex agreements with external areas and also international agreements as, for instance, the cooperation between the many Adriatic ports (see also Chap. 4). The scale of the urban region certainly seems more manageable and appropriate for “visioneering” especially because it appears closest to the size of “dwell and live” in the city; from the urban viewpoint, a vision can emphasize the effects of a corridor on urban mobility and the possibility introducing, through a corridor, significant changes on the accessibility and sustainability of urban transport. But visioning (and consequently its implementation in the form of “visioneering”) does not exclude other wider spatial scales as demonstrated in some contributions in this book (see Pedrocco’s Chap. 5 with reference to the metropolitan (Chap. 6) and macro-regional system of the Po Valley and Dillinger’s with reference to the European Strategy for the Danube Region).

Even the spatial strategies are, somehow, evidence based. But, unlike scenarios, they are real sequences of specific and localized actions. As such, they mainly concern spaces included in a local context and are particularly fit for small–medium-sized towns. Actions to be preferred are particularly those that generate more ripple and spillover effects according to the “impact model” used, and that connect more effectively the local dimension with the global economy (see Chap. 12). On these grounds, two new HS rail stations on the Lyon–Turin line, one in St.-Jean-de-Maurienne, a small French town at the entrance of the trans-Alpine tunnel and one in the city of Susa, an Italian centre at the egress of the tunnel, will be realized (Erhard & Dross 2013). These are not to be intended as mere tactical interventions or “territorial compensations” to increase the low level of consensus emerged in this cross-border territory, but they are significant local spatial strategies that radically change the role and function of the Lyon–Turin HS railway itself. Two new

stations at a relatively modest distance from each other, in fact, completely change the function of the HS line in the Alpine context; it becomes a transport service for a new accessibility in this Alpine area and for the creation of a multifunctional node of international importance.

1.4 Conclusions

The Poly5 project is not properly an academic research project but rather a reflection, in the course of action—and therefore with practical and applicative aims—among some local and regional partners and some academic experts, about the many criticalities connected with the planning and the implementation of MTIPs and with the purpose of exploring new ways and new tools to deal with this kind of criticalities. This book tries to present, discuss and generalize this Poly5 effort and approach.

At the beginning of the TEN-T policies, many planning and institutional capacities, with their positive expected outcomes, were probably taken for granted. The concrete experience has shown, instead, particularly in these last ten years, that "multilevel governance" (the method that has been promoted to coordinate European spatial planning with the national and regional interests) has been quite ineffective because it has neglected valid procedures and tools and has often left all the processes on the shoulders and the goodwill of the single partners involved. This book, on the basis of the outcomes of the Poly5 project, attempts to demonstrate not only that, at least on the Mediterranean Corridor (one of the nine corridors of the new TEN-T), an effective coordination between the European, the national and the regional planning of the corridor seems to have failed, but also that an alternative approach should be pursued. The alternative proposal here tries to deal with two major "failures" that often take place in the transport infrastructure sector: (i) the typical "market failure" that happens when the transport demand is too low to justify a private investment in the sector and (ii) the "failure of the state" when huge public spending, in particular in rail transport, is connected with very little social and territorial benefits. The solutions usually adopted range from a reduction of public spending and interventions in the sector (in favour of a stronger liberalization) to a deeper economic and financial control on the utility of the infrastructure plans and works. Although these solutions are necessary, they seem not sufficient to address the above-mentioned failures. So, our general hypothesis is that the above can be valid solutions only if intertwined with spatial strategies, aimed at vertical and horizontal subsidiarity, where cities and regions, namely, can play a strategic role as key stakeholders in the spatial transformation processes allowed by MTIPs.

Notwithstanding its importance, the current development of the Mediterranean Corridor is highly fragmented and proceeds piecemeal. The only section with good chances of completion, in a reasonable timeframe, appears to be the Turin–Venice while the completion of the Lyon–Turin is foreseeable, in a longer timeframe. On the other side, the implementation of the eastern Alpine sections appears hindered

by small catchment areas and scarce traffic figures that leave little hope for large investments in new infrastructures other than upgrading existing lines. Moreover, it is probable that the existing trans-Alpine passes and the tunnels about to be opened, may boost the north–south freight traffic sooner than the east–west transport infrastructures. Comparably, the Baltic–Adriatic Corridor is assuming a more important role in the eastern Alpine sections, potentially functioning as part of the gateway between the Adriatic Sea and Central and Northeastern Europe.

The planning and implementation of the Mediterranean Corridor shows, therefore, many spatial and temporal deficiencies, if not basic errors of conception, certainly due to an underestimation of:

- The radical territorial differences insisting along a corridor and reverberating also in terms of time effectiveness.
- The existing territorial structures as well as of the changes that occur during long periods of implementation.

According to the Poly5 project, it is not so important now to blame the EU for setting high hopes or the national governments for believing in that design without adding any innovation in the modalities to realize them. Rather, it is very important now to recognize that a uniform solution, as proposed for the corridor implementation has created distrust and harsh conflicts. Spatial and temporal differences need to be well considered at the proper time to provide greater local consensus and a more adaptable and resilient logistic and transport services in the different regions along the corridor. This means that a more organic (adaptability, responsiveness, openness to change, etc.) versus a mechanistic interpretation (e.g. traffic flows, carrying capacity, sliding speed, etc.) of the infrastructure megaproject, seems to be, therefore, a meta-condition to pursue a more effective approach to mega infrastructure planning and implementation.

A definition of megaprojects as dynamic, open and adaptive devices should therefore require:

- A “planning tool kit” able to recognize and explore, on the different and consistent sections of the corridor, the overall future potentialities of the interested territories as well as to promote the construction of desired futures in these territories.
- To be enforced, in supporting their difficult spatial implementation, by an institutional capacity to organize a multilevel and transnational planning and governance system capable to overcome national jurisdictions.

Circumstances happened in the last few years in Poly5 project partners’ areas, reinterpreted in the light of the classical literature on planning and planning failures (Friedmann 1987; Hall 1982; Rittel and Webber 1973) and in the light of the most recent literature on infrastructure planning (among others Flyvbjerg et al. 2003; Priemus 2007; Marshall 2013; Salet et al. 2013), seem to demonstrate these connections and validate this approach. It seems clear, namely, that the “strategic utility” of a corridor is a basic planning criterion that cannot be interpreted solely in terms of parameters either for assessing transport sector trends or even for assessing the

current situation of the transport demand. On the contrary, the utility is a planning criterion that needs to be supported and demonstrated on the basis of a more integrated and robust project of the corridor in connection with the territories directly and indirectly interested. If the project of the corridor consists also in the summation and integration of the many projects elaborated at the different scales and in the different spatial contexts, the "utility of the corridor" will be the outcome of complex synergetic effects of these many territorial projects emerging alongside the corridor itself. The practical consequence is that methods and tools to be used to promote the overall utility of the corridor should be mainly future oriented, and policies and plans should be appropriately constructed considering the regional and local utility that can be promoted alongside the corridor.

As conclusion of this introductive chapter of the book, it is possible, therefore, to claim that:

- European corridors should not be interpreted as homogeneous infrastructures defined by a top-down approach, nor should they be only a matter of mechanics. Instead, they should be regarded as complex devices that have to evolve in association with territories (e.g. cities, metropolitan systems and regions) that, notwithstanding their different histories, structural features, development perspectives, can provide the corridor with a higher utility through new services and specializations.
- Corridors are, first and foremost, the result of spatial projects for the urban, metropolitan and regional systems devised along their paths. As such, they are, therefore, inevitably future oriented.
- The design of a corridor, consequently, is not only a matter of evaluation of the existing and sector utility, but rather a matter of urban, metropolitan and regional projects that have to be interconnected with each other in order to create new local clusters, to open new markets and to multiply opportunities between the local and the global scales.
- Cities, regions, productive clusters can generate, alongside a corridor, a new spatial order in the wider European space. This also implies, however, the possibility, for territorial systems, to generate their own feedback in order to modify, if necessary, the infrastructure layout as well as its functional features, according to local needs and projects.
- The implementation of a European corridor is a complex chain of territorial projects belonging to different countries and to heterogeneous jurisdictions. As such, they cannot be completely delegated, from the EU to the member states, because they seem inadequate to assure the necessary cross-border cooperation and the effective interaction between different levels of territorial governance.
- Finally, the planning and design of the European corridors should be simultaneously considered a matter of harmonization and empowerment the European institutional capacity (towards the different member states' regulations and policies) as well as a unique occasion for improving the role and the accountability, according to a principle of subsidiarity, of the local and regional systems in the context of a more integrated and cohesive European space.

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Part I
Conceptualizations, Policies and Tools

Chapter 2
The Need for a Turning Point in Megaprojects Planning and Appraisal Practices—The Case of the Italian Section of the Mediterranean Corridor

Marco Dean

2.1 Introduction

Megaprojects can be defined as extremely complex infrastructure projects, costing typically more than US$1 billion, presenting usually long development cycles (in some cases even several decades) and generating substantial (direct and indirect) impacts on communities, environments and budgets (Flyvbjerg et al. 2003; OMEGA Centre 2011). This complexity, in particular, has to be considered not merely in engineering terms, but rather, it arises from the external context into which such projects are placed involving a number of actors and variables whose trends and mutual interactions are difficult to predict (OMEGA Centre 2008, 2011).

Over the past decades, megaprojects have started to be perceived as "icons" of development and have been increasingly built around the world (Graham and Marvin 2001; Olds 2001). However, cases of megaprojects which were initially promoted as principal solutions to all the problems of given territories and have then proved to be incapable of meeting the expectations are already well documented (see for instance Flyvbjerg et al. 2003; Samset 2010). International literature indicates that one of the main causes for these disappointing achievements dwells in totally inadequate decision-making processes as well as in extremely vague infrastructure development strategies which both fail to take into account emergent opportunities and threats generated by the turbulent external environment.

Quality infrastructure is certainly a key pillar of international competitiveness. Nonetheless, nowadays, the previous unsatisfactory megaproject development experiences together with the present economic and financial crisis, the decreasing available resources, the ever more pressing sustainability development paradigm as well as the rising level of dissatisfaction among local communities, perceiving

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megaprojects as "destroyers" of the environment, call for more responsible infrastructure investments. This chapter claims that in order to achieve this objective a drastic change in the way in which major projects are conceived, planned and appraised is essential. To illustrate this thesis the author presents the case of the Italian section of the Mediterranean Corridor. This project formerly known as Corridor 5[1] is a large-scale (and highly contested) railway axis which as part of the Trans-European Transport Network (Ten-T) should cross the continent from west to east linking the Iberian Peninsula to the Ukrainian border.

The remainder of the chapter is organized as follows. The next section defines the main features of megaprojects with a view to emphasize the existing contrast between their complexity and the conventional planning and appraisal practices framing the projects into narrow schemes of thought and action. The third section illustrates the decision-making on the Italian part of the Mediterranean Corridor (at the time when it was still termed as Corridor 5), and identifies a number of pitfalls which have affected the process. Section 4 focuses, in particular, on the section between the cities of Venice and Trieste (Northeastern Italy) highlighting the risk that, as direct consequence of these shortcomings, the project might not deliver the expected benefits. The main recommendations to pursue more sustainable investments in major infrastructure projects are presented in the conclusion section.

2.2 Megaprojects: A Matter of Irreducible Complexity

As Brockmann and Girmscheid (2007) underline, megaprojects are frequently described using different superlatives (the prefix "mega" is already one of them) and a series of outstanding attribute. Frick (2005), for instance, has identified six main characteristics of megaprojects, namely the "Six Cs". According to Frick, mega infrastructure projects can be defined as (1) *colossal* in size and scope as well as (2) *captivating* in terms of project's size, engineering achievements and aesthetic design. In fact, frequently, these projects not only serve as a strategic global function but also are conceived as "technological sublime" (see Nye 1994; Marx 2000) and symbols of "progress" (Olds 2001).

Megaprojects are then, of course, extremely (3) *costly*. Typically, a price tag in excess of US$1 billion is adopted to distinguish large-scale projects from conventional ones (see Flyvbjerg et al. 2003). Furthermore, the advent of the concept of "sustainable development" as key paradigm for long-term planning imposes to consider the costs of megaprojects in broader terms, paying attention also to the impacts produced on the natural ecosystems and local communities (OMEGA Centre 2010).

[1] According to the most recent revision of the TEN-T Programme (2011), Corridor 5 is now called Mediterranean Corridor, stretching from Spain to the Ukrainian border. From its original conception it has undergone a number of modifications, including extensions to Lisbon and Kiev in the attempt to spread the possible economic benefits derived from the project. However, owing to a difficult economic situation, both Portugal and Ukraine seem to have renounced to the project.

Such projects usually involve a complex network of participants often from multiple national, international, public and private sector organizations (Miller and Lessard 2000) so that, especially when the roles of the different agencies managing, operating and funding the projects are not well defined, (4) *control* problems may arise.

Moreover, while originally the term "megaproject" was adopted mainly to identify single-focus project, in the course of time its meaning has expanded to include programmes of a combination of megaprojects having sometimes even different characters (OMEGA Centre 2011). Additionally, particularly in urbanized areas, large-scale infrastructure projects build forward on existing realities so that any "single" megaproject cannot be regarded completely in isolation from the context in which it is placed. Indeed they complete existing networks, constituting with the latter a wider economic and technological system (Bertolini and Salet 2008). Therefore, in light of their multidimensionality, interactions and interdependency relations between their different parts, megaprojects can be considered as examples of (5) *complex* systems.

Finally, such projects are also (6) *controversial*. As a result of their size, their interdependencies with other infrastructure facilities, their huge impacts and their high political visibility any megaproject is always embedded in a complex network of interests due to the abundance of stakeholders with connection and influence in the project. Since the different parties present usually diverse values, interests and objectives, a number of conflicts over how resources should be invested, what criteria the project should meet, how impacts on the human and physical environment should be mitigated and even over how success should be defined are frequently generated (Capka 2004).

The extremely long gestation period of megaproject development cycles (in many cases lasting more than 30 years) is also recognized to be a complicating aspect. During the lengthy journey from the conceptualization to the realization of the infrastructure, financial, political, social and technological changes are likely to manifest leading to new constraints and new requirements concerning the delivery of the projects, alterations in the priority of the different parties and perhaps even modifications in the stakeholder groups themselves (OMEGA Centre 2008, 2011; Bertolini and Salet 2008; Priemus 2010).

It is therefore evident that megaprojects cannot be viewed as mere engineering artefacts. In this regard, the OMEGA Centre (2011) points out as such projects need to be framed according to a perspective broader than the typical project management viewpoint which focuses mainly on the delivery of a specific output within a defined timeframe by applying a certain amount of resource. According to the OMEGA Centre, effort should thus be invested in discussion and negotiation with key stakeholders so as to achieve the strongest possible consensus on a number of different issues, amongst those which are considered to be the problems of the involved territory, the possible course of actions proposed to overcome these problems, the boundaries within which the analysis should be carried out, the conflicting values that a given project should reflect, the criteria adopted to compare the different alternatives and all the different kind of costs and benefits produced by any

plausible initiative. Great emphasis should be employed, in particular, on the recognition of the impacts and implications of the changing (financial, political, social and technical) context throughout projects lifecycles. This shared problem analysis along with a stable institutional, policy and legislative environment is critical for the identification of robust and flexible solutions able to respond and adapt effectively to emerging opportunities and threats posed by the surroundings (see also Priemus 2008; Samset 2010; Priemus et al. 2013).

Notwithstanding this, frequently the underlying strategies and visions leading megaprojects appear to be poor and inconsistent (Dimitriou 2009). In other cases, hidden interests rather than strategic decisions turn out to drive effectively the projects (Flyvbjerg et al. 2003). Therefore, overall in decision-making procedures on megaprojects the tendency seems to be to simplify and speed up the procedures, narrowing the scope of appraisal, jumping to premature conclusions, avoiding the consideration of potential future downside scenarios, discarding possible alternative better options and limiting the involvement of those whose interests are affected (Salet et al. 2012; Priemus et al. 2013). It is thus evident that projects conceived in this way are likely to produce more losers than winners within the society. Projects presenting vague purpose may be easily jeopardized by political discontinuity with succeeding governments promoting or, conversely, opposing projects depending on the different political ideologies. Even in the event that the "green light" is eventu-

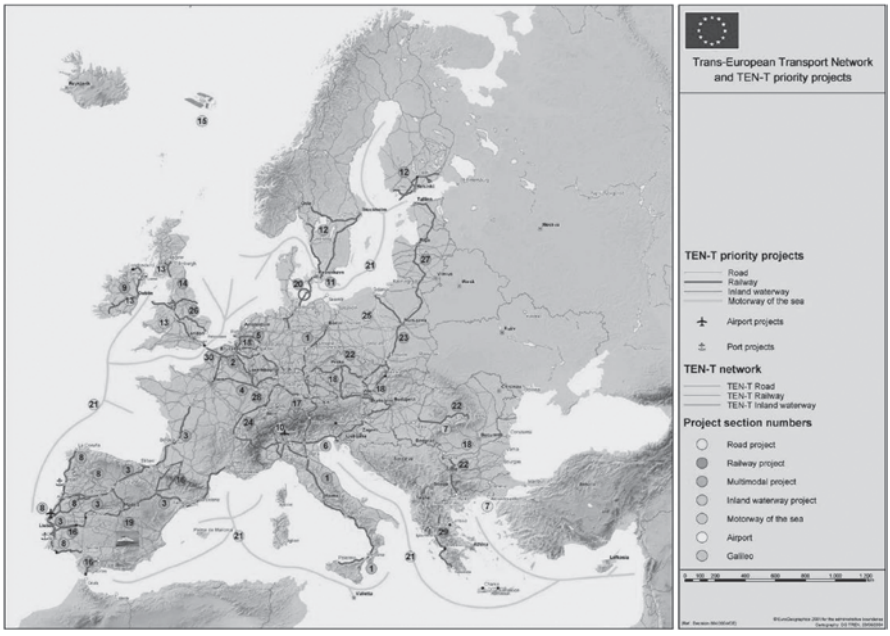

Fig. 2.1 Map of the 30 TEN-T priority projects. (Source: European Commission, © European Union 2005)

ally given, project outcomes almost unavoidably will diverge noticeably from those estimated in the original plans.

2.3 The Decision-Making Process of Corridor 5 in Italy: The Product of a Solid Vision?

Corridor 5 constituted a massive railway axis covering a distance of approximately 1600 km between Lyon and Kiev. This project is part of the Trans-European Transport Network (TEN-T) consisting of a set of major road, rail, air and water transport projects promoted by the European Union since the early nineties to connect together and integrate the transportation systems of the single member states (Fig. 2.1). This ambitious programme costing approximately 400 billion € (Council 2004) has been considered as vital for the economic, social and territorial cohesion among countries (Dühr et al. 2010).

Railway axes and high-speed rail (HSR) projects, such as those foreseen along Corridor 5, adopting appropriate technology which allow trains to operate over the threshold of 200 km/h are the key elements of the TEN-T. Specifically, Corridor 5 has been conceived, according to a high speed/high capacity (HS/HC) model, to

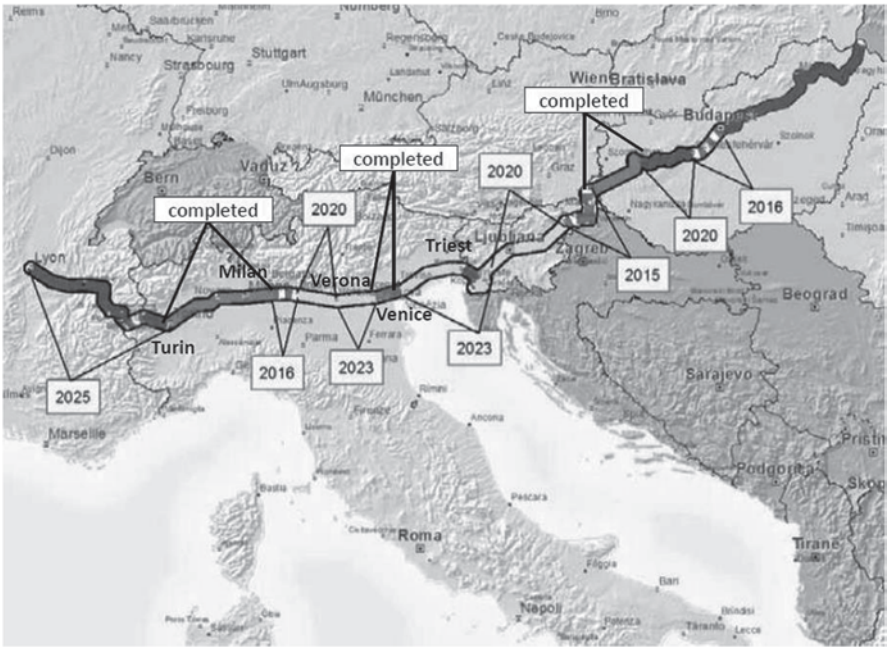

Fig. 2.2 Route of the Corridor 5 and its implementation level in 2012. (Source: European Commission, DG MOVE, TENtec Information System, © European Union 2012)

host both heavy freight trains and high speed passenger trains through the provision of two parallel tracks in each direction and low slopes along its route.[2]

The project whose current level of implementation is less than 20% (European Commission 2012) affects five nations, including Italy. The HS/HC railway axis traverses horizontally Northern Italy, stretching from the French border to the Slovenian one, and connecting the cities of Turin, Milan, Verona, Venice and Trieste (Fig. 2.2).

According to the European Union, the project will depict one of the key east–west routes in the TEN-T, enhancing transport capacity and enabling major travel time reductions for passenger trains. This greater efficiency, in turn, is expected to generate economic growth in the traversed territories as well as increase the modal share of rail against road (see for instance, European Commission 2005).

The Italian Government, in comparison, having endorsed these positive projections, included Corridor 5 among the infrastructure projects considered as critical to enhance the competitiveness of the whole country. Hence, with the *Legge Obiettivo* (Law n. 443/2001) Italy has attempted to speed up the construction of this new transport axis (as well as of the other "strategic" infrastructure projects affecting the Italian territory). Moreover, the *Quadro Strategico Nazionale* of 2007, which is a document aiming at integrating the national development strategies with the European directives so as to guide the allocation of European Funds in Italy for the period 2007–2013, has established two specific governance entities along the route of the future railway corridor, namely the "Strategic Territorial Platforms Corridor 5-West" and the "Strategic Territorial Platforms Corridor 5-East" (Fig. 2.3). According to the Italian Ministry of Economic Development, the two Platforms spanning over different Italian regions situated in proximity of the northwestern and northeastern borders of Italy could have an important role in facilitating its implementation. In fact, the Platforms would mediate the global and national interests with the regional and local ones, ensuring that the different territorial specificities would be opportunely accounted during the decision-making processes (MSE 2007).

Notwithstanding this apparently sophisticated normative, planning and policy framework, any concrete qualitative or quantitative evaluation has not been carried out, either at European or national level. The presumed impacts of the project on the traversed regions, its simulated performances in relation to a series of possible future scenarios and its possible mutual relations with the existing infrastructure networks have not been scrutinized with the necessary attention that such a complex project would have required (Ponti 2003; Bologna 2006; Prud'homme 2008; Rastello and De Benedetti 2013).

The interesting research carried out by Calafati (2006) focusing on the Italian western section of Corridor 5, between Lyon and Turin, brings to light an extremely faulty planning and appraisal process during which neither politicians nor promoters have been capable of providing any clear and valid argument in support of the project. This, along with the systematic exclusion of civil society from decision-making, has concurred to generate the public opposition to the project, particularly

[2] HSR lines are typically designed for passenger travel. Although freight trains can use HSR lines, they cannot run at high speeds mainly for security reasons.

Fig. 2.3 Transnational platforms on the European corridors crossing Italy. (Source: MIT 2007)

in the Susa Valley. Even the recent downsizing of the Lyon–Turin project from a massive HS/HC railway axis to a conventional railway line, so as to serve, practically, only the freight traffic has not completely stopped contentions which, in some occasions, have also degenerated into violence.

What is more, Mariotto (2004) points out that even the planning and appraisal phases of the Italian Eastern section of the new HS/HC railway of Corridor 5, between Venice and Trieste have suffered from the absence of clear analysis, proper public debate or consultation processes. In Northeastern Italy, in particular, notwithstanding the number of different hypothetical project solutions elaborated in the course of time by *Rete Ferroviaria Italiana,* a definitive route for this HS/HC railway project has not been established yet (Degano 2010; Sirovich 2010). Different interests and lack of coordination at the international level, between Italy and Slovenia (Maranzana 2012) and also more paradoxically, between the Italian regions of Friuli Venetia Julia (FVG) and Veneto—which are both encompassed within the "Strategic Territorial Platform Corridor 5-East" (Fabbro and Mesolela 2010)—have continued to postpone the achievement of any definitive project.

Moreover, in the meantime, as a result of political cycles and government alternations, the model of the "Strategic Territorial Platforms", in turn, seems to have been progressively dismissed in favour of other (even more uncertain) approaches (Dean and Fabbro 2011; Fabbro and Dean 2012), and the number of projects to prioritize included in the *Legge Obiettivo* has increased dramatically (Giannino 2010; Legambiente 2011) making the Law n. 443/2001 practically ineffective. The advent of the global credit crisis, which in 2008, contrary to all the expectations, ceased a long period of economic bonanza, has also had a noticeable impact on the level

of planned investments in favour of Corridor 5 (as well as of the other "strategic" infrastructure projects).

2.4 Corridor 5 Between Venice and Trieste: Anticipated and Realistic Impacts

Ponti (2003), Bologna (2006), Calafati (2006) and Rastello and De Benedetti (2013) arouse many doubts on the effective possibility for Corridor 5 to deliver the promised economic, social and environmental benefits to the traversed territories and the served communities. With reference to the section between Venice and Trieste, for instance, the current situation makes it difficult to see how these regions would benefit from an investment of approximately 7.4 billion € (MIT 2012) required to complete the project. First of all, many doubts emerge over the financial profitability of a HSR investment, especially of a HS/HC project in a territory characterized by a low-density development and the absence of major metropolitan areas (see Dean and Fabbro 2011; Fabbro and Dean 2012). International examples show, in fact, that HSR projects can only be attractive on high-demand routes between strongly populated cities (Givoni 2006). According to De Rus and Nombela (2005) the minimal demand necessary to justify a HSR line should be 8–10 million passengers per year, while Vickerman (1997) increases this yearly amount to reach a minimum of 12 million passengers. Therefore, an independent study undertaken by the Polytechnic University of Milan (Brambilla et al. 2003) points out that with a potential traffic of approximately 1.5 million passengers per year the financial performance of a possible HSR railway axis between Venice and Trieste would be extremely negative.

Given the settlement characteristics of this territory, it is also clear that the implementation of Corridor 5 alone would not be sufficient to achieve the overarching goal of territorial cohesion. In effect, HSR lines appear to be particularly effective in connecting major urban centres spaced at approximately 200 km intervals (Hall 1999). Furthermore, the intrinsic necessity for passenger trains to maintain a high average speed and, thus, preserve the benefits derived from travel time saving, implies a drastic limitation of the number of stations/stops along the routes (Givoni 2006). Hence, where a noticeable urban sprawl is present, such as in the northeast of Italy, secondary railway lines opportunely connected to the HSR lines at the HSR stops become fundamental to spread the benefits delivered by HS trains (significant reductions in travel time, increase of accessibility, agglomeration and regeneration effects, etc.) to the whole territory (Brunello 2011). On the contrary, between Venice and Trieste, until this moment, secondary networks do not seem to have been implemented efficiently (Region of Veneto) or to have been taken properly into consideration (Region of FVG). Hence, there is a high risk that the construction of Corridor 5 may cause overall negative socioeconomic impacts. When not adequately planned, in fact, HSR projects, by connecting only a limited number of places (main cities), are likely to exclude from accessing networks and consequently prevents

from benefits much of the intervening spaces (Plassard 1991; Spierkermann and Wegener 1994; Hall 1999; Martinez and Givoni 2009).

With regard to rail freight transport, even the projected economic growth as one of the direct consequences of the construction of Corridor 5 appears to be questionable. The drastic changes which have affected international trade have in fact made for the northeast of Italy (but also for the whole country) the south–north routes more attractive than the east–west ones (Honsell et al. 2006; Dean and Fabbro 2011; Fabbro and Dean 2012). However, what it seems more detrimental for Corridor 5 is the scarce consideration paid by decision-makers to the regional transport and logistics systems which would be required to support this railway corridor. Nowadays, the global, economic and logistic players, who dominate freight transportation and who are able to shift the points through which global flows transit, call for infrastructure systems capable of ensuring flexibility, reliability and responsiveness in order not to bypass it (Hepworth and Ducater 1992; Giannopoulos and Gillespie 1993; Castells 1997). Consequently, in a region, the increase in the traffic flows and the creation of high value-added activities are not achievable by the construction of a single infrastructure project alone but, conversely, to meet these objectives, other complementary interventions as well as specific policies and initiatives aimed at attracting high volumes of freight traffic are necessary (Nijkamp and Blaas 1994; Banister and Berechman 2000). Hence, for instance, to be effective, a railway corridor would require efficient seaports and inland terminals acting as gateways and hubs for the freight flows as well as a favourable and stable policy framework to attract private investors and favour regional development. These requirements collide with the contradictory plan of actions undertaken by the Italian Government during the last decades which have entailed the misuse of public funds for the creation of a disproportionate number of freight terminals that due to both infrastructure bottlenecks and normative constraints are unable to act as a single network (Censis 2009; Confetra and A.T. Kearney 2011). Hence, during the past decades, despite an extremely favourable geographical position at the heart of Europe, Italy and Northeastern Italy have been continually marginalized from the major trade routes (Beretta et al. 2009). Specifically, in the northeast of Italy, the system of ports and freight villages cannot cope with substantial increases in the traffic flows (Dean 2010a, b) and private investors promoting interventions oriented at increasing their capacity and efficiency have withdrawn owing to a negative political environment (see Fabbro 2011).

Finally, it is for the same reason, namely the lack of any clear transport development strategy, that, in the eventuality of the completion of the project, the touted modal shift from road to rail may also be likely not to take place. In Italy, state subsidies that benefit road transportation activities, the progressive reduction of short and medium distance rail services with reference to the passenger sector as well as other normative inefficiencies which often make the costs of rail for both passengers and freights higher than those of the competing transport modes, has led to a general and progressive underutilization of the national railway system. In the region of FVG, for instance, the utilization index of the regional railway network is only equal to 50 % (RAFVG 2011). It is, therefore, evident that the scarce recourse

to rail transport is not linked to infrastructure shortage but mainly to an inefficient use of it and to the inability to provide concrete modal shift incentives. Consequently, without decisive interventions in this sense, the construction of Corridor 5 in the northeast of Italy will not divert significant amount of traffic from road to rail. These considerations are also confirmed by a study carried out by Scott Wilson (2007) according to which, in these areas, even after 30 years from the completion of a HS/HC railway axis more than 60% of the total freight flow and more than 90% of the overall passenger traffic would continue to recur to the road as a preferred choice.

2.5 Conclusions: Towards More Responsible Infrastructure Investments

Infrastructure facilities are at the heart of economic and social development, increasingly providing the foundations for virtually every aspect of individual and collective life. In our globalized epoch, the proper functioning of modern economies requires efficient infrastructure systems capable of moving goods, people and information quickly, safely and reliably across greater distances. It is, therefore, evident that the wellbeing of population depends in large part upon the capacity to develop successful infrastructure projects including the large-scale ones.

At the same time, infrastructures project developments and in particular, megaprojects require careful planning to avoid the dissipation of the already scarce resources available for investments as well as to ensure the delivery of the full range of expected benefits. Therefore it would be fundamental to:

- Dismiss the common misconception of considering any new infrastructure project to be always the right answer to all the problems of a given territory without having undertaken firstly serious analyses of the existing spatial structure and the real issues affecting the area. The case of Corridor 5 seems to confirm the thesis sustained by Vickerman (1997) that in many cases HSR projects have been promoted, without clear planning and appraisal, exclusively on the basis of a mythical belief that fast trains would be capable of coping with a number of different needs wherever they are built. The demographic and economic conditions that can support a HSR project are indeed very limited and difficult to locate everywhere across the world (Amos et al. 2010). Moreover, even when the construction of a HSR line is considered to be the best solution compared to alternative actions, further issues (exploitation model, the number and the location of the stations, funding mechanism to deliver the project, transport policies to attract traffic etc.) need to be solved according to the features of the territory which the project is conceived for and the public values which have to be secured;
- Embed infrastructure investments within broad and coherent national infrastructure plans and strategies set up for different planning horizons and consequently capable of addressing while linking together short-term, mid-term as well as

long-term goals (see Baghai et al. 1999). Only a stable planning and policy framework may guarantee the creation of a rational and efficient infrastructure system by identifying real priorities between projects with diverse time horizons (on the basis of both qualitative and quantitative analyses), raising the funds to finance their construction (even through the attraction of private capital), ensuring an efficient project delivery and strategically linking these projects together. For instance, the implementation a HSR project should be conceived as an important long-term objective within the overall strategy for the completion a wider railway network. However, in order to maximize and spread the benefit of this new line, investments in the short and medium terms to upgrade and retrofit the conventional railway lines are essential;

- Always examine carefully potential downside scenarios when looking at long term infrastructure investments and consider adequately "low-cost" solutions to deliver a project. Over the years all the documents that have been produced, to support Corridor 5, at European as well as national level, have clearly revealed overoptimistic judgments about the future events. Additionally, the HS/HC model appears a solution excessively costly to implement, especially in areas of low traffic demand (see Beria and Grimaldi 2011). In this respect, the economic and financial crisis of 2008 has already demonstrated clearly how the extrapolations of favourable short-term trends into the future to justify massive but not well-grounded infrastructure investments may have dire consequences (Dimitriou 2009).

Accordingly, as regards the project of Corridor 5 in the northeast of Italy, if on the one hand it is not possible to express any final judgment about its success or failure as it has not been realized yet, on the other hand, there is much evidence to suggest a reframing of it. More precisely, if the section of the Mediterranean Corridor between Venice and Trieste will continue to be considered effectively a "strategic" infrastructure investment, a deep investigation on its real raison d'être, its physical boundaries and interdependency relationships with other infrastructure projects and other associate developments, the global as well as the local impacts it is anticipated to have and the new targets required to suit emerging circumstances (credit crunch, new transport patterns, new stakeholders' agendas, etc.) are only some of the essential requisites to increase the possibilities of successful performances. On the contrary, without this turning point, this HS/HC railway axis, once realized, is likely to become a "white elephant".

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Chapter 3
Mega Transport Infrastructure Differentiation Along the Mediterranean Corridor

Lara Brunello

To offer a reading key to current changes in the field of major transport infrastructure projects, this chapter analyses the development of the Mediterranean Corridor from its conceptual origins to its latest configuration. In doing so, a few criticalities will be highlighted and some local experiences presented as case studies to attempt a theoretical inference. These experiences were collected through the Poly5 project within the Alpine Space Programme and will be more thoroughly reported by the interested territorial partners in the second part of this book.

3.1 Introduction

Mega transport infrastructure projects (MTIPs) are complex entities with long lifespans, combined with multiple variables and actors, making contingencies as well as financial, political, social and technical changes likely to happen. Furthermore, failing performance records of many such projects have undermined public confidence in the potential socioeconomic benefits. To complicate matters, the recent global financial crisis has largely impacted on the economic feasibility of many projects, forcing decision-makers to revise priorities and focus on more viable plans and programmes within medium-short terms. Thus, more than ever, under a general scenario of uncertainty, MTIPs have become critical entities entailing problems and risks beyond their already high level of complexity. This condition has serious consequences for all related interactions in terms of material and immaterial flows, vertical and horizontal relationships, and in terms of development phase, affecting scenarios at all levels, from the macro to the micro and vice-versa.

However, whether complexities might partly derive from the complicatedness of the infrastructure itself and partly from the uncertainty of the project development cycle (Priemus 2010; Bertolini and Salet 2008; Flyvbjerg et al. 2003), criticalities might also be chiefly linked to the world around and to circumstances beyond

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the project itself (Priemus et al. 2013; see also Chap. 2). This means that MTIPs would need to be considered not as separate entities to be superimposed on land but as living organisms, which necessarily need to be rooted in the territory to be able to thrive. Thus, it appears as if major transport infrastrucutres tend to become open systems, more dynamic in their evolution and bearing systemic ramifications. Such an open approach is looming paradoxically from the ashes of a severe economic downturn, which reduced available resources and flattened optimism. This approach points toward more cautious and incremental modalities of deciding and implementing MTIPs, providing the occasion to develop frameworks of good governance, transparency and public participation in policy-making (Innes and Booher 2010).

In this chapter, the essential steps in the evolution of European corridors will be traced from the macro level downward, narrowing the focus on high-speed rail (HSR) projects, to argue how a negative myth has grown out of a series of misconceptions regarding European transport guidelines, misinterpreted by Italian authorities as untouchable and inflexible to specific territorial conditions. Things are changing, and local experiences teach that integrated projects are possible. Thus, particular attention is paid to the search of more territorially adaptive solutions to allow MTIPs to enlarge possibilities for the traversed territory.

3.2 Background

Since the Treaty of Rome (1957), which proclaimed a "common transport area", and more so since the fall of the Berlin wall and reunification of the Federal Republic of Germany (1989–1990), the European unifying thrust became impellent, especially for the transport policies and systems.

Once established the European Union (Maastricht Treaty, 1992), two fundamental policy schemes were adopted: (i) the Pan-European corridor strategy, with the intent to develop essential axes to integrate newly annexed Eastern countries within the larger Europe and (ii) the Trans-European Transport Network (TEN-T) strategy, with the intent to enhance connectivity within the Union through the development of a network of priority projects.

The first scheme was determined during three Pan-European Transport Conferences held in Prague (29–31 October 1991), Crete (14–16 March 1994) and Helsinki (23–25 June 1997) with the purpose to identify transportation needs of Eastern countries and to integrate networks within the larger Europe. These conferences confirmed a corridor approach as the main strategy to expedite the development of transport routes throughout Europe and to ease international trade (EP and EC 1991). Out of ten fundamental corridors (Fig. 3.1), Corridor 5 was the forerunner of the current Mediterranean Corridor. Its layout was first outlined as an axis between Trieste and Kiev, unravelling through Italy, Slovenia, Hungary and with two branches going from Bratislava to Uzghorod in Slovakia and from Budapest to

Fig. 3.1 Map of the ten Pan-European corridors as in 1997. (Source: Wikimedia Commons 2009)

Rjieka in Croatia. This configuration was then redefined as an axis extending westwardly from Trieste to Venice and with a further branch from Budapest to Ploce, running through Bosnia–Herzegovina. This addition in particular was meant to support the restoration of strategic connections, which had been damaged during the Yugoslav Wars (1991–1995).

The second scheme derives from a list of 14 priority projects defined by the European Council in Essen (9–10 December 1994). Most of these projects were

Fig. 3.2 Map of the TEN-T priority project n. 6 extension in 2004. (Source: EU INEA 2013a)

HSR, among which priority project n. 6 (PP6) was meant to connect Lyon to Trieste. The Essen list formed the foundation of the community guidelines on transport, the TEN-T, when the European Parliament endorsed it with Decision 1692/96/EC on 23 July 1996 (EP 1996). Since then, particular attention and substantial funding was invested on the improvement of railways; however, only at the end of 2003, the European Conference of Ministers of Transport gave a definition for the Essen list as a "network of priority projects" (ECMT 2003). Soon after, the TEN-T was expanded to 30 priority projects with Decision 884/2004/EC on 29 April 2004 (EP 2004). This decision followed the recommendations of the Van Miert high-level group, which collected and evaluated proposals of member states and entering countries for transport projects having a networking relevance up to 2020 (Van Miert 2003). On that occasion, PP6 was extended eastwardly to the Ukrainian border, linking Divac, Koper, Ljubljana and Budapest (Fig. 3.2).

The extension of PP6, partially overlapping Corridor 5, gave rise to two major consequences. On the one side, it encouraged corridor realization thanks to a 50% European cofinancing for border sections. In this, TEN-T policies have been essential for the evolution of European corridors explicating the Union' strategic mission to revitalize railways in view of a more sustainable development through priority projects fostering competition, modernization and interoperability (e.g.

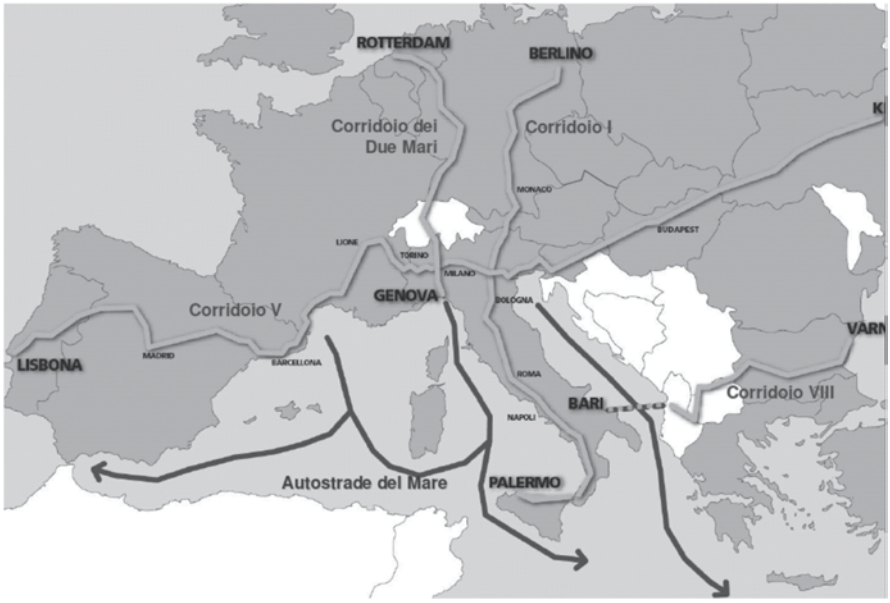

Fig. 3.3 Misrepresentation of Pan-European Corridor 5 since 2004. (Source: MIT 2007)

third railway package, Directive 96/48/EC (EC 1996) and similar). However, on the other side, it created the occasion for confusion and mismatching of the two fundamental policy schemes promoted at the European level.

Misunderstandings went as far as extending the vision of Corridor 5 all the way along PP6 and beyond, westwardly. So that Italy in particular, and neighbouring countries by reflection, believed that Corridor 5 originated in Lisbon and terminated at Kiev, passing through Lyon and Trieste. However, not one official European document ever asserted so. This belief is attributable to the words of the former Italian Minister of Infrastructure and Transport Mr. Lunardi, in his inaugural speech to welcome the establishment of Corridor 5 Permanent Secretariat (C5PS) in Trieste on 27 January 2004 (ASCA 2004). On that occasion, Corridor 5 was presented as one of the longest axis throughout Europe, apparently to enhance the strategic position of Italy as a bridge between the Eastern and Western Europe. This vision was strongly advocated by contemporary political thought, in particular Mr. De Michelis, deputee at European Parliament from 2004 to 2009, who stressed on the geopolitical importance of connecting Western Europe to the new eastern frontier (De Michelis 2003). It has to be noted also that, at that time, the presidency of the Council of the European Union had just been held by the Italian Government (July–December 2003) with the faculty to determine agendas and set work programmes. So, since 2004, a powerful vision was created from the misrepresentation of Corridor 5 and it has long lived thereafter (Fig. 3.3).

3.3 The Mediterranean Corridor

As seen above, for the increasing number of priority projects or the overlapping of priority sections on many corridors, confusion and difficulties flourished to clearly distinguish concepts and strategies in reference to the European transport policies.

Furthermore, it seems that even the recent global financial crisis impacted on European plans, putting on hold works on many MTIPs. Certainly, a revision was necessary to adjust budgets to performance. Thus, to uphold the future of connectivity within the European Union, the Commission had to reduce and simplify its transport policies.

Initiated on 19 October 2011 with a proposal by the European Commission (EC 2011a), the process to review the European transport policies reached its final approval by the European Parliament on 27 November 2013 (EP 2013). This revision, namely "Connecting Europe Facility" (CEF), essentially consists of a dual layer approach, comprising a "core network" made at first of ten (EC 2011b), then only nine, priority corridors (Fig. 3.4), to be completed by 2030, and supported by a "comprehensive network" of minor connections to be completed by 2050. Thus, the core network will be fed by this comprehensive network, ensuring greater accessibility of all the European regions. The aim would be to allow the great majority of Europe's citizens and businesses to access the comprehensive network within 30 min travel time (EC 2013).

During the span of 2 years from the proposal to the approval of such a radical revision, not only the layout of the TEN-T was redesigned but also the financial budget underwent important alterations. On 18 December 2012, the European Parliament endorsed the European Commission's proposal, but with strict allowances for priorities and delayed spares for the rest (EP 2012). From that preliminary austerity, available funding has tripled to an overall 26.3 billion € for the period 2014–2020 (EP 2013), probably following Keynesian thoughts where recovery from a major crisis is possible mainly through large public investments (Krugman 2011). The European funding is particularly intended for the core network, having a greater added value and the expected outcome of such a proficient financial budget is that it would especially act as a "seed capital" to stimulate further investment by the member states to complete difficult cross-border connections and links which might not otherwise get built. The total cost of implementing the core network for the period 2014–2020 is estimated at 250 billion € (EP 2013).

While the initial 2011 proposal seemed to prioritize corridors within the core network and a newly added Baltic–Adriatic Corridor seemed to shift these priorities toward north–south relations (EC 2011b), the final 2013 approval stresses on the importance of east–west connections, ring-fencing almost half the total funding for cohesion countries. Thus, with only two north–south corridors and four diagonal corridors, the core network sees the Mediterranean Corridor as one out of the three major east–west European corridors.

The newest CEF policy could be interpreted as the outcome of a process to unify the two major transport policy schemes: the Pan-European corridors on the one

Fig. 3.4 Map of the new TENT-T core network corridors. (Source: EU INEA 2013b)

hand and the TEN-T priority projects on the other hand. In particular, the Mediterranean Corridor's layout appears to be shaped on the former Pan-European Corridor 5 and several priority projects, such as PP6 Lyon–Budapest, which includes two major cross-border sections (France–Italy and Italy–Slovenia) and PP16 Algeciras–Paris, which includes the French–Spanish cross-border section (Fig. 3.5).

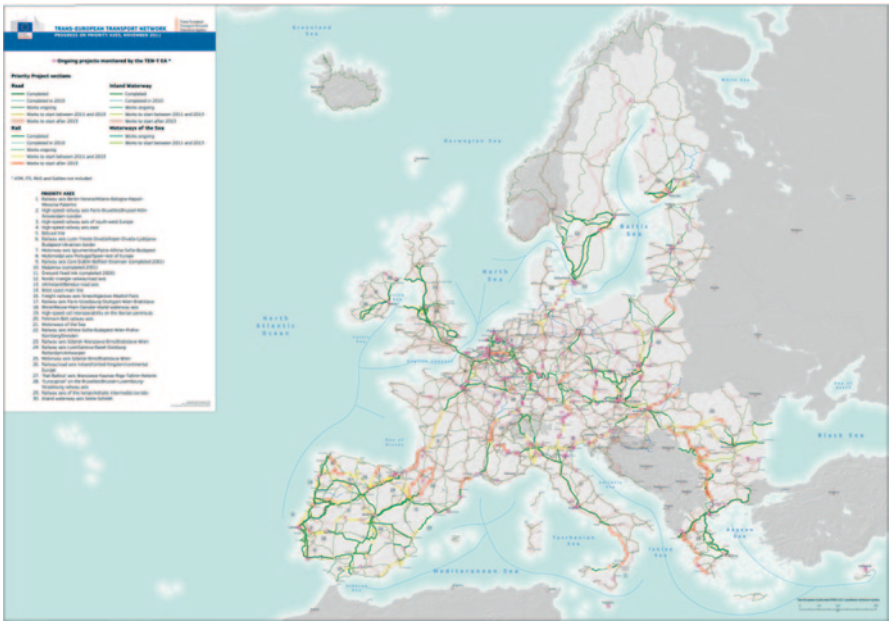

Fig. 3.5 Map of the 30 TEN-T priority projects. (Source: EU INEA 2012)

3.4 The Mediterranean Corridor's Critical Areas

Along the Mediterranean Corridor there are several cross-border sections. In Italy, the two major cross-border sections, the Lyon–Turin and the Venice–Ljubljana railway links, were defined in 2005, when PP6 was divided into five independent sections by the first project coordinator, Ms Loyola de Palacio. The subdivision was meant to better coordinate the project, providing each section with its own financial budget and a separate timetable. However, this subdivision soon revealed several criticalities, and particularly those cross-border sections, especially over Alpine areas, present difficult managerial and technical complexities with high construction costs and socio-environmental risks.

These two cross-border sections have been the focus of the Poly5 project, within the Alpine Space Programme, which selected areas on the following criteria: (i) located in the Alpine contexts; (ii) having transnational influences; and (iii) traversed by large infrastructural corridors. Selected areas are cross-border regions at the intersections of the Mediterranean Corridor and the Alps. So, case studies have been fairly divided into two macro areas, the Western Alps and the Eastern Alps (Fig. 3.6).

However, these areas are not homogeneous, but somewhat representative of a rich variety of territorial structures. They include different territorial realities, which go from the narrow valleys of Savoie to the metropolitan area of Turin, from the

Fig. 3.6 Western and Eastern Alpine case study areas. (Source: Fabbro and Brunello 2012 (elaboration on Google background))

sprawling urbanization of more densely populated Veneto or less densely populated Friuli–Venetia–Julia to the rural agglomerations of Western Slovenia, up to the urban polarization around the city of Ljubljana.

Case study areas on the Western Alps have been represented by institutions, such as the General Board of Savoie and the Province of Turin, bringing to the table both planning and implementation of mature experiences. Case study areas on the Eastern Alps have brought less defined and more uncertain experiences, often characterized by cautious approaches (see Chap. 15), apparently to avoid fuelling hostility toward the HSR projects, as it happened on the Western Alps.

These case studies have been analysed to investigate the liaison existing, or that might be built, between territories and large infrastructures. The relationship may not only bring potential opportunities but also significant threats. Thus, case studies have been examined as dynamic configurations of spatial and temporal intermediate scenarios between two extreme scenarios. These extremes are constituted by the current situation and the expected 2030 situation, where the core network is assumed to be realized and fully operative.

In the framework of the Poly5 project, these dynamic configurations have been devised at the University of Udine through a Territorial Knowledge Sharing System (Fabbro and Brunello 2012 and explained in Chap. 10). The current situation was modelled by the Transpadana–Trenco partnership, highlighting the difficulties of crossing the Alps. On the Western Alps, the alternative to the yet-to-be Fréjus tunnel is a northern passage through the Gotthard or the Loetschberg–Sempione tunnels along the Rhine–Alpine Corridor. On the Eastern Alps, there are not as many alternatives to a far future tunnelling of the Karst. The Brenner Base tunnel

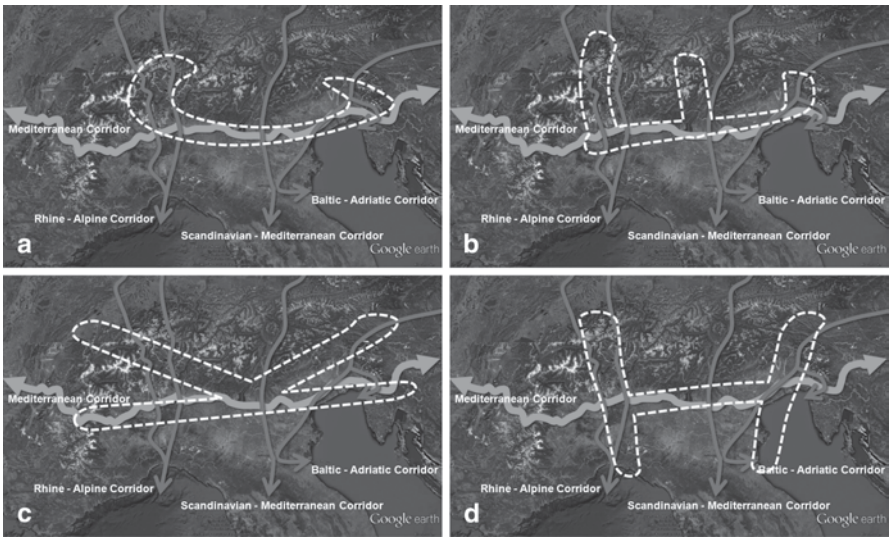

Fig. 3.7 Abacus of provisional network configurations. **a** U-shaped. **b** E-shaped. **c** K-shaped. **d** H-shaped. (Source: Fabbro and Brunello 2012 (elaboration on Google background))

is underway along the Scandinavian–Mediterranean Corridor, but it will take time before completion and Germany appears to fall behind schedule in access works (see Chap. 7). Austria, on the contrary, is working hard to ease bottlenecks along the Baltic–Adriatic Corridor, building the Koralm railway and the Semmering tunnel (see Chap. 16).

Therefore, it is likely that the distribution of traffic flows would adjust along existing routes and progressively along those coming into realization sooner than others. So, notwithstanding the Mediterranean Corridor to be one of the most important east–west routes in Southern Europe, it is possible that, in the medium-short term, flows would shape a provisional network in relation to the implementation of development of the involved corridors.

Four main provisional network configurations (Fig. 3.7) have been taken into consideration: (1) U-shaped, when flows on the Mediterranean Corridor would bend northwardly toward the Rhine–Alpine and Baltic–Adriatic corridors; (2) E-shaped, when the Brenner Base tunnel would be operative; (3) K-shaped, when eastern and western passages would open up along the Mediterranean Corridor; and (4) H-shaped, when access to the North Tyrrhenian and North Adriatic ports would be completed.

It is to be noted that these configurations are not part of plans or programmes, but help to understand how priority given to some interventions might affect spatial aspects and territorial organization of involved areas. These potential effects are briefly summarized below:

- U-shaped configuration: Germany appears as the economic engine of Central Europe and Northern Italy works as its southern appendix with little autonomy. Strengths reside in the well-developed infrastructure and important traffic flows,

especially on the northwestern Alpine Arc, with significant rail-mode share. However, threats entail marginalization risks for the rest of Italy and its Eastern and Western neighbouring countries.

- E-shaped configuration: Northern Italy appears integrated into Central Europe with a strong link to Bavaria in Southern Germany. Strengths come from a balance of the east–west and north–south flows in Verona, already equipped as an intermodal transport and service hub. However, a weakness is to remain dependent on the European economic engine.
- K-shaped configuration: Northern Italy opens up to eastern and western connections. Strengths derive from the potentialities to attract eastern traffics, which currently tend to flow northwardly toward the Danube region. However, high-speed rail deployment is projected in a long-term timeframe (unless creatively looking into new solutions, such as upgrading existing infrastructures and offering metropolitan rail services).
- H-shaped configuration: Two well-connected gateways on the Mediterranean Sea constitute an anchor for the whole Europe toward new functional and commercial relations. Strengths reside in the power to move balances from the Northern Sea toward the Mediterranean Sea, bringing the whole Alpine region into a new position not only at the European, but also at the global level. However, bottlenecks in the Genoa hinterland and low capacity, inefficiencies and scarce cooperation of the North Adriatic ports make this scenario difficult to realize.

3.5 Local Experiences to Differentiate MTIPs

Through the impact analysis of territorial effects deriving from the provisional network configurations and due to high socio-environmental risks, it became evident that case study areas were compelled to conceptualize alternatives to the standard top-down approach to corridor realization and in some cases even to the foreseen HSR model. Two experiences in particular are significant to our discussion and briefly reported below.

The experience brought by the Province of Turin (see Chap. 14) informs about the process for the realization of the new Lyon–Turin line and the work done by the Observatory, a governmental body purposely established to manage the project in view of difficult social unrest arising against HSR.

The experience teaches that there could be different approaches to complete the design of a corridor not only in terms of mitigating infrastructure impacts on the territory by decreasing project speeds (i.e. reducing HSR requirements) and by evaluating several alternative layouts, but also and foremost by an incremental approach subdividing works in functional phases. These phases could be realized independently and each parcel could maximize the advantages connected with the infrastructure while reducing initial investments and enhancing economic feasibility. Even a step-by-step planning approach could allow the project to become more suited to the territory and, with participation of local communities, more coherent in a process of reciprocal valorization, allowing the implementation of spatial strategies

as those proposed in the French town of St.-Jean-de-Maurienne and in the Italian city of Susa (see Chap. 12). Those strategies are based on the realization of two new rail stations, respectively, at the entrance and at the egress of the Fréjus tunnel, and aim at their territorial integration (e.g. through a direct connection to the mountains and the village thanks to a calbe car). In particular, the realization of those stations would be eased through the spatial strategies and would allow the opening up of possibilities for the area to be served by HSR stopping service or other local service. This changes the logic of the whole Lyon–Turin line, generating effects on the role and functions of railways over the trans-Alpine areas. In fact, infrastructures offer the possibility of running a service, but it is the service that makes a real difference and the relatively modest distance between these stations provides enhanced accessibility and new means to reap opportunites in a cross-border Alpine context.

Another significant experience is brought by the Province of Gorizia and the Municipality of Sempeter–Vrtojba (Chap. 18) and deals with the ADRIA A project to realize a metro rail transit system in the cross-border area between Venice and Ljubljana. This project is not officially promoted as an alternative to the Mediterranean Corridor development, but only as an off-the-shelf solution with the least investment that might be realized in a short timeframe. Unleashed from the European corridor design, this project has the freedom to develop something apart from an HSR model and more suited to the local needs. Thus, an alternative technology (i.e. a metro system) would provide the desired service in a cross-border area and potentially allow connection between airports and seaports without solution of continuity. Supposedly, the service might also include freight. In this way, focussing on a smaller scale and confronting local interests, the ADRIA A project could become an infrastructural node with hinge functions, a sort of distributive, flexible and accessible node. In other words, it could become a genuine territorial project.

3.6 Discussion

European transport policies, based on an array of 10 Pan-European corridors and 30 TEN-T priority projects, had been overly ambitious, scarcely discussed at the national level and poorly articulated at the regional and local levels. Especially, for the case of PP6 and former Corridor 5 as seen in the background section, the confusion between policies left enough room for the creation of a misleading vision with severe consequences:

- The rhetorical metamorphosis of PP6 into Corridor 5 has had the destructive effect of transferring a project pertinent feasibility valence to a corridor which had not even been planned as such. Thus, a series of paradoxes were generated and could not be dealt with, having bypassed necessary and adequate planning steps.
- Especially, the scarce planning and insufficient knowledge on cross-border areas has produced simplistic and very expensive solutions, evident in the preliminary project proposals, which were economically and environmentally unsustainable (e.g. tunnelling through the Karst).

- The extension of project specifications over the entire length of a several thousand kilometres long corridor placed an overstated significance on a predetermined technology (e.g. HSR), while neglecting spatial and typological alternatives in accordance with territorial vocations.

The basic assumption questioned here is that a corridor cannot be defined a priori as a uniform entity on a predetermined layout or with specific technical solutions.

In particular, following the reasoning of transport economist Ponti (2003), corridors are rarely travelled in their full length. Especially ground transport is very scant over extremely long distances. In such cases, passengers usually opt for air travel and goods are shipped.

More often a corridor could be seen as a bead necklace made up of a series of intersecting catchment areas, with traffic volumes varying significantly from area to area. In Italy, 65 % of the revenues in the logistics chain are produced at the local–regional level (MIT 2012). This means that there is a predominance of road trips made on medium-short distances.

However, identifying Corridor 5 with PP6 has locked project requirements in the corridor, and blurring differences between the two main European policy schemes made many in Italy lose sight of the specific role of corridors as routes of European interest, as priority projects could also be horizontal projects, such as the European Rail Traffic Management System (ERTMS) for the interoperability of networks.

This discrepancy has been certainly noticed at the higher administrative levels and it made evident that a revision was necessary for the redefinition and integration of corridors and priority projects. In effect, things changed with the recent TEN-T revision. This review, introducing new corridors and adjusting existing ones on actual development, highlighted the inherent flexibility of policy schemes and the unavoidable need for feedback between macro and micro levels. In the past, this elasticity at the macro level has been scantily translated downwards, so that national policies have been defiant of the real meaning and aims of the European schemes.

Thus, it now appears as if recent changes have created the opportunities for micro-level changes to be incorporated at higher levels, so that the newest CEF strategy could be interpreted as the unification of the Pan-European corridors and the TEN-T priority projects policy schemes. Most importantly, this policy revision demonstrated that corridors are not structures given a priori, but they are the product of a rich and complex evolution, which could have many forward and a few backward moves allowing for adaptation. It is now clear that the European schemes remain a framework that needs completion at the national and regional levels to be filled with content and meaning. Thus, it is also essential to acknowledge that this frame allows a good degree of freedom to be interpreted by local territories.

This territorial interpretation of transport policy schemes could translate the MTIPs with a discrete, not uniform, approach. Thus, a corridor might be deconstructed and reconstructed (see Fabbro's introduction) to enhance the difference between the beads it is formed with. While granting the interconnection of links as in a necklace, there might be three categories of differentiation that could take place along a corridor, as learned from the experience reported by the Poly5 project:

- Spatial changes, depending on layout positioning in regard to local needs, characteristics and environmental qualities
- Temporal changes, depending on the subdivision into functional phases to reduce initial investments and to offer services long before completion of the whole project
- Typological changes, depending on the technical solutions adopted as placeholders to future technologies or as adaptation to a difficult local context

It needs to be noted that these categories of differentiation are not fully acknowledged or reflected in planning tools. Indeed, spatial changes are often the result of a revision made necessary by public turmoil, as in the case of the Observatory for the new Lyon–Turin line. They rarely are an appreciated part of an ex-ante process of project evaluation, as required by the French legislation (see Chap. 13).

Temporal changes were introduced by the infrastructure contractor for the Lyon–Turin line to subdivide investments in functional phases in 2011 (LTF 2013). The suggestion came from the Intergovernmental Commission, purposely established to manage the cross-border section.

Typological changes are even further back in line, not admitted as such by the very same promoters. Specifically speaking of HSR and since infrastructure and technology requirements depend on the operative model choice, it is important to understand that not one, but several models exist to operate the HSR (Campos and de Rus 2009). However, few distinguish between infrastructure and services. In Italy as in England, HSR has been misconceived not only by blurring the difference between passenger transport and freight transport, but also misinterpreting territorial characteristics and specificities. Obviously, spatial contexts weigh greatly on the operative model and should be considered in the choice (Vuchic 2007). As an example, whereas freight services might uphold the regional economy in non-metropolitan areas, HSR services might not gain enough patronage in such areas (see Chap. 17). However, alternative systems might act as effective platforms for both mobility and transport needs in rural or polycentric areas. Eventually and opportunely connecting these "interface systems" (Brunello 2011) as feeders to HSR lines would fulfil the European objectives without imposing inadequate operative models in territories with high risks or delicate environments. Thus, the implementation of an MTIP could be conceived as part of an overall strategy, which would necessarily include investments on their territorial interpretation with spatial, temporal and typological differentiation.

3.7 Conclusion

The recent downturn has shed new light on MTIPs and awakened the public and decision-makers from a long period of economic bonanza to refocus spending and to review plans and programmes. So, economic–financial contingencies as well as bottom-up pressures are reshaping the implementation of the European transport

policies by diversifying outcomes in terms of layout, implementation timings and system typology. More adaptive projects, better integrated and with less impacts even on public finances, seem to count most during uncertain times.

The resizing of the European transport policies and the reframing of priorities through a new definition of core and comprehensive networks appears a clear example of this need to change. However, evidence shows how changes at the local level seem to have been influenced more by those contingencies and pressures than induced by high-level plans and programmes. This situation could open discussion on the reciprocal influence between the macro and the micro levels. However, it is very difficult to tackle problems of connectivity, accessibility and economic development of territories without adequate integration of these issues in European, national and regional policies. This would be a major research area for further investigation, especially in consideration of emerging solutions at the regional–local levels to be reflected at higher administrative and planning levels.

A corridor that traverses different spatial contexts, ranging from the Alpine cross-border areas to the metropolitan areas of Turin and Ljubljana, up to the widespread polycentric networks of small and medium-sized cities in northeastern Italy, cannot be evenly and uniformly designed to a single model of HSR standards. Due to these non-homogeneous areas, MTIPs differentiation is essential in accordance with regional–local structures, adaptive technological solutions, available budgets and timing to ensure the territorial compatibility of infrastructures. Therefore, it is clear that territorial integration of large infrastructures would undergo a less mechanistic and more organic interpretation of the relationship between infrastructures and territories through more sound spatial, temporal and typological differentiation. Thus, shifting the focus from mere infrastructure toward a broader vision of the territorial changes that a community (at the European, national or regional level) might prefigure, it would be applicable for the MTIPs to adapt to territories in a mutual exchange of opportunities as well as values.

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Chapter 4
Influence on Spatial Development by Building TEN Networks in Slovenia

Samo Drobne, Mojca Foški and Alma Zavodnik Lamovšek

4.1 Introduction

Slovenia is one of the most polycentric countries in Europe (ESPON 1.1.1 2004), and its territorial development is subject to the determination of the location of transport infrastructure. In 2006, Slovenia adopted the Resolution on the Transport Policy of the Republic of Slovenia; by taking into consideration the Slovenian strategic documents and the European Union (EU) recommendation for sustainable mobility, its focus has been the development of transport infrastructure on the one hand, and, on the other hand, integrated public transport solutions concerning the intermodality of public transport services, bus stops and terminals (ESPON TANGO 2011–2014). In 2008, the Operational Programme of Environmental and Transport Infrastructure Development for the Period 2007–2013 (OP ROPI) was adopted. This is the basis for drawing funds from the Cohesion Fund and, to a smaller degree, funds from the European Regional Development Fund. As it is clear from the name of the operational programme, its major focus is the improvement of infrastructure in Slovenia.

However, the situation in the construction of infrastructure networks worsened since 2008 with the onset of the great economic crisis and the suspension of many investments. Recent national documents, many of which are still being drafted, suggest that the trend will be continued, not only for the road network but for all transport networks. The construction of many (badly) needed infrastructures has been held back or set off for several years if not to the indefinite future, that is, a decade or more (Osnutek resolucije o nacionalnem programu razvoja prometa in prometne infrastructure v RS 2014).

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Accordingly, the Spatial Development Strategy of Slovenia (SPRS 2004), which is the most important document of Slovenian spatial development, outlines the orientations of transport infrastructure development. First, the national road network structure is shown, indicating the major connections between centres of cross-border, international and national significance with international—European—and cross-border areas. In the plan, Slovenia is connected to the European territory through the former Pan-European transport Corridors 5 and 10. To this end, the Slovenian Motorway Cross was built on the east–west (Corridor 5) and north–south (Corridor 10) axes. The major goal of the motorway cross was not only Slovenia's international connection but also the assurance of a balanced regional development, as the motorway cross is intended for both regional traffic and improvement of connections between small and medium-sized towns. In this sense, motorway connections were planned not only in relation to traffic efficiency but also in view of the territorial development goals of individual towns and cities. Here, local communities (municipalities) play a significant role as they possess original competence for spatial planning on their territory. In siting major infrastructure facilities (such as motorways, hydropower plants, railways and wind plants), the state and the municipalities must collaborate closely, with a particular focus on engagement and communication with the public. Social acceptability, that is acceptability in the local context, is one of the aspects to be considered in the planning of these facilities (ZUPUDPP 2010; ZPNačrt 2007).

In Slovenia, the significance of the local community is all the more pronounced because the regions are not established at the administrative level, but, instead, the so-called statistical regions at the NUTS3 level were introduced, ensuring the collection of statistical data and correlated research activities. Since 2000, regional development agencies have been established at the level of statistical regions. Irrespective of their status, which is indeed not institutionalized, they often undertake the liaison role between local communities and the state. They particularly help local communities in operation management, project implementation, fundraising, etc. Hence, the planning initiatives concerning infrastructure facilities may either be directed top-down, that is from the state level, or bottom-up, that is from various associations, the economy, non-governmental organizations, civic initiatives and other stakeholders.

The development of the railway network is also in line with European and Slovenian development documents directed at facilitating access to the new European core network corridors, in particular the Mediterranean and Baltic–Adriatic corridors, which could be interpreted, at least in Slovenia, as replacements of former Pan-European transport Corridors 5 and 10 and which could be realized through the reconstruction and completion of railway connections of international significance. The completion of a more efficient Koper–Divača long-distance connection of international importance is also envisaged with the doubling of the existing railway, called the Second Railway Track project. Other transport nodes of international importance are also connected to high-speed links within the frame of the cited Pan-European corridors (e.g. Pivka and Zidani Most). Similar to the road network,

the railway network is hierarch`ically structured and ensures connectivity and accessibility to the centres at all levels. The connections between economic zones in Slovenia and neighbouring countries are particularly important.

The focus of this chapter is the analysis of road and, to some extent, railway infrastructure and transport in Slovenia; however, their close connection to the Port of Koper is too important not to address. The Port of Koper is the only Slovenian port for freight and passenger transport, which accounts for over 90 % of total overseas transport; however, the port offers poor transport connections to the hinterland of Central and Eastern Europe. Only by building state-of-the-art road and railway infrastructure will the Port of Koper be able to efficiently connect with its hinterland and the Port of Trieste. Over the next few years, the building of the Second Railway Track is envisaged, with the possibility of connecting to the new high-speed Venice–Ljubljana rail line.

The aim of this chapter is to provide insight into the effects of connecting the Slovenian transport network to the Mediterranean and Baltic–Adriatic corridors on the spatial development of Slovenia and territorial cohesion at both international and national levels. Here, we focus on the impact of both European corridors to improve territorial cohesion from the aspects of quality, efficiency and assuring spatial identity (ESPON 3.2. 2006), with a minor focus on the institutional framework and capacity to introduce change and impact the decision-making on all levels of spatial planning.

4.2 Methodological Framework

In establishing the effect of transport infrastructure on the spatial development of Slovenia, we first outlined the starting points that helped us to elaborate the methodological approach used in the evaluation. These starting points are related to:

- Compliance of transport infrastructure development with the goals of SPRS (2004) and the ways of drawing funds from the Cohesion Fund, as set out by OP ROPI (2008).[1]
- The distinction between international and national levels in the evaluation of the Slovenian transport network where successful territorial cohesion can only be achieved by taking into account the development of activities on the local level and the integration of local and regional centres into the urban network on the national level.
- The recognized territorial situation that represents the starting point for evaluating the adequacy of transport infrastructure.

[1] As discussed in the Introduction, the new documents are still being drafted; so we relied on the existing and applicable SPRS (2004) and OP ROPI (2008), irrespective of the global financial crisis.

- Elaborated spatial models and simulations showing the future state of the transport network after the completion of the projects in compliance with OP ROPI (2008).
- Problems with evaluation due to the poor quality of data (less adequate or outdated data) or the lack of spatial data. Due to fast territorial changes, the data change quickly and are not always readily available.

In continuation, our focus was the evaluation of the adequacy of transport networks in relation to the goals of SPRS (2004), OP ROPI (2008) and territorial cohesion (Green Paper on Territorial Cohesion 2008). Territorial cohesion is often seen as the spatial dimension of sustainable development (ESPON 3.2. 2006), connecting the economic, social and environmental aspects (Camagni 2005 in ESPON 3.2. 2006). The territorial dimension depends on the structured, environment-friendly and efficient (with respect to the utilization of natural resources) territorial distribution of human activities. The territorial dimension can be expressed as (ESPON 3.2. 2006):

- *Territorial quality* as a triad of visual attractiveness, functionality and quality of living. This is a prerequisite for attractiveness for the immigration of people as identity carriers, who make an area attractive for investments (Town-net 2005 in Radej 2008).
- *Territorial efficiency,* which represents the relationship between effects and costs, using the categories that are not exclusively economic. Basically, territorial cohesion relates to territorially decentralized and sustainably connected material and non-material factors of spatial planning (Radej 2008).
- *Territorial identity,* which is defined as a goal and a value in itself. No society can do without it, as it comprises its basic fabric. In most cases, it defines the development, as it determines the possibilities of the local production system. This element of spatial cohesion is particularly evident at the local level; at the same time, with multiplicative effects, it stresses on the national identity in the broader European context.

Territorial quality and territorial efficiency are most often related to physical systems in the territorial dimension (Fig. 4.1); they are also expressed in the goals of spatial development (SPRS 2004) and are an important basis of the chosen methodological approach for evaluating the adequacy of the Slovenian transport network related to its impact on Slovenia's spatial development. Along with sociocultural and economic systems, territorial identity is also expressed through physical systems.

In relation to territorial quality, we focused on the types of transport networks and their quality, the ESPON multimodal accessibility index (ESPON 2009), accessibility to vital functions (centres at different levels and accessibility to public services in these centres) and safety (development of public transport), and/or the state of the existing transport infrastructure.

Territorial efficiency was measured by looking at accessibility to workplaces in relation to the labour market, accessibility to areas with structural problems and the possibility of supplying areas depending on the number of inhabitants and attachments and connections of urban centres.

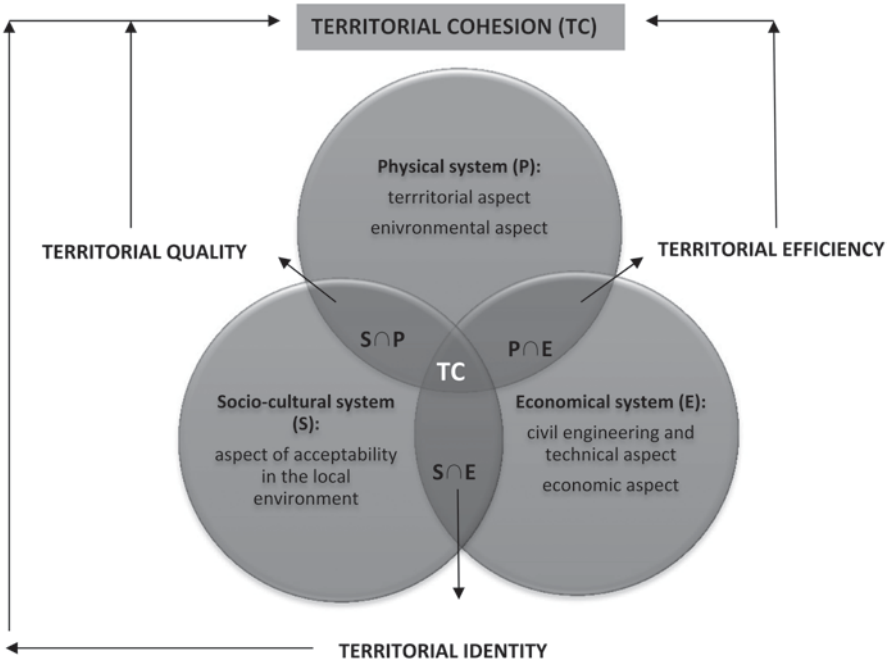

Fig. 4.1 A Venn diagram of territorial cohesion *(TC)* showing the interaction of physical *(P),* sociocultural *(S)* and economic *(E)* systems which are connected into territorial quality, territorial efficiency and territorial identity. (Source: Authors' own elaboration)

Related to territorial identity, physical structures are the least distinct. Territorial identity can be best expressed by accessibility to cultural heritage, natural sites and important tourist sites. However, the results of these analyses fall outside the scope of this study and are not shown in the analytical part.

4.3 Analysis and Results

The ESPON Accessibility Index in Slovenia

The ESPON Multimodal Accessibility Index (ESPON 2009) is based on the measurements of travel time by air, road and railway. For the needs of this study, the potential accessibility at the NUTS 3 level was recalculated by adding together the population in individual regions, which was weighed by travel times to other regions (ESPON 2009; authors' own calculations following the methodological approach by Spiekermann and Wegener 2007). Figure 4.2 shows the Multimodal Accessibility Index in Slovenia and neighbouring countries at the NUTS 3 level in 2001 (100 = EU average).

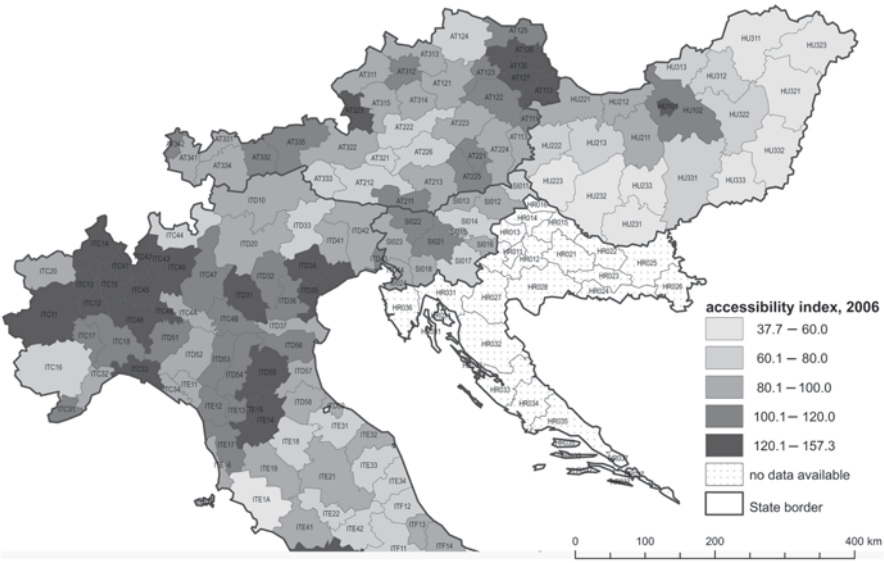

Fig. 4.2 Multimodal Accessibility Index in Slovenia and neighbouring countries at the NUTS 3 level in 2001 (100 = EU average). (Source: Authors' own elaboration with calculations on ESPON 2009 data following Spiekermann and Wegener's method 2007)

The research works (Bogataj and Drobne 2005; Bogataj et al. 2009; Drobne and Bogataj 2005; Drobne et al. 2008) suggest a relatively high correlation between commuters and accessibility at the level of statistical regions and municipalities in Slovenia (p value exceeding 0.80). The analysis of the correlation between the Multimodal Accessibility Index in Europe (ESPON 2009) and the accessibility index in gravitation models of the Slovenian studies mentioned above has, however, shown a relatively weak correlation. Accordingly, in order to examine the investments in infrastructure which improve accessibility at the NUTS 3 level, one needs to distinguish between (a) the national significance of investments and (b) the European significance of investments.

The impact of transport infrastructure on the spatial development of Slovenia should be assessed taking into account two aspects. On the one hand, the assessment should be performed from the viewpoint of integration with European territory and Slovenia's opening up to international territories; on the other hand, of key significance is the assessment from the viewpoint of national development goals that should be directed into internal development, ensuring sustainable and balanced territorial development (territorial cohesion) at the national level. With the construction of the motorway cross, OP ROPI (2008) mostly supported a more internationally open Slovenia, while it was less efficient according to the development goals of the internal road ring that would provide the integration of regional and interurban centres (SPRS 2004). In comparison to OP ROPI, the Spatial Development Strategy of Slovenia is more focused on Slovenia's internal spatial development, the

implementation of which is stipulated by the Spatial Planning Act (ZPNačrt 2007) and, for major infrastructure systems, by the Act Regarding the Siting of Spatial Arrangements of National Significance in Physical Space (ZUPUDPP 2010). Both Acts provide the relevant institutional framework for high-quality and efficient spatial development, following the principles of (a) sustainable spatial development, (b) the public, (c) guidance of spatial development of settlements, (d) overriding of public interest, (e) preservation of distinguishing characteristics of space, (f) inclusion of heritage protection and (g) the principle of expertise. Moreover, both Acts provide for the modalities of cooperation of all stakeholders, particularly the inclusion of the public in spatial planning processes. This allows for the active and transparent role of all stakeholders taking part in spatial development, both on vertical and horizontal levels.

Accessibility to Motorway Connections and Centres with Public Services at Two Levels

This analysis included the modelling of homogeneous impact areas related to 45- and 30-min access to motorway and highway connections as well as centres with both high-level and highest-level public services. The highest level of services was defined as the activities of high courts, hospitals and higher education institutions, while high-level services were associated with other activities of courts, healthcare, high schools and other public activities at regional and local levels (for details see Pogačnik et al. 2009). For this purpose, the area of Slovenia was divided into access impact areas in relation to travel time to individual locations (defined with a raster resolution of 100 × 100 m). The modelling of travel time accessibility on the existing road network was accompanied by simulating the situation after the completion of the Third Development Axis.

The results have shown that the completion of the Third Development Axis will, in some parts of Slovenia, significantly (i.e. by half an hour or more) improve accessibility to the motorway or highway (Fig. 4.3) and to centres of the highest rank. It was also found that the accessibility to high-level centres would not significantly improve despite the completion of a new road as the existing road network ensures good accessibility to these centres.

The results of accessibility modelling clearly suggest that considerable investments into Slovenian transport infrastructure will have to be made in the future. This particularly pertains to the improvement of the railway network, which has not been discussed in the analysis so far, as no significant improvements are envisaged in the near future (OP ROPI 2008). Today, this is also the result of the already mentioned deep economic crisis in Slovenia and elsewhere in Europe and beyond.

With public transport being of paramount importance for a high-quality, efficient and sustainable transport network, it must be mentioned in relation to the development of transport infrastructure. It should operate at intra-urban, inter-urban, interregional and international levels while also providing connections among different

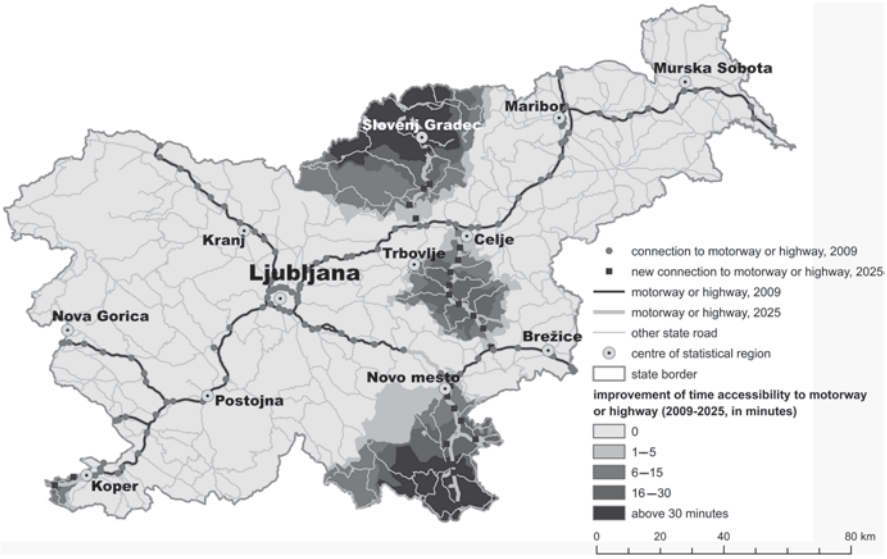

Fig. 4.3 Improvement of time accessibility to motorway or highway connections (after the completion of the Third Development Axis). (Source: Authors' own elaboration)

modes of public transport (road, railway). In this field, the goals of sustainable spatial development in Slovenia have not been met; on the contrary, a step back has been taken as some public transport lines, especially at the interurban level, are being discontinued and/or their service is now less frequent (Zavodnik Lamovšek et al. 2010). This image has markedly improved only in the Ljubljana Urban Region where the City Municipality of Ljubljana and the Regional Development Agency of the Ljubljana Urban Region have completed many projects and programmes aimed at improving transport infrastructure and sustainable mobility (ESPON POLYCE 2012; TURaS 2011–2016). Nevertheless, it is evident that in other Slovenian municipalities, particularly in city municipalities, great efforts are made to improve transport infrastructure and public transport, which proves difficult and financially complex in rural areas, particularly due to dispersed settlement development.

Employment Systems and Functional Regions

In line with EU directives, regional development as a goal of territorial cohesion is focused on the formation of competitive functional regions. This can be supported by an adequate transport network enabling harmonious regional development. Having this in mind, we elaborated a development model (Pogačnik et al. 2009) which highlights the opportunities and comparative advantages of functional areas, dealing with them from the aspect of (beyond) national competitiveness and development efficiency.

Functional areas, which have been based on the high frequency of internal regional economic interactions, combine fast growing modern cities and their functional hinterland. The everyday operation of a modern city has become—due to the different factors among which increasing population mobility is the most prominent—dependent on both the immediate and broader surroundings to such an extent that, for some time now, its development cannot be viewed separately from the development of the wider catchment area.

Functional regions can be formed from either functionally or administratively delineated centres. The centres of statistical or development regions were assumed as administratively delineated centres as in Slovenia there is no administrative level at the regional level. For the analysis we used a method of investigating commuting areas where mobility was calculated in relation to travel by car on the road network. The comparison between the models has clearly shown the locations of strong employment centres and thus stronger commuting flows.

Similar results were obtained by the modelling of functional and (eight theoretically designed) administrative centres that were adopted from somewhat older expert groundwork (MOP 1990). In this case, the poor transport infrastructure of border areas particularly stands out, as most workers commute to the employment centres in the centre of the country or neighbouring countries, while the centres along the border are less developed. There are also no proper internal connections among these areas; this, however, will improve at least in the area of the Third Development Axis.

Commuting Flows

The commuting flows for 2008 (SURS 2010: persons in employment and self-employment, by municipalities of residence and municipalities of workplace, by sex, municipalities, in 2008) only confirm the findings mentioned previously. Commuting flows between municipalities with more than 200 workers (Fig. 4.4) clearly indicate strong levels on the motorway cross, while the analysis of the daily mobility of 50–200 commuters suggests stronger regional transport connections.

Cross-Border Migrations

An analysis of cross-border migrations was conducted in relation to the goal of strengthening cross-border connections and integration with the broader European territory. However, the data on cross-border commuters are only available for 2002 (SURS 2002); there are no more recent data available. The results show the strong connection of Slovenian border areas (municipalities) with the neighbouring countries of Austria, Italy and Croatia. The connections with Hungary are much weaker. The 2002 data (SURS 2002) suggest that the poor connections with Hungary were

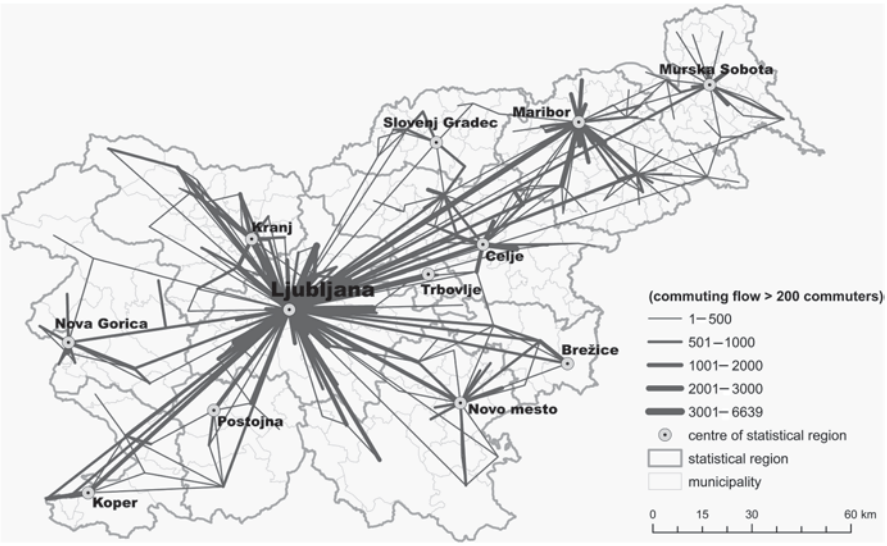

Fig. 4.4 Commuting flows between the municipalities of the Republic of Slovenia in 2008 (only commuting flows with more than 200 commuters). (Source: Authors' own elaboration with calculations on SURS 2010 data)

due to the poor transport connections at the time. It would be extremely interesting to check more recent data; however, they are not available, except at the level of the country as a whole, and thus a thorough analysis cannot be made in this case. The analysis of cross-border commuters can also serve as an illustration of the possible future studies that should be based on high-quality data from the public records of the national statistical office.

4.4 Conclusions and Discussion

The assessment of the impact of the transport network is provided from the viewpoint of territorial cohesion and sustainable spatial development, measured with territorial efficiency, quality and identity (ESPON 3.2. 2006). In relation to the goals of spatial development of Slovenia (SPRS 2004), we designed a methodological approach which provided a representation of the spatial dimension of the existing transport network and the measures envisaged for its improvement (OP ROPI 2008). We took into consideration the Multimodal Accessibility Index (Spiekermann and Wegener 2007), which gives a perspective of Slovenia through the viewpoint of the EU. The results of both analyses differ greatly and suggest a different level of Slovenian regions' and local communities' development. The conclusion drawn from the analysis is twofold: On the one hand, it is necessary to take into account cross-border collaboration and Slovenia's opening up to the EU with connections

to European transport corridors, which in the Alpine Space area seem particularly efficient in the east–west direction between Germany and Austria, and between Italy and Slovenia and onwards to Croatia (POLY5 2011–2014); on the other hand, Slovenia must follow the goals of internal development and increase of territorial cohesion at the national level. To this end, the development of the national road ring is particularly important, ensuring connectivity among regional and interurban centres; the other important part is the development of the border (road) transport ring, which would enable access to the less developed areas along the border and their integration with the central part of the country.

Even if in transport infrastructure the completion of the Slovenian motorway network has been achieved, there are still some unfulfilled goals (SPRS 2004) that must be addressed in order to ensure sustainable spatial development and territorial cohesion as defined in the Green Paper on Territorial Cohesion (2008). The existing development of transport infrastructure, focused on the motorway cross, is strengthening the gravitational role of large urban centres while neglecting some regional development centres, which will ensure their polycentric position in the future. Moreover, it encourages the densification of urbanization in the corridors of the motorway cross, dispersed housing in the wider city areas and the emptying of extensive areas, which are, even after the completion of the motorway system, unaffected by the gravitational effect of regional centres.

Nevertheless, the completion of the motorway cross and the connection to the former Pan-European Transport Corridors 5 and 10 partly enabled the realization of internal regional connections in the country, increased road transport safety and reduced travel costs—expanding the capabilities of economic competition and the inclusion of Slovenia in the European economic area. Also, railway infrastructure is an important factor of environmental and territorial preservation, particularly considering the increasing road traffic and thanks to Slovenia's transitional position. So far, the proposals have included renovation and completion of the existing lines and, specifically, the construction of the doubling of the Koper–Divača line, which would enable higher transport fluidity and competitiveness of the Port of Koper.

More attention will have to be paid to the supply of missing links and completion of existing regional and local transport (road and railway) connections, which are the basis of integrated regional development; yet, due to the development of large infrastructure projects, they are lagging behind. The development of transport terminals for the combined transport of freight and passengers at the international (e.g. Ljubljana, Koper and Maribor) and regional levels is also lagging behind the needs, expectations and goals. By connecting all transport systems, public transport could be improved to ensure the highest possible level of the urban network and accessibility to different activities and services, particularly those of public significance. In the near future, Slovenia must build a system of public transport terminals which will integrate the different systems of public transport at all levels: international, national, regional and local. The development of public transport must be one of the key elements in designing coherent regional development and achieving territorial cohesion; however, despite the recognized multifaceted social, economic, territorial and environmental advantages, the initiative has been left to the discretion of

the market and local communities, which financially and organizationally cannot handle the transition to sustainable traffic systems by themselves.

The illustration of the effect of building the Slovenian Motorway Cross and connections to the Mediterranean and Baltic–Adriatic corridors on sustainable spatial development and territorial cohesion of Slovenia can be summarized as follows: Slovenia is quite successful in its connections and in opening up to international space; however, this is not enough for the country's internal spatial development. Following the goal of integration in the international community, Slovenia must first take care of its balanced internal development and preserve its sustainable polycentric development by fulfilling the criteria of territorial quality, efficiency and identity. To show the significance of internal connections for Slovenia's balanced spatial development, we addressed the Third Development Axis where the results of the analyses (Fig. 4.3) clearly showed the benefits of it, particularly to local communities that will more readily connect to regional urban centres and consequently to European transport corridors. This objective, which is common to the local communities and the state, shall be realized by improving the implementation of existing legislation and more efficient operation of the institutions and other stakeholders involved, irrespective of the current economic crisis. To increase communication between the local communities and the state, the role of regional development agencies should be reinforced in a way to more effectively support regional development in their territories.

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Chapter 5
The Metropolitan System Along the Mediterranean Corridor in Northern Italy—The Problem of Magnitude and the Need of New Territorial Governance

Piero Pedrocco

5.1 Introduction

Speaking of the Po Plain metropolitan system along the Mediterranean Corridor, we must refer to a nontraditional settlement vision. This kind of vision finds its roots in a certain number of essays and publications concerning the development of various settlements along kinematical axes, based on communication and transportation infrastructures that sometimes evolve rapidly, while at other times takes a long time. For instance, BosWash is a name coined by Herman Kahn in a 1967 essay describing a theoretical US linear metropolitan system extending from the urban area of Boston to that of Washington D.C. This publication coined terms like BosWash,[1] referring to a predicted urbanization in the Northeastern US or SanSan for the urban agglomerations on the Pacific coast of California (Khan and Wiener 1967).

Of course, the idea of an urban linear system as a possible utopia to be improved came from earlier studies, like those of the linear cities by Arturo Soria y Mata in 1882, and then by Nikolaj Aleksandrovič Miljutin in 1933. Some might even appreciate, in this sense, the ideas of Le Corbusier in the 1930 masterplan for Algeri. An architectural translation of hypothesis designed as part of an urban development in previous years and effective part of the debate of the years of rationalism-functionalist. Soon, however, the application of these concepts overrode the simple urban dimension, even in the urban development's wake of the late twentieth century. The "coalescence" of many urban suburbs and the formation of large conurbations, especially those stretched along supporting cinematic axes among different regions, suggested the need for new urban and regional planning of settlements on a vast scale.

[1] BosNYWash is a variant term that specifically refers to New York City.

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The general concept for the described areas was first identified by French geographer Jean Gottmann (1957, 1961). But Gottmann's idea of megalopolis was an idea of order and a possible utopian term for planning regional area settlements that drew its inspiration from the centres of existing cities. It was assumed that a middle-class population had the right and interest to move quickly between them or by their periphery to the main centres then to move easily to other major centres. These phenomena, generating a strengthened economy, would take place in a framework of structural rationality. The coalescence between suburbs would not have had, therefore, great phenomena of complexity, if not those of a better hierarchical organization of transport systems for commuters. However, as we have seen since the end of the last century, this view was very optimistic. As a matter of fact, the urban "madrepores" were gradually enriched with new intermediate towns, large, small and scattered, and among them a whole series of reports rose, greatly complicating the urban and regional original system (Bagnasco and Le Galès 2000). Within these madrepores, and in function of counter-urbanization (Berry 1976) of various kinds, have grown numerous new centralities, especially in the nodes of the main transport axes and in correspondence of the transfer of cargo, due to interconnections between different modes of transport, of passengers and goods around the major centres, along the bypasses and major routes connecting the cities (Garreau 1991). In these places, a new economy has developed in parallel, coagent, with local, regional, national and even global levels of challenges, outside the traditional settlements and, sometimes, detached from the larger towns and ignoring them. As in the case of the Randstad (Holland), we have witnessed in recent past, some attempts to planning systems of cities cooperating in metropolitan forms (Perulli 2000). This, however, has not been particularly effective in stopping urban sprawl. Nor were identified the phenomena of mature and reproducible organization of urban patterns in similar situations.

5.2 The "Li.Me.S." in Northern Italy

On the basis of these premises, and on the basis of a study conducted by Matteo Maternini (1970), on the Po Valley Corridor and its transport network from Turin to Venice, some studies have been conducted in Northern Italy, in the PRIN 2007 entitled "From the metropolitan city to the metropolitan corridor: the case of the Po valley corridor", involving research units from the University of Brescia (leader), the Polytechnic of Milan, the Polytechnic of Turin, the University of Padua and the University of Udine.[2]

In these studies, it was pointed out the existence in the Po Valley of a Linear Metropolitan System (Li.Me.S., briefly LiMeS), with evident allusion to the Latin

[2] Programma di ricerca di interesse nazionale (PRIN) 2007, Dalla città metropolitana al corridoio metropolitano: il caso del corridoio padano, Ministero della Università e della Ricerca Scientifica e Tecnologica, 2007MMJS3_004.

Fig. 5.1 Density of population in 2008 (ISTAT data) on urban surfaces built up to the year 2006 (Corine Land Cover 2006). (Source: Busi and Pezzagno 2011, p. 47. It is not so important to understand how much soil is consumed, mostly agronomically estimated and not in an absolute sense, but rather as the soil is consumed and why. To manage the consumption of land means to reduce it. It highlights the continuity of settlements, the Via Emilia, but more importantly, also for the larger size of sprawl, the settlement alignment from Milan to Venice with the most dense areas in the node of Milan and in the Venetian plain.)

word *limes* (border), running from Turin to Venice, and down to Trieste for more than 500 km in the southern side of the Alps (Fig. 5.1). Some essays and books are still published on this theme (e.g. Busi and Pezzagno 2011; Cacciaguerra 2012; Boschetto and Bove 2012).

In these publications, the existence of this linear system of settlements, stretched out as a possible Southern European megalopolis, finds some raison-d'être in the historical development of the settlements and in their interdependencies coming by the infrastructures, where rural, urban and metropolitan behaviours depend on each other, and, at last, their overlapping produces the existence of a sort of "middle town" or "city in the middle" and the needs of local and regional governance for it.

There is no doubt that the settlements in Northern Italy have developed along the main Roman roads (Fig. 5.2). The first and most striking example is that of the Via *Aemilia* (Emilia), at the point of contact of the Po Valley with the Apennines, with cities almost exclusively aligned along the ancient consular road, which has been enlarged for only about 1 m in 2000 years. Even towards the Alps, however, there are similar situations in urban and road alignments.

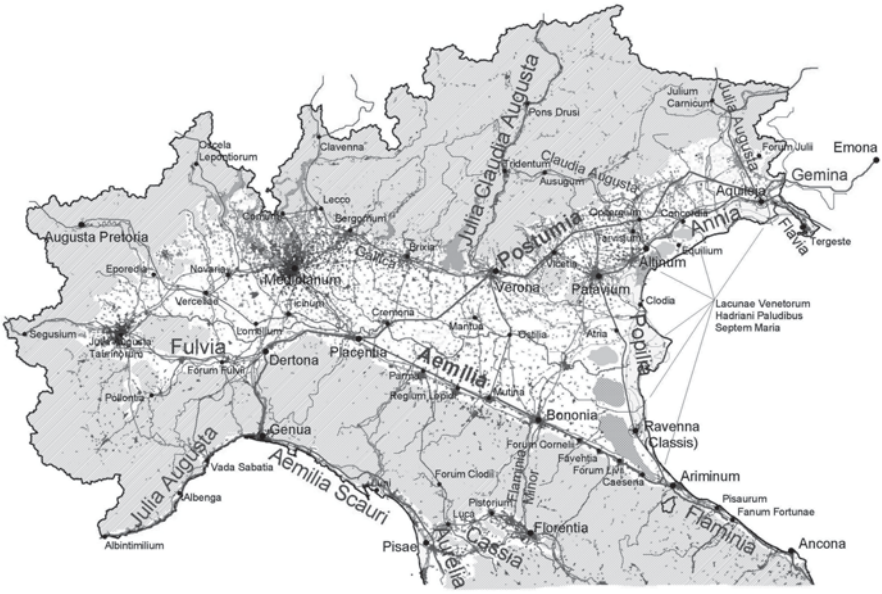

Fig. 5.2 The main Roman roads in Northern Italy superimposed on the density of the population in 2008 of Fig. 5.1. *Dark areas* are Alps *(North)* and Appennines *(South)*. (Source: Author's own elaboration)

Via *Postumia,* first, from Aquileia to Verona, Piacenza and Genoa, and then via *Gallica,* to Milan, are the main axes that gave support to the ancient settlements. It is to be noted that in ancient times the streets avoided the swamps, typical in the heart of the Po Valley, where the great rivers flow, and were modelled along tribal atavistic paths, along the dry land between the mountains and the plains. Later, during the Middle Ages, small waterfalls and mills consolidated settlements in contact points between mountains and plains, enabling the development of primitive forms of industrial craftsmanship in such places, connecting them to the consular roads. The waterways, leading first to the Roman emporium of Aquileia, then to the Byzantine Ravenna and finally, after the barbarian invasions, to the Byzantine emporium of Venice which inherited the functions of the cities that preceded it, completed the design, facilitating the consolidation of the Venetian towns along the main rivers and inside the same lagoon.

Between the ages of Commons and the Modern Ages, the municipalities of Northern Italy multiplied, fragmenting the territory, as opposed to those in Southern Italy, where feudalism resisted for a long time. This has resulted in a subsequent shedding of small settlements in the Po Valley and along the axes above described that were the beginning of the contemporary form of urban sprawl.

Small historical handicraft industry, many municipalities, cities 40–50 km apart from each other along the main roads and an innate tendency to trade are the basis for the development of the LiMeS along the Po Valley, from Turin to Venice and from there to Trieste.

Fig. 5.3.a The railway network in Italy in 1861. (Source: Friedrichstrasse 2010)

The railways of the mid-nineteenth century, in Northern Italy (Fig. 5.3a), still largely dominated by the Austro-Hungarian Empire, with the Papal States and the Bourbon Kingdom in Central and Southern Italy, were modelled according to the layout of historical cities, set at a distance equal to a day of long march of the Roman legions or corresponding to the change of horses of postal service of the Serenissima Republic of Venice.

The first major railroad, designed to connect the Viceroy of Lombardy–Venetia, was the Milan–Venice, connected to the Eastward South railway from Wien to

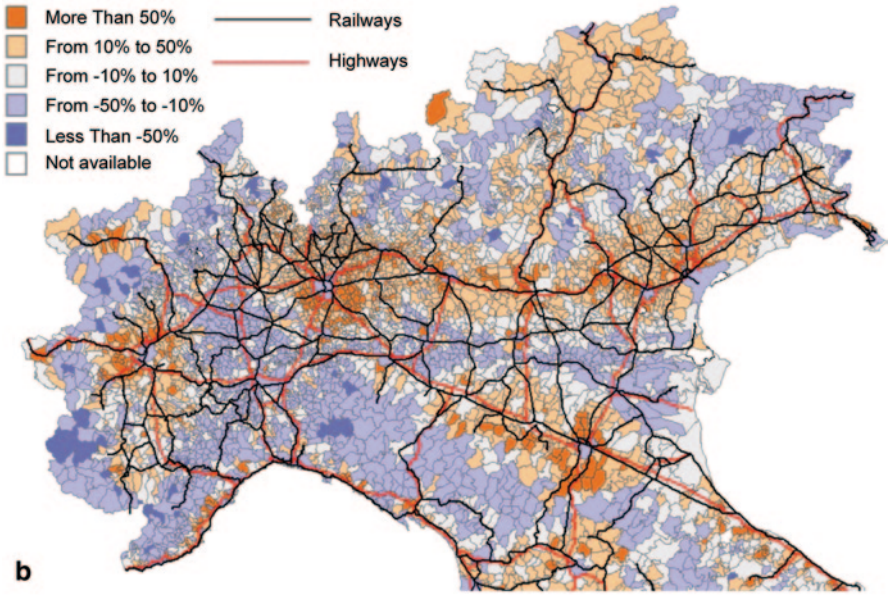

Fig. 5.3.b The tool motorway network in Italy in 1964. (Source: Stagni 2008)

Trieste and to the Westward Piedmont railways.[3] The same could be said for the construction of highways (Fig. 5.3b), implemented a century later along two main axes: the Turin–Milan–Venice (A4) and the Milan–Bologna–Florence–Rome–Naples (A1). In North Italy, these two axes support the two main linear systems of settlements described above. Thus, the two images in Fig. 5.3 outline the LiMeS that we are dealing with, being the basis for the industrial development of Northern Italy during the last century (Menduni 1999).

In demographic and geographic representations, Italy is a stable country, with low population growth rates, mainly due to immigration. However, Italy has too many small cities, untouchable and unusable for global competition. This claim needs clarification.

Italy has a population of 60,626,442 inhabitants, with an area of 302,072.84 sq km and a resulting density of 200.70 inhabitants per sq km. In comparison, Northern Italy has a population of 27,763,261 inhabitants, an area of 120,255.83 sq km and a density of 230.87 inhabitants per sq km, which is higher than the national average.

The estimated population of the metropolitan area considered can be summarized and divided as follows: (1) the "Monolith" of Turin, with the surrounding

[3] Only much later, with the unification of Italy, connections were realized between the network of the North, especially built by the Austrians and Piedmontese, and Florence, Rome and Naples, which, with the Naples–Portici, had seen the birth of the first rail of the peninsula, in 1839, with a total length of 7.25 km.

metropolitan area, which has about 2,354,000 inhabitants, with 6850 inhabitants per sq km, in a mono-centric metropolitan region that consists of a compact fabric; (2) the "Universe" of coalescent old cities, country towns and industrial settlements around Milan, which has about 5,230,000 inhabitants, with 6315 inhabitants per sq km, in a metropolitan region that tends to be polycentric and consists of a compact fabric; (3) the "Cenomane Dipole" (areas of Brescia and Verona), which has about 1,497,000 inhabitants, with 4900 inhabitants per sq km, with an environment that tends to be more traditionally urban; (4) the "Eastern Galaxy" around the central area of Veneto, which has about 3,125,000 inhabitants, with 5880 inhabitants per sq km, in a polycentric metropolitan region with a widespread urban fabric. So, the average density in this LiMeS is of 6076 inhabitants per sq km, distributed over 2,008.81 sq km, while the total population of the area is 12,206,000 inhabitants. However, population decreased in cities, especially in the historical and central parts (Fig. 5.4).

Since 1971, the counter-urbanization seems to have hit the country along with rarely occurring phenomena of "gentrification", when enriched people return to live in central areas. Wealthy people generally retain the central positions, and the middle or lower classes are those who leave and do not return. At the same time, Italian cities fail to regenerate because of the constraints due to their historicity. So they fail to have a sufficient number of offices in the downtown or in the core of the conurbation.

It so happens that some exhibition grounds, facilities, public utilities, exhibition centres and also fairs, and some managerial structures, are localized outside of urban areas, in areas served by infrastructure between different cities that, as mentioned above, are relatively small and very close together. These new centralities

Fig. 5.4 Change in population density from 1971 to 2001 (ISTAT data). (Source: Busi and Pezzagno 2011, p. 114. Note the decrease in population in all cities *(blue)*, with population growth in the municipalities of the urban belts *(dark orange)*. In *black,* railways; in *red,* toll highways.)

choose, whenever possible, the nodes of convergence or exchange between different infrastructures to locate or move from previous sites, which are considered less comfortable and accessible.

In even more obvious ways, this happens also for trade, where new shopping centres, hypermarkets, malls and large retailers tend to create market roads along the main routes of regional and national traffic (Garreau 1991). Here you can capture both the demand for trade in nearby cities and that of the surrounding urbanized areas. These new suburbs, which are linked with the nearby towns, form disordered urban filaments that assume greater importance along the major traffic roads. Otherwise, they generate conurbations of various kinds along perpendicular or diagonal axes, as particularly evident in the northern area of Milan or Central Venetian areas, the former very dense, the latter less dense and with extensions of low-density sprawl along the northern foothills up to the Friuli Venetia Giulia region, along plains bordering to the east.

Unfortunately, urban sprawl developed casually without an organized coherent planning. Therefore, having recent urban planning failed, the most interesting items to organize settlements on a large scale are major transport infrastructures (Fig. 5.5). These infrastructures are based on the corridors highlighted by the European Union through policies for the Trans-European Transport Network (TEN-T). As a second best, they are based on the local pattern of regional and local roads and

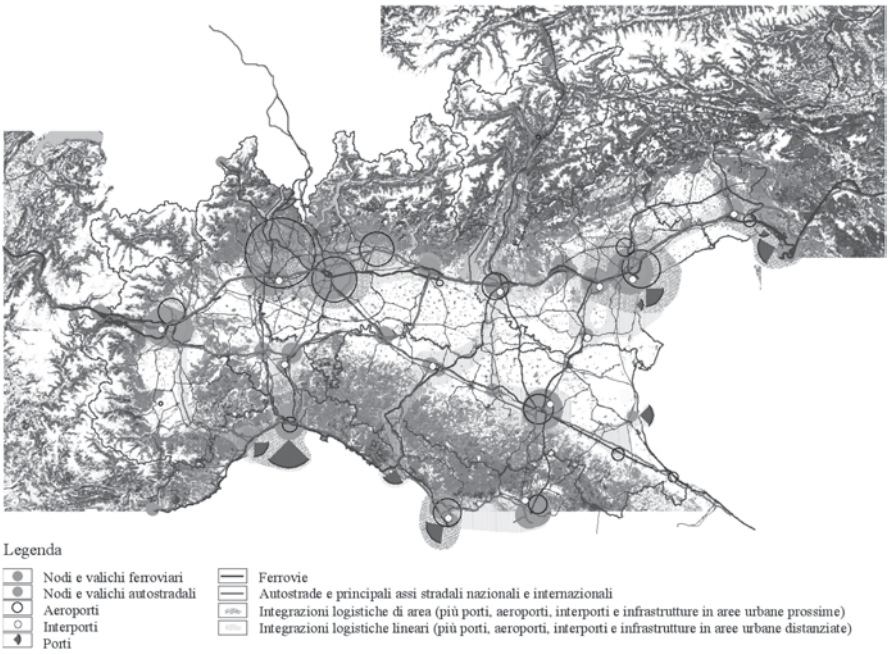

Fig. 5.5 Graphical summary of the major hubs of the system of the infrastructures in Northern Italy. (Source: Busi and Pezzagno 2011, p. 132)

railways. These railways in Italy depend on the State Railways system. However, soon these railways will also receive local railway lines managed by the regions or by private firms, in the form of regional metropolitan railways or *schnellbahnen*. This is very interesting. These regional metropolitan railways are meant to be used to transfer part of the traffic from private cars to trains. However, integrating some travel demand for commuters in metropolitan areas, they will inevitably generate new points of centrality and attraction for investors.

The same is happening with many interconnection nodes between different modes of transport, which would require forms of interworking, interoperability or better logistics assets for easier exchange of passengers and goods and for an easier transfer. The reasons for this attraction of investors are as old as the world.

When transport loads get divided, whether passengers or goods services are concerned, the demand for services increases. In turn, the presence of services attracts residence and services for the residence. These services and facilities, along with the amount of people or cargo that pass through the nodes, create the basis for an urban economy of agglomeration, which, based on the significance of the node, can attract investors at various levels, from the global to the local. Sometimes the importance of the node is also indicated by the architecture. When this happens, generally, there are no doubts about the significance of the formation of new urban centrality and thus of a new urban node.

These phenomena in Northern Italy are in fact occurring in major metropolitan areas and especially along former Pan-European Corridor V, which means even along the LiMeS, as seen above. Thus, new urban nodes of various levels develop around the consolidated cities (Fig. 5.5). This happens naturally, and it is widespread even at the local level (Fig. 5.6), in relation to minor infrastructures, thus generating various investment opportunities for real estate investors and a chaotic urban fabric, which is why it is so worrying (Sernini 1988).

5.3 Is There a Possible Governance in the "Li.Me.S."?

Which governance is required in this situation to the scale of urban and regional planning? The Charter of Venice, signed on 15 February 2007 by the assessors representing the seven regions of Northern Italy, was born out of needs of this type. It is time to "settle the interregional table for sustainable spatial development of the macro-region, also called the 'Adria-Po Valley', aimed at identifying a system of coherence and to promote the competitiveness of the regions involved in the new context of European development, in view of a multi regional scale".

This understanding has led to graphical representations that have been subsumed by both the *Relazione generale* (General report) of the *Piano territoriale regionale di coordinamento* (Regional Spatial Plan of Coordination) adopted by the region of Veneto, and is even shown in the table "F2–The supra-regional dimension" of the *Piano territoriale regionale* (Regional Spatial Plan) adopted by the region of Piedmont.

The "map on the polarity of the system", together with the "map of the infrastructural networks", drawing inspiration from ESPON European researches and ESDP agreement[4] and by the analysis carried out for the preparation of regional plans of the Italian regions, confirms the foregoing reasoning. The great corridor from Turin to Trieste, especially in its central part between Milan and Venice, is a large linear system of settlements, located between the mountain areas of the Alps, sparsely inhabited and naturalistically preserved, and the large agricultural plain of the Val Padana (Po Valley), where planning could provide linear metropolitan character and dignity, while major transport corridors from south to north represent fundamental axes connecting towards the European Union and the remnant Italy.

However, these corridors are not characterized in their structure by metropolitan system and settlements. The questions have been the same for years. From the point of view of transport, they are summarized as follows:

- How to reactivate the poles of the Adriatic ports in an intermodal logic and combined shipping as a service for Southern Europe and Central Europe?
- How to enable long-range transport on the continent for freight rail, removing traffic from congested highways?
- How to simplify physically and bureaucratically transits to the Alpine border crossings, within the European Union with border-free functions, still suffering from differentiated tolls and infrastructure bottlenecks?
- How to reconcile the need for new transport corridors and the need for improving existing axes, along with the resistance of population and traversed territories not directly benefited by the presence of those corridors?

At these transport issues, however, seem more and more added the problems of the settlements that are involved in catchment areas of transport of great size. This seems to evoke the logic of the megalopolis of Gottmann, which is a great megalopolis, but immature, perhaps unconscious, but also a megalopolis now different in (population and economy) behaviours from those outlined in the 1970s (Gottmann and Harper 1990; Gottmann 1987, 1983). No longer a sum of elements of well-organized hierarchical flow networks, with recognizable times and days for moving, but rather a linear "madrepore", composed of several towns, villages and cities, chaotic inside. Without a fixed schedule of movements, with mutable origins-destinations of traffic, complex commuters' flows and variable localizations. Flows that no longer take place between the major cities, or from the periphery to the centre. But between major and minor cities, between villages and other villages, without intermediation of any city, including stream relations among scattered places and country towns. To put it briefly: a system of random mobility and complex relationships.

[4] ESDP—European Spatial Development Perspective. Towards Balanced and Sustainable Development of the Territory of the European Union, agreed at the Informal Council of Ministers responsible for Spatial Planning in Potsdam, May 1999, Published by the European Commission, 3 Policy Aims and Options for the Territory of the EU, 3.1 Spatial Orientation of Policies.

Conceptual diagram of belonging, the "city" becomes a space of multiple elements distant from each other, joined by faster or slower transit, also specialized in places of tertiary, themselves moving. The "train office", fast as a French TGV, the interurban *tram-train,* and the various people movers in the neighbourhoods of some international city, in the airports or in the harbours, do not seem to talk to the traditional places of centrality, knowledge and culture. The site ambulates. It becomes more and more a place with wheels. But there are also many places where you can still arrive. Indeed, today there are many "*non-lieux*" that have become places, more than yesterday and all around. In these spaces, all the functions that cannot be carried out elsewhere will be obviously played, in a new urban location, if not on the go.

Thus, there is a need to plan new transport infrastructure regarding continental corridors with renewed wisdom. Avoiding the channels closed to the relations with the territory, but using new means, such as that they should not have to stop along the way, or on the contrary, able to stop at every station when it is required. Therefore, we need porous networks at the higher levels too, not only for the local transport systems. This is why we do not know how transport demand will evolve in the future. This is also why high-speed rail infrastructure should be adaptable to slow trains and freight trains. But that does not mean giving up high speeds. In fact, it is not an alternative to the high capacity of the railways. High speed mainly means being able to run fast trains. High capacity means to be able to run many trains. The two concepts are mutually reinforcing. Building high-speed lines that cannot run freight trains, because they are too heavy, would be fundamentally wrong. Wrong like trying to stop time, without looking ahead strategically.

We also need to think about the fact that with a random mobility and urban sprawl, the demand for transport becomes widespread. And this is cost effective only with high densities. This aspect explains the success of the linear metropolis. At the moment spontaneous and badly planned and organized, but probably interesting, in the future, in order to avoid further spreading of settlements, and in order to preserve parts of agricultural plain and untouched nature outside the LiMeS. That is why the high-speed railways cannot be derived only from the analysis of demand and supply of current transport and commuting. It must be mainly linked to a project of densification around the linear city. And a similar project, as a matter of fact, needs a high level of governance and visioning. The new metropolitan cities stressed by Italian constitutional acts and discussed over decades must provide an important element for this outcome. They may represent a starting point for the reorganization of the whole system of land government in Italy (Perulli 2000). The next step would in fact be to require municipalities, of all types and sizes, to collaborate in the realization of inter-master planning. This could be more significant along major axes of the infrastructure, where cities and towns follow closely one another.

Obviously, however, this is not enough. In fact, many problems must be structured and resolved at the scale of local planning, by deriving actually from a major scale. For instance, levels of relationships and behaviours, as mentioned, will become more and more complicated. Building a new motorway ring, or connecting a

new system of relations with fast trains with new stations or extending a section of a port, generates new centralities. And this complicates urban nodes of infrastructures, which are the first places to re-think (Fig. 5.6). Solutions to these problems should be dealt with at the local level often depending on decisions at a larger scale (Pedrocco 2012a; Pedrocco 2012b). But at the social and economic level, it is happening much more.

For whom new centres are rising or old centres are maintained or rehabilitated? Obviously, the variation of central locations may vary the users and new ones are attracted. So citizens with global interests break into the scene (Sassen 1994). They are different from metropolitan citizens or urbanites. In contemporary cities, in different spaces, but in spaces that are often mixed, citizens with very different interests can be found (Borja and Castells 1997). The global citizens have interests spread across several countries or continents. This will tend to require a monthly or annual programming of their time. The movements and actions to be taken are designed well in advance. They are not necessarily rich people. Indeed, very often they work in basic services, such as in a country richer than their birth country. Soon they develop a complex identity, international or intercontinental, with more than one domicile, with a tendency to privatization of services, multi belonging and multilingualism, and, as has been said, with a monthly or yearly mobility. So the means of transport and the network that most affect their lives are those pertaining to long-distance: today mainly the plane, rarely the ship. The influence on local economies is never irrelevant. Acting at various levels, especially in competition between central areas of great quality and places where new centrality is developing.

The way of living the megalopolis is relatively different. Here, identity has a more marked nature: national or regional. Who lives in more cities multiplies the access to services, in particular commercial ones. Even in this case, there are more domiciles, especially if the cities are distant. Concept that varies with the speed of transport. And so the identity can be plural. But the commute will be weekly. And the means of transport that dominates the lives of individuals becomes the high-speed train. For this kind of citizens, a typical statistical condition is to consider them as active citizens in an area, but workers in another one (Bove 2013; Pedrocco 2013b).

At the metropolitan level, we have other conditions. A single home, and then a single address. Without prejudice to second homes for weekend in the vicinity or elsewhere. A local identity, often dialectal, and a choice in services limited to the metropolitan area. The commute is daily and if the city is big enough it does not allow the return home for lunch. The dominant means of transport are the subway, the tramways and the buses.

The local level, that of a small town, the village or neighbourhood, that could happen even inside big cities or urban agglomerations, has a communal identity of citizens, poor access to services, one domicile in which people often return home several times a day, no commuting and a dialectal or provincial identity. Here, there are economies of niche for the cultural roots that is jealously guarded by the in-

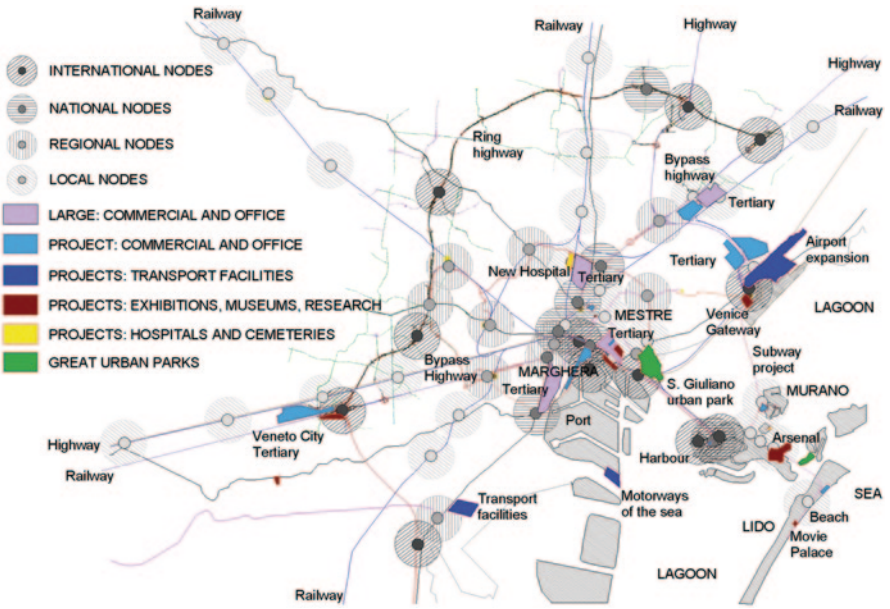

Fig. 5.6 The transportation hubs of international importance, national, regional and local level in the Venice urban area with the areas of direct influence by walking, and major urban transformation projects recently built and newly designed. (Source: Author's own elaboration. It seems obvious the attractiveness of transport infrastructure and of the major junctions and points of interconnection in respect of major projects of urban transformation.)

habitants, notwithstanding closeness to many opportunities for exchange with the outside.

It must be clear that the new urban and regional planning cannot forget all of these needs and requirements. It is equally clear that the organization of networks and nodes of transport plays a key role in redesigning the urban layout. However, it also seems clear that local authorities have few public resources (e.g. money) for the construction of road systems in support of the development of Italian medium-sized cities, which has already occurred since the World War II to the present. This does not alter the fact that if nothing is done soon to remedy a situation of lack of cross communication between the districts of the semi-periphery and periphery of our cities, the urban situation of Italian towns will be devoted to substantial deterioration. This is due principally to the following aspects:

- Childbearing age and working population have moved residence more and more towards the periphery, the country towns and villages of the urban belts, and this is not matched by an adaptation of public transport systems.
- Businesses, local production units and main services have been often relocated to the suburbs, where more space, easy access from the hinterland and lower land costs have replaced the advantages of centrality.

- Compared to the model of the industrial city in the twentieth century, the city today tends to be porous to the movement of users, without peak-hour traffic.

The consequence of these aspects lies in the fact that new centralities were formed in the peripheries, and more than dialoguing with the city centre and with traditional relational functions, they begin to communicate with each other, without involving the centre. It follows an enlarged polycentrism, entirely different from the past. Unfortunately, many medium-sized cities in the Po Valley and Veneto have never been able to equip themselves with effective lines for collective transport means, nor with concentric ring roads to sort motor traffic on multiple levels (Pedrocco 2013a). This may furthermore cancel the potential for major urban regeneration. For entrepreneurs, especially those of global and of megalopolis, the absence of facilities and infrastructure will greatly reduce their efforts in locating investment in brown field sites to be redeveloped.

5.4 Conclusions

Many politicians confuse the current crisis with an ordinary crisis in the medium term, often hiding themselves behind the lack of resources to beat around the bush. The low level reached by the late economic cycle of Kondratiev, more than 50 years after World War II, does not help the situation. Unfortunately, many engineers, architects and technicians increasingly think of the simplest and less expensive solutions to solve problems. However, often even the most trivial solutions that are hidden behind the shield of an easy environmentalism or the lack of funds. Perhaps, in the long run, even the most ineffective. Instead, this situation would require at least the following actions:

- Intervening on the main issues of transport networks to ensure the development of good architectures and the quality of settlements and to stimulate the qualification of the surrounding areas.
- Connecting neighbourhoods with new roads.
- Creating regional transport systems integrated with local systems and with high-speed rail.
- Improving the local transport systems, and among them especially the subways, which are often absent.
- Implementing urban planning at the district level (inter-municipal) for all cities and towns of the country (these policies had failed in Italy in the 1970s, with the ideas of the Comprensori, and are now living a new age of implementation, with the creation of ten metropolitan cities under the current legislation).
- Creating regeneration policies for cities, able to attract investors from abroad, rather than scare them with red tape, bureaucracy and excessive fees.
- Operating national transport policies, and when needed, transform new multimodal European corridors in LiMeS in order to ensure a better relationship between transport and population concentration, safeguarding agricultural areas, uncontaminated areas, wild spaces and farming.

- Enabling the linkages with Northern Europe through the planned TEN-T corridors without devastating the environment and talking openly with the people and local authority residing in the crossed territories, which must be involved in the decisional processes.

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Chapter 6
Spatial Planning and Multinational Implementation of European Mega Transport Infrastructure—The Case of the European Strategy for the Danube Region

Thomas Dillinger

6.1 Introduction

Dealing with the implementation challenges of Corridor 5 within the Poly5 project, it become evident that a multinational spatial strategy for the involved regions was missing. Planning for this mega transport infrastructure (MTI) was elaborated in sector-based planning approaches, where effects on the environment, economic and regional settlement structure have not (or lately) been considered. Thus, a series of difficulties appeared while building this important piece of the Trans-European Networks (TEN). Would the implementation have not been so conflicting if the interests of regions and local communities and the effects of this MTI were considered in a common spatial strategy? This question could not be answered, since the implementation of this MTI already started and no one can say if things would have been done better with such a spatial strategy. However, the idea came up on the possibility to get some answers from another strategy which is just about to be implemented—the European Union Strategy for the Danube Region (EUSDR). This chapter will investigate whether the EUSDR could contribute to the implementation of MTI in the Danube region.

6.2 The European Union Strategy for the Danube Region

To give an idea of the complexity, a brief description of the Danube region is provided. In many aspects, the Danube region is a very heterogeneous area with one common element: the Danube River. This river connects 14 states: nine EU member

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states (Austria, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Romania, Slovakia and Slovenia); two accession candidates (Montenegro and Serbia) and three other countries (Bosnia-Herzegovina, Republic of Moldavia and Ukraine). About 115 million people live in the Danube region and about 20 different languages with three different alphabets are spoken in this area from people belonging to five different confessions.

In the last century only, borders have changed several times. State systems have been established and then removed, more or less peacefully, with strong impacts on the maintenance and updating of road and rail infrastructures, which are needed as backbone for the development of the region. Nowadays, large parts of the Danube region have to tackle important economic, social and environmental challenges. So the question is: How to support development in such a fragmented region? Learning from the lessons taught by the Baltic Sea Region, the idea was to do something similar.

Against such a diverse background, the EUSDR was launched by the European Commission in 2010 and adopted by the European Council in 2011 with the aim of providing an additional frame for regions that face common challenges in the Danube macro-region. Basically the target of the strategy is to connect people, modernise transport interconnections and improve informatics access. Energy should be cheaper and more secure and the environment protected. Disparities in education and employment should be overcome. Trade and enterprise should increase and risks and disasters minimised (CEC 2010a). The strategy aims to contribute to the overall goals set out in the "Europe 2020" strategy, namely "smart, sustainable and inclusive growth". Via enhanced cooperation efforts, the EUSDR is also expected to increase the level of economic, social and territorial cohesion and support third countries in the Danube river basin on their current (or potential) EU accession path.

Drawing from the lessons of the Baltic Sea region macro-strategy, the EUSDR operates within the existing institutional framework and financial resources and seeks to promote cooperation across the regions and sectors of society. In particular, it aims at finding innovative partnerships to unleash additional or, thus far, untapped financial resources from the public and private sectors as well as at better aligning existing strategies and instruments.

The EUSDR is organised in 11 priority areas which are grouped into four broad pillars: (a) connecting the regions, (b) protecting the environment, (c) building prosperity and (d) strengthening the region, as shown in Table 6.1.

Priority area 1b (PA1b) under pillar (a) is dedicated to improve mobility and multimodality—road, rail and air links. Its overall aim is to improve the road infrastructure, complemented by air and rail transport to avoid congestion and ensure an efficient and environmentally sustainable transport system in the region. Priority area 1a under pillar (a) is dealing with waterway transport especially on the Danube River.

A defining feature of the EUSDR is its output-orientation and its focus on realistic transnational and interregional cooperation projects with visible mutual benefits for the people of the region. This is reflected in the Action Plan attached to the EC Communication, which lists projects to be implemented by stakeholders at all levels

Connecting the Region			Protecting the Environment			Building Prosperity			Strengthening the Region	
Mobility and multimodality	Sustainable energy	Culture and tourism, People to People	Water quality	Environmental risks	Biodiversity, landscapes, air and soil quality	Knowledge society	Competitive-ness	People and skills	Institutional capacity and cooperation	Security

Table 6.1 EUSDR's 4 pillars/11 priority areas. (http://wbc-inco.net/object/link/10305)

(CEC 2010b). This Action Plan is seen as an "integrated response" to overcome the challenges in the Danube region and is "the heart of the proposed strategy" (CEC 2010b). Thus, the EUSDR "underlines an integrated approach to sustainable development" (CEC 2010a). Moreover, a sector approach was chosen for its implementation and an "integrated place-based" approach is emphasised in the EUSDR. Good links between urban and rural areas, fair access to infrastructures and services, and comparable living conditions will promote territorial cohesion, now an explicit EU objective (CEC 2010a).

So, the EUSDR has on the one hand the aim to follow an integrated place-based approach and on the other hand the work within the EUSDR is organised in thematic sectors. In so doing, the work within the 11 priorities seemed to be done very independently and dialog between the different priorities appeared weak. For this reason, the so-called EUSDR Laboratory Group (Lab Group)[1] was established in the year 2011, similarly to the Lab Group of the EU Strategy for the Baltic Sea Region (EUSBS). But does the EUSDR Lab Group ensure an integrated approach? Basically, this informal discussion platform contributes "in terms of concrete implementation support and guidance for benefit of the implementing bodies for the strategy, in the first place the designated priority area coordinators (PACs), the programme implementers and the financing institutions" (http://admin.interact-u.net). The Lab Group will focus on key issues such as identifying and labelling existing projects and even generating, designing and funding of EUSDR projects to ensure an integrated implementation process of the EUSDR is not an explicitly mentioned task.

As shown, the EUSDR should contribute to an integrated approach; however, this aim seems hard to reach. Why? There are for sure many answers to this question, but planning practice showed that work organised in thematic sectors in general does not support integrated results. This does not mean that this approach cannot achieve such an aim, but that there is always a possibility that actors working in their thematic field concentrate on their main issue, forgetting the integrated dimension of specific challenges. The risk is that members of the working group, who are in general experts in their specific thematic subject, do not have the knowledge to work integrated and cross thematically. However, structuring the work in the EU-

[1] The core group consists of some 20 representatives of national and regional authorities responsible for objective 1, 2, 3 and IPA programmes, including coordination units, ENPI CBC, European Commission DG Regional Policy, interested PACs (exchanging information with all PACs), as well as the EIB and other financing institutions.

SDR in a more integrated manner might achieve better and more comprehensive results.

Besides the issue whether the EUSDR as such is able to implement an integrated approach, another question needs to be discussed, that is, does the work in the field of Priority Area 1b (PA1b), mobility and multimodality, contribute to an integrated and multinational approach?

According to the EUSDR Action Plan, mobility "goes beyond technical aspects and infrastructure. It includes organisational issues, meeting overall transport demand and seasonal/daily traffic peaks, spatial planning, lifestyles, innovations […]. An appropriate transport policy has to take into account all these, promoting multimodality, while also considering environmental respect, economic growth and social development" (CEC 2010b). Furthermore, Salet explicitly stated that: "it requires consideration of consequences not directly tied to the functional purpose of an infrastructure project. For instance, one should not just focus on infrastructure effects for a new railway but consider ancillary interactive effects on environment, economic development and settlement patterns" (Salet et al. 2012, p.42). Thus, analysing the reports of PA1b, we get a sobering observation: The coordination of multinational planning of technical infrastructures (e.g. roads and railways) in the Danube region is weak. Mobility issues in a broader, integrated approach cannot be discussed, because basic elements of multinational infrastructure planning have yet to be elaborated. For roads and railways, infrastructure is often not efficient or simply missing, especially regarding cross-border connections (to which national authorities do not give priority). It is explicitly mentioned that "problems are largely linked to a lack of coordinated planning, funding and implementation" (EUSDR, PA1b 2012).

The PA1b created maps (with the support of DG MOVE, TENtec team[2]) of the transport infrastructure system of the Danube region. This is a very important first step to have a clear picture of the existing transport infrastructure and the missing links, identified by all states in the region. More than 130 projects from 9 countries have been collected and evaluated. It is mentioned in the report that projects have a very wide diversity. It is stated that all of them contribute in a certain way to improve connectivity and mobility. But it is clear that it is difficult to evaluate them without having an idea of how the mobility in the Danube region should be organised in the future. Therefore, the "need for the common picture on the transport system in the region (common transport vision)" is a crucial next step for the future identified work. "This picture should give a basis to the group to identify critical projects for the region and to assure coordination with other priority areas" (EUSDR PA1a 2012).

In the 2013 report, the work on this common transport vision, named *Transdanuvios*, and the intermodal transport strategy development (DRIS) are mentioned as "basic tools for improving efficiency and effectiveness of the strategy […] projects

[2] TENtec is the information system of the European Commission to coordinate and support the TEN-T policy.

with significant impact on two or more countries […] projects of great transnational and institutional impact" (EUSDR PA1a 2013).

We can conclude that PA1b is working hard to achieve a multinational perspective on roads and railways infrastructure; however, a multisector perspective to overcome challenges in the Danube region in terms of mobility and multimodality is still weak.

6.3 EUSDR—A Solution for Better Implantation of MTI?

Returning to the initial question whether the Danube strategy is a multinational approach to connect spatial planning and implementation of European MTI. From a spatial planner's perspective, it can be summarised below.

The EUSDR—as a macro-regional strategy—is following a sector approach. It offers a good multinational platform to sector-related activities and projects. However, the multisector dimension is weak, even if one main aim of the EUSDR is to enhance integrative approaches. Furthermore, the spatial planning dimension within the EUSDR is practically nonexistent. But spatial planning could be the key element to harmonise the sector-related and regional interests. Following the argumentation of Dühr, "it would be useful to build-in spatial planning as a central consideration in future strategies [EU macro-regional strategies] from the beginning, as retrofitting such an important coordination task to ongoing actions and projects seems to be a major challenge" (CEC 2013). Thus, from a spatial planner's point of view there is need of a "spatial vision for the EUSDR", since a common strategy, a framework or reference, pillars and priority actions, which can direct and guide activities, are missing. Such a spatial vision should concentrate on issues of multilateral importance of the macro-region. Also the DG Regio "has emphasised that new initiatives should be explicitly supported by a clear and common strategy, bottom-up developed and in response to clearly identified shared challenges of the macro-region" (Dühr 2011, p. 10). Such a spatial vision could be the missing link to bring added value to EUSDR. Otherwise, the EUSDR might become another platform for sector-based multinational cooperation.

6.4 Spatial Visions to Improve the Implementation of MTI

As long as there is no common spatial vision, how is it possible to develop the territory of the Danube region? The implementation would be based more on national than on macro-regional interests, and the European Union (EU) perspective would be missing. Thus, whether it is useful to build an MTI, it can only be answered if you look at the issue in a cross-regional and cross-national perspective. Where are the most important economic areas, where are the international hubs, where are the

main agglomerations, which need to be connected or need improvement in their existing technical infrastructure network? Those are examples for basic questions with clear spatial impact. Also, Dühr mentioned that "a debate on the role of spatial planning in the context of the EUSDR would therefore be useful, on which basis the various calls for a better and more integrated and coordinated spatial vision may be considered" (CEC 2013). It is well understood that these questions are difficult to answer and many obstacles are on the way. Different national and regional interests have to be negotiated; thematic perspectives have to be compromised. But how could such a spatial vision be drafted? Some very first thoughts for the drafting process of such a spatial framework are provided as follows. In any regard, the process design for such an intention has to be carefully considered. In general, two approaches are possible: (i) drafting a common spatial vision out of sector concepts; and (ii) drafting a common spatial vision involving stakeholders of the thematic sectors from the very beginning, as better explained below:

(i) Given the sector-based structure of the EUSDR, there might be one possibility to form a common spatial concept out of the sector concepts. It might happen when sector concepts coming out of the work of the 11 priority areas, like the mentioned common transport vision *Transdanuvios*, are linked and combined to a general spatial vision of the Danube region. This is a possible approach but it holds high risks. In fact, there is no guarantee that the sector-based concepts at the end of the day are effortless to combine;
(ii) Another approach underlines the integrative task of a common spatial vision. Sector stakeholders contribute from their specific thematic and national views to the spatial vision. One starting point for this discussion and negotiation process could be the respective spatial development strategies of the member states. As a rule, these strategies are sector integrated and result from an integration process in the member states. In so doing, different national aims and interests from the member states will be confronted. It will certainly be a difficult and crucial task to agree on one common spatial vision. However, this "would ensure a stronger focus and clearer prioritisation of the actions and projects, and ensure that the transnational spatial dimension is the key driving force", as Dühr already noticed (CEC 2013).

Spatial planning experiences on the national, regional or even local level show how complicated such an approach can be. However, spatial planning teaches that, without such a procedure, an integrated development of a territory can hardly be managed. Another great advantage derives from the member states having elaborated spatial planning systems, embedded in a legal and institutional framework. In general, member states have national and regional spatial plans to support an integrated approach for development.

In such a way, macro-regional or European-level transport infrastructure can have direct regional and even local impact. For instance, a corridor (e.g. a motor highway) can be interpreted as a series of constructions on several buildings in different territories which are aligned next to each other. From the perspective of the macro-region or the European level, it is a corridor. From the perspective of a

municipality, it is a building on their territory, which has to be embedded in the Spatial Development Programme of the municipality, finally in a land-use plan. This aspect needs to be considered from the beginning, when drafting corridors for MTI. Not doing that, it should not be a surprise if we face problems in the construction phase of MTI. Therefore, states should develop instruments and mechanisms in the discipline of spatial planning systems to be able to avoid these kinds of implementation problems.

In general, state planning systems give municipalities a very predominant position regarding spatial planning, even in more centrally organised planning systems. As mentioned before, there are instruments and mechanism to ensure the building of transport infrastructure of regional and national interest. However, when it comes to the point of implementation, the voice of the municipality is finally very important. Thus, it is important to link the spatial vision to the legal and institutional spatial planning framework of the member states in the macro-region. According to their legal and institutional spatial planning framework, the states have planning instruments at different levels (national, regional, local). These instruments are interrelated and getting more and more precise regarding their spatial predication. Within this logic, a spatial vision for a macro-region is an additional spatial instrument as framework for the spatial planning at the state level. In a systematic hierarchy of planning instruments, this system could look as follows:

- Spatial vision macro-region (Macro-region level)
- Spatial Development Programme (State level)
- Spatial Regional Development Programme (Regional level)
- Spatial Municipal Development Programme (Municipality level)

As described earlier, the elaboration process of such a spatial macro-regional vision might be a delicate matter, and another consideration might be helpful for efficient implementation. Since the Danube region covers a large territory, which makes the drafting process of a spatial vision quite complicated, it might be helpful to follow a step-by-step approach and elaborate spatial visions for parts of the territory, for example, spatial vision for the upper, the middle and the lower Danube region. Subsequently connecting these spatial visions should be an easier task to handle.

6.5 Conclusion

The EUSDR has so far no spatial dimension, and a sector-based approach in regard to MTI is predominant. The multinational setting should be of greater advance to get a better view on mobility demands in the Danube region. The common transport vision *Transdanuvios* and the DRIS is a first step to improve transport infrastructure.

A macro-regional approach such as the EUSDR can help in better implementation of MTI if a sector-integrated and spatial approach can be managed. A common spatial framework, such as the proposed spatial vision for the Danube region, also

defining MTI of macro-regional importance, would contribute to the implementation of MTI. This spatial vision has to be linked with the legal and institutional spatial planning framework of the member states. If the EUSDR will not be able to do so, the strategy would stay on the level of any other sector-based planning approach, facing well-known problems when implemented in the territory of the member states within the macro-region.

Analysing the so-far achieved results of the EUSDR, it cannot be said that an efficient multinational strategy has been reached or that it could be useful as an example for the Poly5 region to implement Corridor 5. Notwithstanding the presence of a strategy and a well-structured schema of multinational working groups, it seems to be very difficult to bring together different views and interests from the participating stakeholders. To get regions and municipalities involved in such a strategy is very challenging. But this involvement at an early stage is even more important for the implementation and acceptance of MTI, as we learned from the Poly5 project. Also, the integration of sector-based considerations and the elaboration of a strategy with a spatial dimension—another lesson learned in the Poly5 project—is extremely important, but practically not existing in the EUSDR, as investigated in this chapter.

Thus, it is a strong belief of the author that macro-regional strategies can contribute to a better implementation of MTI, such as Corridor 5 for the Poly5 region, but the achievements reached so far in the EUSDR give no reasonable answer to this question.

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Chapter 7
Territorial Cooperation and Multilevel Governance in the Brenner Base Tunnel Project

Bruno Zanon

7.1 Local Territories Facing Large-Scale Infrastructure Projects

The rapid change occurring in the economy, spatial organization, as well as institutional systems, affects states and regions, which must face crucial re-territorialization processes. In particular, European integration has produced a shrinkage of the European space and had important consequences in various fields, most of them with a spatial dimension. The result is that regions and countries (as well as economies) which were previously separated by political and customs barriers are now in close contact. As such, they gain advantages and encounter problems. In particular, the "gateways" to states and regions are being shifted from national borders to infrastructure nodes, in most cases coincident with the major metropolitan areas, while the enlarged scale of mobility and privatization processes are producing a concentration of companies operating on a global scale and the proliferation of small enterprises operating in niche markets.

New routes for goods and passengers have been opened, which require new connections, the innovation of current networks and the integration of transport systems. These challenges concern both the construction of new infrastructures and removal of the technical and organizational obstacles connected to the traditional national-based systems of regulation and management of infrastructure and transport. An example is provided by the railways: European national companies, generally state owned, made (and still make) use of incompatible technologies and regulations, thus reinforcing the threshold effect of national borders. The privatization

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process and the withdrawal of states from the direct management of railways—as well as other transport systems—are part of this change. They create room for the use of new technologies and management techniques, and consequently decouple transport basins from national spaces.

Since the re-organization of infrastructure networks is the basis for the integration of economies, markets and territories, it becomes a central issue at the European and national levels. It concerns technical problems as well as institutional issues, spatial organization decisions, financial investments and regional development strategies. Not only must engineers be involved but also spatial planners, politicians and local administrators. In fact, infrastructures play a crucial role in the construction of the territory in physical and socioeconomic terms. Thus, a change in the configuration of infrastructures modifies spatial relationships by generating territorialization and re-territorialization processes.

A preliminary issue is that large-scale infrastructure lines could mainly connect localities with upper-level places, or else they would simply traverse territories without providing any local service. Thus, conflicts and opportunities depend on how projects are proposed, developed and managed, and on how territories are able to meet such challenges. In fact, infrastructures must be organized respecting high-level logics, and nodes are located to serve larger territories. As a consequence, smaller localities tend not to have direct access to the service, and need to define a scalar way to be connected to the different infrastructure levels.

A second issue concerns how transport systems are managed. There is a great deal of rhetoric, especially in Italy, on the support for local development expected to derive from the construction of an infrastructure line or facility (Salone 2011). But it is matched by limited attention to how systems are managed. The privatization process entails a different role for the public, which must define goals, devise strategies, select/regulate operators and monitor the quality of the service. In Italy, apart from high-speed trains, whose operation is (nearly) open to the market, public transport requires the public sector (the state and the regions) to pay a substantial share of the costs.

A further issue concerns the need to integrate the various territorial scales and management levels. In particular, a multilevel interaction must be established so as to connect all the levels and sectors involved. This applies to both the infrastructure systems (motorways, railways, airports, etc.) increasingly managed by private companies and to the political and institutional tiers of the state, regions and major cities (which in many cases are the owners of, or the major shareholders in, the mentioned companies).

Lastly, integration of the infrastructure networks with the territories involved (which means combining economic, material and social capital) is crucial if projects are to be properly defined and full benefits are to be gained from the investments.

A recent contribution on complexity and uncertainty in decision-making concerning mega transport infrastructure projects (MTIPs), recalled by Sandro Fabbro in the opening of this book, stresses three major issues: the institutional change, the learning process and the balance between generation and reduction in policy

options (Salet et al. 2013). This means addressing the multiple facets of large-scale infrastructure projects, and to appropriately consider risks (Flyvberg et al. 2003; Flyvberg 2007), that are usually underestimated due to a "strategic misrepresentation", which leads to the "systematic underestimation of costs and overestimation of benefits" (Flyvberg 2007, p. 585).

Problems therefore regard not only transport policies and projects but also a range of issues at different spatial scales and involving different political and administrative levels, from the European Union (EU) to the member states, involving regions and local communities. As a consequence, multilevel territorial governance processes must be activated, to which spatial planning and local projects should be coherently connected.

This chapter addresses these issues on the basis of previous and current research work (Zanon 2010, 2011, 2012, 2013) by focusing on the "Brenner corridor" (i.e. the Scandinavian–Mediterranean Corridor) and in particular on the case of the Brenner Base Tunnel (BBT), the new railway infrastructure which is expected to play an essential role in improving connections at the European scale to cross the Alps, but requires huge investments and an appropriate interaction among the line, the territories traversed and the nodes to be created or reinforced, and around which re-territorialization processes must be planned. Thus, the emerging questions can be expressed as follows:

- How can a European-level project be integrated at the local level and, conversely, how are local territories taking up the challenge?
- What are the expected effects and what "territorial projects" are being elaborated?
- What supra-local and international cooperation methods are being developed?

7.2 Territory, Infrastructure Networks and Territorial Governance Re-scaling

"Territory" is a term denoting, on the one hand, the government of a space and, on the other, the relationships among activities, local communities and places. The latter meaning is progressively extending from some countries and languages (France and Italy, in particular) to many European documents (from the ESDP: CEC 1999, to the recent Territorial Agenda 2011) and disciplinary approaches. In fact, territory cannot be simply conceived as a surface defined by a boundary and under the control of a set of political and administrative institutions, or as the physical basis on which to allocate activities and structures. It must be conceived as resulting from the complex relationships among the local society, the natural heritage and the historical organization of space (Bagliani et al. 2010; Balducci 2011, p. 34, note).

From this perspective, the infrastructure is a crucial component of the territory, for it involves the spatial dimension, the physical organization of the (urbanized)

space, the relationships among communities, economies and places. The complex nature of the infrastructure has suggested its definition as a "socio-technical" construction (Graham 2001) because it builds the territory by enabling communication, transport and relationships to take place: "It is through the networks that territories form a system" (Offner and Pumain, quoted in Offner 2000, p. 170). A change in the infrastructure therefore involves different aspects of a spatial/territorial, social, economic, political and administrative nature.

Infrastructure projects are usually proposed as key instruments to support regional and local development, on the assumption that the improvement of accessibility and the reduction in transport costs are pivotal in supporting socioeconomic development, because such actions operate as "space shrinkers" (Flyvberg et al. 2003, p. 3). But connections regarding places, communities and economies, and the actions undertaken to organize the space by means of physical networks, become important only when they are strictly connected to the involved socioeconomic environments, so that the embedded material capital can be appropriately linked with social networks (Rutten et al. 2010).

Connections can be physical and immaterial, and networks operate on the basis of "proximity" and/or "connectivity" (Graham and Marvin 2001). This means that spatial dimensions and physical and organizational features characterize networks in different ways, and that their effects on the socioeconomic environment are not univocal, depending on the ability of local societies to take advantage of the opportunities offered by improved networks. In short, they must "be connected" and not just "close to" the infrastructure and the sites where the socioeconomic processes take place. It is this strict relationship between material and immaterial, physical and socioeconomic aspects that requires attention when infrastructure networks are developed or re-organized, because a deterministic mechanism of socioeconomic development depending on the provision of an infrastructure cannot be presumed. The usual discourses can be summarized in slogans like "be on the map" (Jensen and Richardson 2003) or "more networks for better accessibility for more GDP" (Espon 2004, p. 466). Yet, new infrastructures can bring about effects only when they become part of the physically embedded capital, thus improving the "territorial capital" (Espon 2007; Camagni 2009), which is both the material and the immaterial (social and cognitive) endowment of place-based capital.

A fundamental aspect concerns the decisional process. Many stakeholders are involved, at different scales and operating in diverse sectors; the investments required by infrastructure projects are huge, and the impacts on the environment and the spatial organization are important as well. The benefits depend, therefore, on the ability to integrate the new networks with the local economies.

As said, infrastructures are crucial in the construction of territories, and territories—at their different scales—coincide with a number of political and administrative institutions with specific responsibilities. But a rapid and profound change is taking place in institutional responsibilities. Scholars have defined this process "territorial governance re-scaling" (Brenner 1999, 2004; Amin 2002; Gualini 2006), meaning that the traditional institutional organization based on a nested articulation

Table 7.1 Government versus governance systems. (Source: Author's own elaboration)

	Traditional government	Multi-scalar/multi-sectoral governance
Spatial levels	Nested territories and politico-administrative levels	Multiple spatialities
Spatial scale competencies	Each territory: one public provider/one population to be served	Multiple actors/diverse service basins
Infrastructure and operators	Coincidence between infrastructure provision and service management	Distinction between infrastructure provision and service management
Public versus market	Services and infrastructure management as a public sector task	Management through competition

of responsibilities has been superseded by a complex system of overlapping competences. The re-scaling process and the "hollowing-out" of state powers (Jessop 1997) are related to the new role of the EU and to the emergence of regional, political and administrative levels (MacLeod 1999), as well as to a new role of market players. In particular, the usual mechanism by which a local authority provides services to the citizens of a specific territory has been replaced by a multiplicity of jurisdictions each providing a specialized service, and whose territorial extension depends on economies of scale and—increasingly—on the market. In short, to be cited are the definitions provided by Hooghe and Marks (2003, p. 236), who identify two types of multilevel governance. The first type describes "jurisdictions at a limited number of levels…" as "every citizen is located in a Russian Doll set of nested jurisdictions". The foundation for this type of governance is federalism. The second type consists of specialized jurisdictions referring to specific tasks such as water provision, public transport management, etc. This perspective is that of a functional, overlapping and competing jurisdiction (FOCJ) governance system (Frey and Eichenberger 1996), by which "[e]ach citizen… is served not by 'the' government, but by a variety of different public services industries" (Ostrom and Ostrom 1999, p. 88). The current condition is therefore defined by a plurality of scales, actors and arenas coexisting in the "multilevel game" (Gualini 2003) illustrated by Table 7.1.

This innovated framework challenges not only the usual government mechanisms but also consolidated spatial planning instruments, which tend to be no longer effective. The Italian planning system (defined "urbanism tradition": CEC 1997; Espon 2007) has generally emphasized the quality and coherence of the physical design, as well as the regulative role of plans. In fact, planning is considered as somehow consisting in the "drawing up of maps", which constitutes the basis for the legally binding force of plans, via land-use rights assignment. This character encourages the inclusion of all the desired projects, in particular roads and railways, which simply imply drawing a line on a map, as is the case of most infrastructure projects (Priemus 2007, p. 639). The result is the definition of a long-term perspec-

tive whose realization is highly improbable because it is disconnected from the financial programmes and the involvement of the different institutional and non-institutional stakeholders. Planning should instead be the method and the instrument with which to analyse, produce knowledge, select priorities and assess costs and effects. It should also be the means to construct coalitions among stakeholders that traverse territorial borders, institutional roles and sectoral competencies. Drawing up maps is only one of the tasks to be accomplished.

7.3 Innovating the Infrastructure Planning Approach

The effects of infrastructure networks are not evenly distributed because transport and communication lines are organized into networks composed of nodes and lines corresponding to places and flows. As said, places lying outside the networks and spaces between the nodes may suffer from disconnection, not from distance (Bobbio and Dansero 2008), as a result of the so-called tunnel effect (Andreu 1998, quoted in Graham 2000, p. 116), which means that territories traversed by high-level infrastructure lines cannot take advantage of their physical presence because the service is provided at specific points where, on the contrary, a "pump effect" (Fabbro and Mesolella 2010, p. 31) is activated. Infrastructure networks are therefore "territorial selectors" (Offner 2000, p. 167) which produce important de-territorialization and re-territorialization effects.

What is required is a new planning approach able to connect infrastructure planning, spatial planning and economic development programmes together. In Italy, an important scheme has been developed by the Ministry of Infrastructure with the support of Italian Society of Urban Planners (SIU) within the framework of European funds programming (MIT 2007). To construct a vision as well as operational perspectives, a number of "strategic territorial platforms" have been proposed, their purpose being to integrate infrastructure networks with socioeconomic and settlement systems within "territorial projects" pursuing polycentric urban development (MIT 2005; Janin Rivolin 2010; Fabbro and Mesolella 2010; Zanon 2011). The aim has been to activate structural connections between the "territories of identity" and the "territories of competitiveness" within a system where better equipped "nodal territories" should provide strong links with the European scale. The conceptual model (Fig. 7.1) describes the relationships between territories and infrastructure networks: Each territorial level should be served through a scalar system allowing mobility from the local level to the larger one by means of different infrastructure networks. And the infrastructure endowment at each level must be coherent with the specific "territorial project" developed. In other words, the infrastructure, as physical–spatial capital embedded in a territory, must be appropriately combined with economic and social capital, thus allowing pursuit of a shared development strategy.

Notwithstanding the interest of the conceptual model, the concrete proposal exhibits some weaknesses, in particular, because it received support from regional administrations without the revision of regional plans and programmes (Zanon 2011).

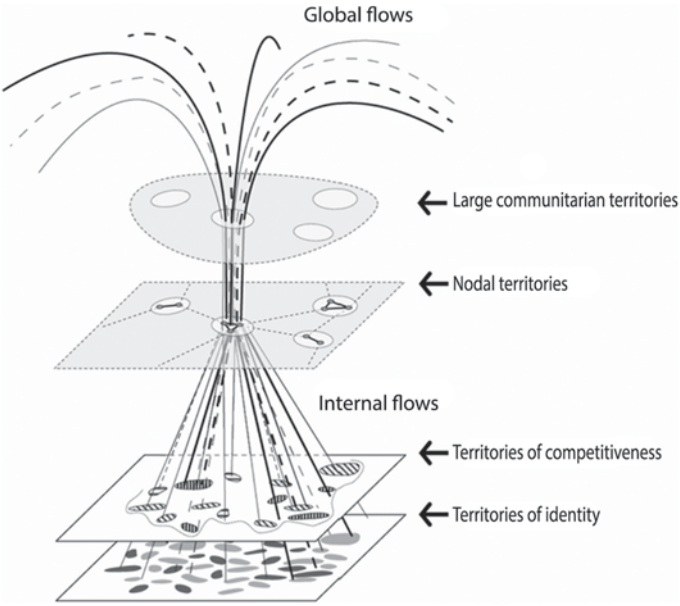


Fig. 7.1 The conceptual model of the Italian "strategic infrastructure platforms". (Source: MIT 2007, modified)

The result is a plethora of infrastructure projects—motorways, high-speed railways, airports, harbours, etc.—which not only should equip all the regional territories more or less in the same way but also create inconsistencies in the system and conflicts on the use of resources and between competing projects.

A particularly complex situation is that of European-level projects, because they concern upper-scale networks which must be integrated at the local scale, not only avoiding the heaviest impacts but also providing advantages, albeit indirectly. The Treaty on the Functioning of the European Union (TFEU art. 4) defines Trans European Networks (TENs), among which some major transport lines are included (TEN-T), as a competence shared between the Union and the member states. States are therefore asked to cooperate with the Commission and are expected to "coordinate among themselves the policies pursued at national level which may have a significant impact on the achievement of the objectives" (TFEU Title XVI). TENs are therefore EU-level objectives which require multilevel cooperation.

In Italy, TEN-Ts are seen from different points of view—as opportunities and as threats—and in both cases, rhetoric enhances expectations and exacerbates fears. The proposal of the territorial platforms has not been able to overcome the current fuzzy situation and to re-orientate decisional practices (Fabbro and Mesolella 2011) in order to avoid a "geography of territories" being opposed to a "geography of networks" (Bobbio and Dansero 2008), which would mean a break between local societies and upper-scale territorial organization. In some cases, such a fracture could produce severe social conflicts, as in the Susa Valley, an area close to Turin where the construction of the high-speed rail line towards France, requiring a long

tunnel under the Frejus Pass, has been strongly opposed (Bobbio and Dansero 2008; Marletto 2011).

7.4 The BBT Within the European Core Network

The case of the BBT is particularly complex because it requires tackling contradictory needs, concerting conflicting interests at different scales and coordinating many stakeholders. The project concerns a new itinerary across the Alps, which constitute a delicate and fragile territory protected by a number of provisions, and in particular by the Alpine Convention, whose transport protocol is intended to prevent the construction of additional motorway crossings. Trans-Alpine railway lines have been in operation since the mid-nineteenth century, but the increase in passenger and in particular freight traffic is necessitating the improvement of the transport system. Various infrastructures are involved, but the effort is concentrated on a new railway line since the existing Brenner line cannot be upgraded by means of localized interventions. Thus, the doubling of the line from Verona to Munich is required. This implies constructing a long tunnel under the Brenner Pass (which will be one of the longest tunnels in the world), together with a number of other works to overcome bottlenecks due to the gradient of the existing line between Bolzano and Innsbruck, the low speed allowed by narrow bends, and critical interactions with the urbanized areas traversed.

The BBT is part of a major European transport axis which had been included in the EU TEN-T programme from the outset as Priority Project 1 (PP1). With the recent TEN-T revision, it is now the Scandinavian–Mediterranean Corridor (connecting Helsinki to Valletta as priority no. 5). The BBT project has been termed "the heart" of the Berlin–Verona–Bologna–Naples–Palermo railway axis traversing Germany, Austria and Italy (Fig. 7.2), whose improvement is expected to support a modal shift from road to rail. The section is located between Innsbruck, in Austria, and Fortezza/Franzenfeste, north of Bolzano/Bozen in Italy. It will be pivotal for an efficient system at the continental level because it will overcome the bottleneck of the Alps, where the existing railway, as said, has insufficient technical features and the motorway cannot bear the entire passenger and freight traffic, particularly due to environmental problems and conflicts with the inhabited areas. The inclusion of the project in the European "core network" confirms that substantial financial support (30–40 % of the costs) has been granted by the EU for its construction.

The project consists of a 55-km-long cross-border tunnel, connecting to the north with the recently improved Innsbruck–Munich railway, and to the south with the historic Brenner line, which needs substantial improvement to create a line with a low longitudinal gradient and large-radius bends. The goal is to enable the traffic of high-speed passenger trains as well as heavy-freight trains to overcome the current restrictions (short trains, additional engines, etc.). The interoperability of different traction systems is also a goal of the project.

The strength of a TEN-T project depends on its scale and continental role; however, traffic affects the various segments of the axis differently, and the difficulties

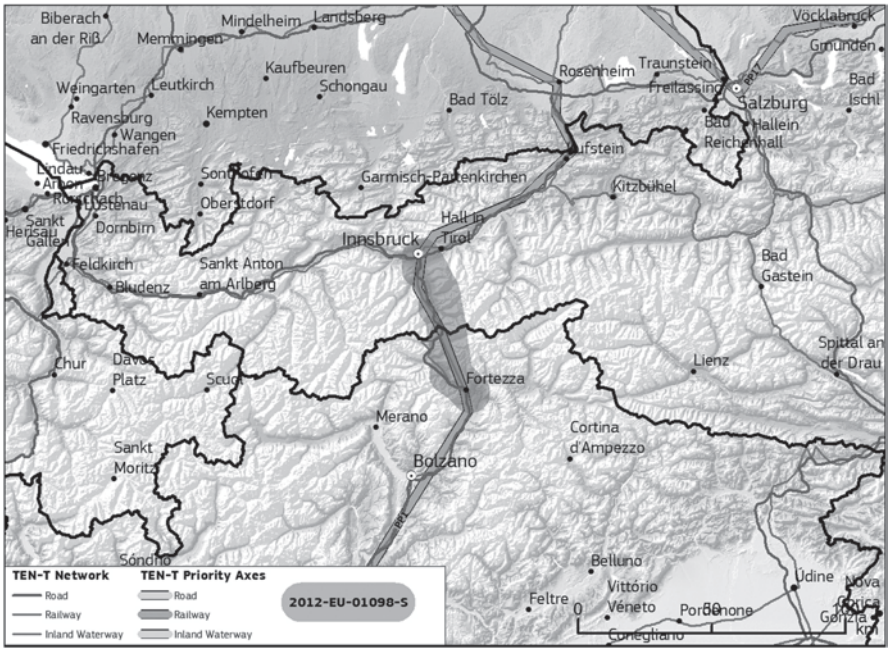


Fig. 7.2 The Brenner Base Tunnel within the Berlin–Palermo railway axis. (Source: EU INEA 2012)

encountered in its realization are diverse. The territories traversed therefore have contrasting attitudes towards the project. A renovated network must bring advantages to the localities involved, first by avoiding negative impacts, and then by allowing "territorial projects" centred on the new nodes to be developed. Without such local projects, the corridor will not be viewed as an opportunity.

In the near future, the railway currently in operation will reach congestion sooner than the motorway, which will be able to cope with the increase in traffic, apart from some peak periods due to tourist mobility, for a long while to come. In 2011, the Brenner Pass was crossed by an average of 22,000 light vehicles and 9000 trucks per day (A22 Motorway data). Few kilometres north, some 12 million vehicles a year cross the Europa Bridge in Austria (Ansa data). Thus, the problem mainly concerns freight traffic. The Brenner is the most important gateway to Italy for the rest of Europe, as it accounts for nearly 30% of total trans-border traffic, which presently runs mostly on the road (67%) (Table 7.2).

Freight traffic along the Brenner corridor does not solely concern the Alpine regions, for only a small fraction of the traffic is generated by those territories. Most of the traffic is generated much further away. Moreover, a large proportion of transits at the Brenner Pass consist of traffic "deviated" due to the higher costs of Swiss or other Alpine itineraries. In the near future, the Gotthard Tunnel will be opened and new opportunities will be provided, changing a part of this scenario.

The BBT, therefore, cannot be considered simply an engineering project, because it involves decisions on how to manage trans-border mobility, how to interact

Table 7.2 Freight traffic at Brenner Pass and other Alpine passes. (Data source: Alpinfo 2011)

	Road			Railroad			
	VMP 1000	Total mio.t	Road + railroad	Total mio.t	TCC mio.t	TCNA mio.t	SM mio.t
Brennero	1885	28.2	42.2	14.1	2.8	6.4	4.9
		66.8%	100.0%	33.4%			
Alps Ventimiglia-Tarvisio	7032	99.0	149.1	501	17.8	24.7	7.6
% Brennero	26.8	28.5	28.3	2.8	15.7	25.9	64.5

mio.t net million tons, *VMP* heavy freight vehicles (trucks weighing more than 3.5 t), *TCC* whole carriage traffic (without combined traffic), *TCNA* combined traffic not unaccompanied (huckepack unaccompanied traffic and containers), *SM* combined accompanied traffic (RoMo, Rollende Autobahn)

with the territories traversed, where to put the nodes and concentrate the services. It concerns, in particular, the re-organization of freight transport, with the allocation of inter-modal centres and the definition of coherent rules among the territories, in particular those concerning mobility governance, which is operated by means of restrictions and tolls to cross the Alps along the various trans-border lines. There is, therefore, a strong need for coordinated policies and for "territorial projects" centred around the new line and in particular its new nodes, which have to play a pivotal role in economic and territorial development.

Traffic management along an international corridor also requires interoperability of the transport systems and coordination among operators, especially in view of a more competitive market and a plurality of companies involved. It requires removing the conflicts between the different transport options, namely between the motorway and the railway. The terms of the conflicts are in part well known, and in part specific to the case. First, traffic along the existing motorway is highly energy consuming. It produces noise and pollution, which affect the territories involved, but it also generates tax revenues, and for the case analysed, the benefits are local because the motorway company is owned by the local authorities of the regions traversed. On the other hand, the construction of a new railway, which is very costly, is expected to support a transfer of a huge amount of traffic from the road to the railway. However, this cannot be imposed in a market environment, and in Austria, the "eco-point" system, limiting the number of passages, has been discontinued and only a night ban remains on heavy traffic. Little can be done on the restriction side, and the rest must be done on the side of benefit production in order to re-orientate the market. The large-scale transfer of traffic therefore requires an effective re-organization of the freight transport system, while the privatization process has induced the Italian railway company (state owned) to withdraw from international traffic, both for passengers and freight, and only a few other companies provide a trans-border service.

7.5 The State of the Project

The project has a long history. The idea of a new railway crossing the Alps, with technical features more advanced than those of the historic line, was long considered, and new designs were proposed back in the 1970s. In 1989, a feasibility study was approved by the Ministries of Transport of Germany, Austria and Italy. Meetings and negotiation processes among the states followed, and in 1994, the European Commission also joined the agreement and included the project in the TEN-T network. The individual states began to develop other complex procedures in order to provide agreements at the different levels (among the states, the various national ministries, with the regions-Länder, among the railway companies, etc.) and to cover the expected costs.

Problems arose in regard to various aspects. Apart from the technical solutions to be agreed on, financial problems were (and still are) pivotal, not only because of the magnitude of investments but also because of the uneven distribution of the expected benefits among countries and regions. In particular, Austria mostly results as a traversed territory with only a small participation in the north–south traffic flows, while it would have to cover a significant share of the construction costs. Other operational issues concern the management of the project. In this regard, a company taking the form of a European Economic Interest Grouping (EEIG) was set up in 2004, and was later incorporated as Brenner Base Tunnel company (BBT EEIG), in accordance with European laws. Other aspects were the activation of a number of initiatives in order to support the project and to build consensus among institutional and non-institutional stakeholders. In short, the technical features of the final project are the following (Figs. 7.3 and 7.4):

- Two interconnected tunnels plus an "exploratory tunnel" 55 km long (24 km in Italy and 31 km in Austria), implying a total of 180 km of tunnelling
- Maximum train speed: 250 km/h
- Longitudinal grade: 4.00–6.70‰

As said, the southern connection with the Italian railway network requires doubling the line from the new tunnel to Verona in order to provide coherent technical features (in particular a low gradient in the Fortezza–Bolzano section) and to by-pass the urban areas along the narrow Adige Valley. Solutions for the entire line have not been developed yet, but there is a general consensus on underground itineraries, which would imply huge investments. This preference is determined by local opposition against possible nuisances produced by a surface line.

The works of the tunnel started in 2011, after Austria and Italy had agreed on the total cost of 7460 million €, thus activating the so-called Phase III consisting of the start of excavations. The exploratory tunnel is now being excavated, together with other service tunnels, from different sites in Austria and Italy. Work in all other sectors should start in 2016. The continuity of works depends on the financial flow, which must be guaranteed by the states, which are now re-programming investments after the financial crisis (European Union 2012). The completion date of the

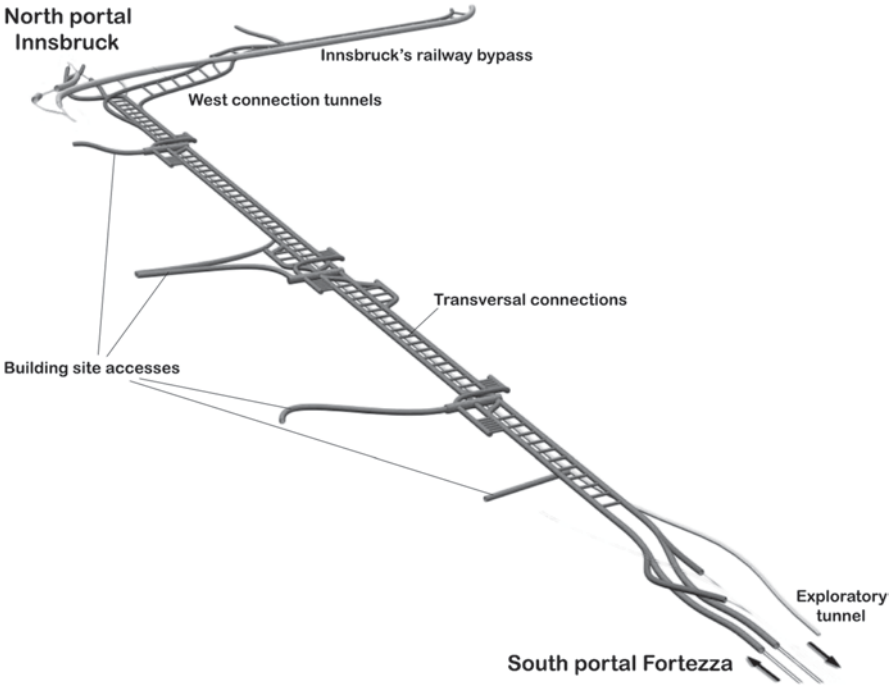


Fig. 7.3 Project of the tunnel. (Source: BBT SE 2013, modified)

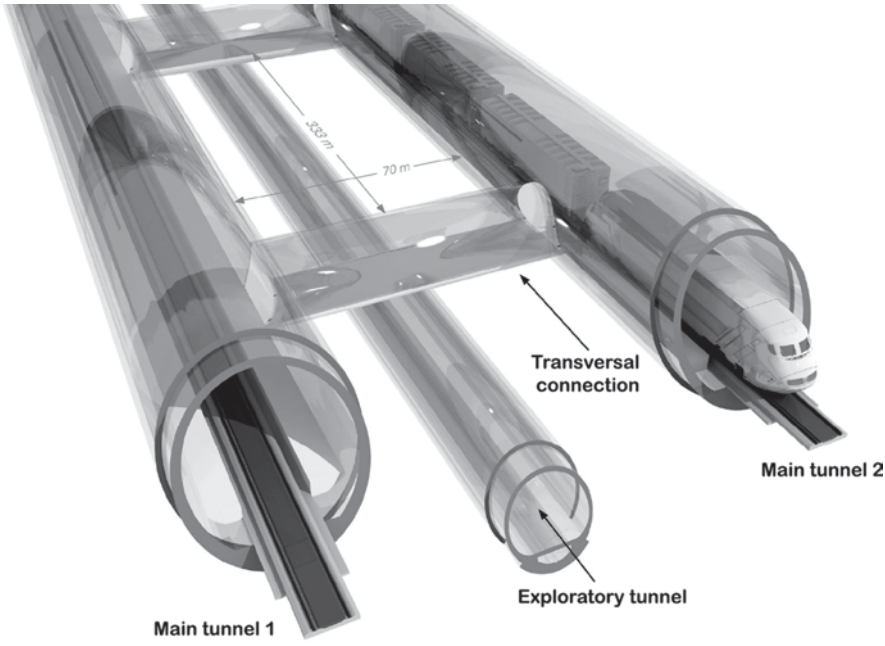


Fig. 7.4 Model of the tunnel. (Source: BBT SE 2011, modified)

BBT has been repeatedly postponed and currently is set for 2025, while agreement has still to be reached on the southern access routes.

The project's expected effects are, on the one hand, a shift of freight traffic from road to rail and, on the other hand, a support for economic development. The most promising scenario (with a horizon to the year 2027) forecasts a share of railway freight traffic ranging from 36 to 57 %, with a total of 50 million t. This corresponds to nearly 5000 trucks per day still driving along the Brenner motorway and the shift to the railway of the equivalent of nearly 6500 trucks (DIMS 2011, pp. 165–168). These figures cannot be simply the effect of the completion of the infrastructure, but rather of a more complex re-organization of traffic flows along the Brenner axis. This re-organization involves regulations and limitations for Alpine crossings by trucks, the concentration of goods handling in particular nodes, the interoperability of trains, and an effective role of rail companies in managing freight transport.

Regarding the effects in terms of economic and territorial development, they depend on the ability of regions and cities to take advantage of the provision of better connections, to reshape the spatial organization and renovate the production and delivery of goods in order to form "territorial local systems" (Governa and Salone 2004) oriented to the new gateways. Also, passenger traffic should be re-oriented, if the high-speed features of the line are to be seriously considered. In particular, an impact on the operations of regional airports along the itinerary is to be expected, considering, for instance, that Verona airport currently acts as a feeder for the Munich hub, and such a role can be threatened by a high-speed train connection.

7.6 Stakeholders and Cooperation Methods

Given the magnitude and the complexity of the project, a large number of institutional and non-institutional stakeholders are involved. This has required the use of new cooperation methods and the activation of ad-hoc structures in order to support coordination and consensus building. In this regard, it should be stressed that the EU Commission has introduced the use, also for TEN-T projects, of the open method of coordination so that member states can play an active role within an EU-level programme.

Among the stakeholders involved, first to be mentioned are the institutional ones: states, regions/Länder and autonomous provinces (Bolzano-Bozen and Trento). All these play a key role with precise competencies, as far as infrastructure construction and management, spatial planning and financial support are concerned.

Other institutions and organizations intervene: for instance, the Euro region Tirol-Südtirol-Trentino, some cooperation organizations (Alpine Space; Arge Alp) and pressure groups. In general, these stakeholders are supportive of the project, in some cases including it in their programmes and policies, but some pressure groups and parties have expressed their positions against the tunnel, which are much softer (Debernardi 2004) in comparison to other cases, such as the Susa Valley (Bobbio and Dansero 2008).

As a result of institutional decisions and actions, and in order to support negotiation and to give status to stakeholders with operational roles, other structures and companies have been created. In 2006, the *Brenner Base Tunnel company—BBT* was founded. This is a public limited company which has replaced the *BBT EEIG* and is in charge of the construction of the tunnel. It is a transnational company compliant with European laws, whose shares are owned by Austria and Italy via other national companies. In Italy, the financial company is *Tunnel Ferroviario del Brennero—Finanziaria di Partecipazione—TFB*, 83 % of whose shares are owned by the state and the rest by the provinces of Bolzano, Trento and Verona.

A cooperation structure is the *Intergovernmental Commission Italy/Austria* founded in 2004 after a *Bilateral Commission*, and which coordinates the two major partners.

Another structure supporting cooperation among the institutional stakeholders is the *Brenner Corridor Platform (BCP)*. This was founded in 2007 on the initiative of Karel van Miert, former EU Commissioner for Transport and at the time coordinator of the European Corridor 1. It is a forum involving three states: Austria, Germany and Italy; five regions: Land Bavaria, Land Tyrol and provinces of Bolzano-Bozen, Trento and Verona; and three railway companies: RFI, ÖBB and DB. Its purpose is to improve mobility along the corridor, in particular by supporting the modal transfer from road to rail, and it takes part in decisions on the project.

A larger structure is the *Aktionsgemeinschaft Brennerbahn—Comunità d'azione Ferrovia del Brennero (AGB-CAB)* involving the regions and the chambers of commerce and aimed at controlling the impacts on local territories, also by means of an observatory.

Another cooperation initiative, *iMonitraf!*, started as an EU-funded project within the Interreg scheme. It has become the tool with which the Alpine regions agree on common policies and monitor traffic through the Alps. It provides basic data on mobility (Lückge et al. 2012) and thus accompanies other initiatives, such as *Transit*, the observatory of traffic between France and Italy, *Alpifret*, the Swiss-based observatory aimed at controlling freight traffic (Alpifret 2011), and the periodical publication *Alpinfo*, of the Swiss federation (Alpinfo 2011). Within the *iMonitraf!* framework, Alpine regions have agreed on a common transport policy document, and on an action plan centred on the transfer from road to rail of freight traffic and defining limits on truck transit. For the Brenner Pass, in 2030, the maximum flow should respect the amount defined by protocol 9 of the Austria adhesion treaty to the EU: 1,000,000 trucks per year (iMonitraf! 2012).

On the railway companies side, the *Rail Net Europe Corridor 4* comprises the various companies directly involved in the project.

Lastly, the European Commission has nominated a project coordinator, who is currently Pat Cox, after the late Karel van Miert. He is in charge of supervising the project's development and his reports are delivered every year. Also, Italy has nominated a commissioner, namely Mauro Fabris.

The need to find appropriate solutions to a complex issue has given rise to the aforementioned list of cooperation structures, which are aimed at specific goals and, accordingly, involve different partners. The project, in fact, implies not only a focus

on the infrastructure but also the coordination of different policies, and in many cases the redefinition of regulations and the re-orientation of decisions and actions. Completion of the project also depends on the ability to collect enough money to ensure a constant flow of resources. This means redefining taxation, re-directing the use of public money and involving private partners.

There are some paradoxes to resolve, however. In particular, road traffic currently generates revenues for the public via taxes on fuel, road tolls, etc. Whether this flow off sets the environmental and health impacts is a matter of debate, but on the financial side, the reduction in road traffic will reduce such benefits. In Italy, as said, local authorities are the shareholders of the Brenner motor-road company, and every year they receive large amounts of money from it.

For some years, Austria and Italy have applied a policy which off-loads some of the costs of the Brenner tunnel onto road traffic. In particular, the traffic along the Austrian motorway contributes to the tunnel's financing, and in Italy, the Brenner Motorway Company accumulates money to be transferred to BBT Company. But matters are more complicated because the concession of the Brenner motorway is subject to public competition, and the company (backed by the local authorities-shareholders) is using the money earmarked for Brenner tunnel to apply pressure on the state (and EU) in order to prolong the contract. In the case of a new concessionaire, the cross-financing mechanism of the tunnel's construction will be applied anyhow, but local benefits will disappear, being connected to the locally owned motorway company. In any case, the money generated by the road traffic is not enough to cover the investments, and other resources must be found.

7.7 Local Strategies and Projects

The difficulty of agreeing on a large-scale project depends, as said above, on the plurality of stakeholders involved at different spatial scales, on the presence of conflicting interests, and on the unclear production—and uneven distribution—of benefits. The technical complexity of the project is therefore only one of the issues at stake, while different attitudes emerge among the territories involved, which see the line and the nodes as either nuisances or opportunities. The usual rhetoric on infrastructures which depicts them as icons of progress and economic development or, on the contrary, as environmental evils and financial disasters, makes things more complicated, in particular because an array of other projects are put forward as alternatives.

The Italian spatial planning tradition described above, centred on the production of maps representing decisions and future projects, apparently provides decisional soundness but, in fact, generates additional complexity by multiplying proposals. In particular, regions and provinces are engaged in the drawing up of territorial plans, and at this spatial level, a variety of infrastructure projects are usually included in the name of economic development and of network completeness, regardless of the level of agreement on the proposals and their financial feasibility. Hence, not only

do territorial plans become lists of desired projects, but in many cases, neighbouring regions propose incoherent or competing projects.

Along the Brenner–Verona–Bologna axis, together with the new railway line, a number of motorways are proposed (and in part their construction has begun), and regional airports and multimodal centres are multiplying. However, such investments have scant coherence with both the European network and a national transport system.

At the local scale, cities perceive large-scale infrastructure projects in opposing ways. Analysis of ongoing initiatives shows the different development strategies concerning mobility flows illustrated in Table 7.2. The alternatives can be summarized as "concentration of flows", "flow diversion" and "flow control".

The first strategy is evident in the case of Verona, where two major European corridors cross a busy logistic centre in operation (*Quadrante Europa*), while others are planned, and the local economy is taking advantage of such opportunities to develop import–export activities. It is thus possible to identify "territorial projects" centred on the goal of becoming a European mobility node.

The second strategy is that of the city and province of Bolzano. The new railway line will cross the territory without producing impacts. The difficulty of constructing a passenger station or a freight centre along such a high-level infrastructure has oriented decisions towards a "contactless" line, which means mostly underground.

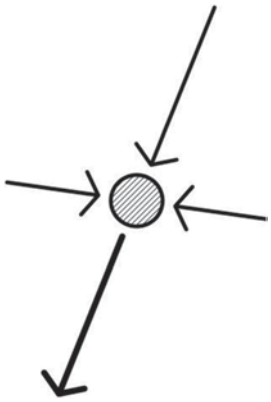
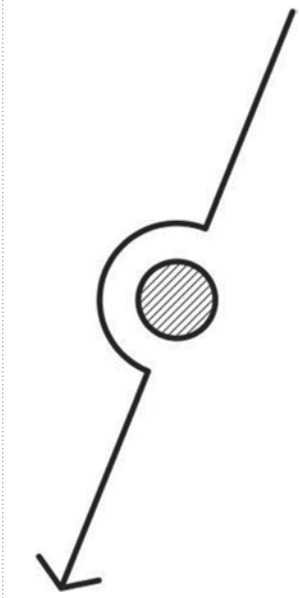
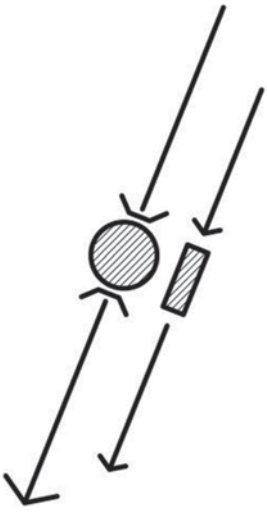
The third strategy is that of the city and province of Trento. Some benefits from the line are sought, in particular by creating an interchange between the historic railway line and the newly planned one in order to connect the multimodal centre operating north of Trento, and to allow a new passenger station—still debated—to be built. However, most efforts are spent to participate in the control of flows, particularly through the control of companies managing the infrastructure. In fact, substantial benefits are expected, not just from the physical presence of a line or of a node, but from the control of financial flows and the fiscal revenues generated by the companies in charge of infrastructure management and/or traffic control (Table 7.3).

7.8 Conclusions

The conclusions that can be drawn from the foregoing discussion concern the difficult progress of the project due to the intrinsic complexity of such an undertaking and tangle of the interests at play due to the number of stakeholders involved at different spatial scales.

A top-down decisional procedure cannot be imposed but the path followed has been uncertain and risky. A multiplicity of cooperation and coordination structures have been activated with the involvement of different stakeholders, but the core decisions are taken by two states: Austria and Italy. The EU is providing framework and orientation to the decision-making process through the co-financing leverage,

Table 7.3 Alternative local strategies. (Source: Author's own elaboration)

		
Strategies		
Node strengthening	Flow deviation	Flow control
Local actors		
Logistics, industry	Local authorities, pressure groups	Logistics, utility companies
Advantages		
Becoming a mobility hub	No nuisances	Fiscal and financial benefits
Risks		
Congestion, environmental impacts	Disconnection from European networks	Disconnection from European networks, temporary benefits

but the strategies and the actions of states and local stakeholders are not clearly defined. In Italy, regions, provinces and cities intervene in this EU strategic project in a manner not much different from other infrastructure proposals, and in some cases, they give stronger support to competing projects. The state, for its part, constantly asserts the strategic role of the Brenner tunnel, but its financial support to it is an open issue.

A mix of institutional and non-institutional structures has been activated. Although the real power is wielded by the states, other stakeholders, in particular the local authorities, have a substantial veto power on unwanted options. Cooperation among regions is playing a role, but the Euro region, which in the case of the Brenner tunnel has long been activated, is not the player which can be expected, or has been proposed, as a new governance level in the European framework (Fabbro 2010).

The issues raised by Salet et al. (2013) concerning the complexity and uncertainty in mega infrastructure projects are relevant also to the Brenner tunnel case, and their consideration allows to highlight some weaknesses of the decisional process. First of all, the debate on the institutional change has been centred on the re-allocation of powers from the state to regional/provincial institutions, not on the construction of a coherent multilevel governance system able to tackle trans-scalar issues. Second, the elaboration of the project has only partially contributed to the development of a learning environment, in particular because the project has not been concerted among the institutional stakeholders operating at the different territorial levels, and because solutions have been generally found by "displacing the problem", in particular diverting the route under the mountains, thus hiding criticalities, increasing costs and reducing the feasibility of the project. Third, the generation of solutions was controlled by local institutions, which operated in a piecemeal way considering the sections of the infrastructure of their territorial competence, in order to neutralize the presence of the line or to integrate it within the given territorial (i.e. socio-economic) structure. Strategic and operational decisional levels have not been managed in a multilevel way, and the "unpacking" of the project has taken place, "slicing up" the infrastructure according to the consolidated institutional—and spatial—power system.

Anyhow, in the Brenner tunnel case, the usual steps of a spatial planning process are being followed—analysis, knowledge production, strategy elaboration, negotiation among stakeholders and assessment of results—but in a disconnected manner, often with a duplication (or multiplication) of efforts and structures. A coherent spatial planning process aimed at territorial cohesion, sustainable development and competitiveness has not yet started and seems difficult to activate, although it could be a means to construct effective governance mechanisms coordinating the various sectoral and spatial level stakeholders.

In general, weak local territorial projects are being devised, as testified by the spatial and urban plans. The province of Bolzano-Bozen has included the Brenner tunnel in the local statutory plans, but no local projects can be connected to an underground line. The city of Bolzano has developed an important urban project for re-development of the railway station, but in many respects, it is independent from the new Brenner line. The province of Trento has included the project in its spatial plan (Provincia autonoma di Trento 2008), but no important consequences on the territorial organization emerge, apart from the possibility of connecting the line to the multimodal centre and constructing long tunnels. The Veneto region has included the project in its proposed regional plan, as well as in other programming documents. However, it has done so together with a number of other infrastructure projects, whose completion will require huge amounts of money and which are only partially coherent with the new Brenner railway. In particular, the proposed completion of the Valdastico motorway is in partial competition with the Brenner tunnel project, because it runs the risk of increasing road traffic instead of transferring it onto the railway.

Therefore, local strategies engender many risks. First, the Brenner tunnel and the access routes are not yet considered the mobility "backbone" of the regions

involved, which requires the reshaping of accessibility to places. As a consequence, there is a dispersal of resources, which should instead be concentrated on this large-scale project and the connected nodes. Then the fragmentation of institutional stakeholders still persists, notwithstanding the cooperation structures activated. Lastly, local policies should be subjected to more effective control in terms of coherence with the European programmes and with the national infrastructure scheme, because local territories are betting on different—and not coincident—projects. The assignment of European and national funds should strictly follow the agreed plans and priorities, preventing the emergence of "conflicting geographies" composed of European projects, national strategic platforms and regional high-level infrastructure lines and nodes.

A comparison can be briefly made with the other Alpine tunnel cases: Gotthard and Frejus. In the former case, only one state is involved, but the federal status and the traditional involvement of citizens in decisions regarding public investments have pushed towards the clarification of goals, on which citizens have agreed through referenda: the large-scale project has been accepted, but on the condition that a modal shift from road to rail is coherently pursued. Consequently, a financial programme and converging policies and actions have been put into practice, in particular truck traffic control and a taxation system allowing coverage of the forecast costs (Marletto 2011).

The Frejus case is more similar to the Brenner one, with the difference of a strong opposition by local authorities, citizens and pressure groups against the Italian high-speed train (TAV). In fact, the management of decisions among the states (France and Italy), the regions and local stakeholders has not been effective. On the Italian side, the illusion that a shortcut can be found by giving the state a stronger role has produced a project requiring major improvements, and it has provoked strong local opposition. Further attempts to follow a negotiation path have not completely restored trust in the leading stakeholders.

In the Brenner tunnel case, the story is different only as far as the end is concerned, because no strong opposition has emerged, but a lesson must be learnt on the need to activate effective multilevel governance procedures. The traditional set of institutional and political and administrative tiers, the consolidated spatial planning tools and the usual mechanisms concerning the management of sectoral competences are no longer effective in the case of complex large-scale projects. And the multiplication of coordination and cooperation structures suggests that there was no clear understanding of the project's complexity at the beginning, because as soon as new problems emerged, new structures were promoted, whose role and effectiveness are difficult to appreciate. Certainly, the management of Austria–Italy intergovernmental relationships played—and still play—a central role, while the European Corridor commissioner, who is "a man on the project", has been able to obtain the partners' trust, thus helping them to find viable solutions.

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Chapter 8
Action Planning and Equality in Mega Transport Infrastructure Projects

Petra Hirschler and Nina Svanda

8.1 Introduction

The planning of major transport infrastructure projects (MTIPs) is becoming more and more complex. Apart from technical requirements, social and environmental impacts became increasingly important in the last decade of the twentieth century. So nowadays, transportation planning is much more than the application of traffic models and solving technical problems taking into account technical, normative and legal requirements. Transportation planning is no longer an objective, scientific problem-solving activity, but it has become a complex process of highly stochastic procedures, bearing risks and uncertainties. Mobility is embedded in the existing gender relations of our society. As an essential part of citizens' daily life, the MTIP must also be adapted according to the needs and wishes of both women and men. Nowadays, it is essential to integrate the gender perspective in the entire planning process and include goals for gender equality that are related to the objectives of the whole project.

This chapter reviews approaches to planning tools and gender mainstreaming in the context of MTIPs and identifies recommendations for the planning process. Case studies in Austria showed how planning tools and gender mainstreaming can work in practice for mega infrastructure projects.

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8.2 Planning Approaches for MTIPs

To ensure an efficient and effective processing of strategic and multidisciplinary tasks, the usual formal planning procedures and methods as well as routine solutions are often inappropriate. In most cases for strategic long-term planning decisions, new and further methods and approaches are needed, even though during the course of the planning process, approved methods and routine solutions are usually applied (Schönwandt et al. 2011).

Planning approaches are normally composed of four components: problems, objectives, methods and specific background knowledge. These four components are dependent on each other and always come together.

There exist a lot of different planning approaches, and planners can choose which one to apply to their specific problem. Every planning approach highlights planning tasks and their environment through specific lenses. So, the choice of the planning approach has a significant influence on the result of the planning process. Therefore, specific planning approaches should be applied according to the specific planning situation.

The interdependences between the four components of a planning approach make it necessary to think about the order of dealing with these components. An appropriate way would be to start with agreeing on a problem definition by all relevant actors. Then desirable objectives, the relevant knowledge background and appropriate methods should be specified. Planning approaches are changing over time, as well as our knowledge and our values. They are not right or wrong, but suitable or unsuitable, relevant or irrelevant relating to specific planning issues (Schönwandt and Voigt 2005).

8.3 Complex Major Task of Planning

The planning of mega transport infrastructures, in particular across national boundaries, is no routine or project task but a complex major task for planning. Complex major tasks are comprehensive spatially relevant tasks, and it is not clear what projects can solve them. They also need to be worked on in a comprehensive professional and organizational cooperation often between different levels of government and cannot be treated sector by sector.

When attempting to solve complex major tasks, questions concerning an appropriate organization and adequate instruments occur. Specific tasks need specialized organizations. Often the routine of the public administration is not entirely suitable to address complex interdisciplinary issues. Routines are repetitive tasks which can be done by already thought-out and established working processes and organizations, rather than thinking about each time how a problem can be solved when it occurs again. Well-functioning administrations solve routine problems with routine work through operative management which ensures that the work is carried out with

a high level of efficiency and legal certainty. To solve complex, multilayered and interdisciplinary planning tasks with an intense level of communication, a temporal project-orientated planning organization is needed to allow complements and extension of the procedures of the public administration. Furthermore, the provision of existing professional intellectual competence from outside the public administration for the planning process has to be allowed (Scholl 1995; Tschirk 2012).

The "ad hoc organization" for spatial planning supplements existing organizations for a limited period. The structure and procedures of the ad hoc organization are aligned with the needs of the complex major task for planning. The ad hoc organization is, to some extent, the "core of action planning" as defined by Bernd Scholl (1995).

8.4 Action Planning and the "Wiener Modell"

Bernd Scholl's action planning (1995) is based on the experiences in the planning of the Viennese Danube Island, which had been developed into a favourite recreational destination for the local population after a flood protection project. This was made possible by a unique planning organization, called the "Wiener Modell". The "Wiener Modell" is a cooperative planning instrument with thorough involvement of planning teams, external experts and municipal experts, which has evolved from competition procedure for the integration of the flood protection project "Neue Donau" into the urban context of Vienna. The planning instrument was tested and further developed in the scope of different projects like the planning of main arterial roads in Vienna, the strategy framework for the Olympic Games in Frankfurt-am-Main or the improvement of the public transport in Frankfurt-am-Main (Scholl 1995; Freisitzer 1985).

The maxims of action planning are listed as follows:

- "Ad hoc organizations" are organized in such a way that politicians, experts representing the administration, external experts from different nations, experts from different institutions as well as relevant stakeholders can be integrated in the planning process. The composition of "ad hoc organizations" is based on the following findings: "Ad hoc organizations" for planning tasks are structured in a small constant core group which is enlarged with changing participants. The number of hierarchical levels is small. "Ad hoc organizations" are independent of existing organizations and networks. The actors are the most important source of information, including open and hidden intentions and problem solutions. Only information which really builds a decision basis and changes the resulting decisions is relevant for the planning process, and all other information is only a burden and hinders the process. The relevant information has to be used as a whole, including also unpleasant information. To find out what is really important, hypotheses have to be formulated at the beginning of the planning process. Therefore, the planning process has to start with a quick and dirty drafting of

different problem solutions in a greater context. “Ad hoc organizations” shall push all actors continuously to find solutions to problems. Information that is identified to be no longer relevant for the planning process is excluded. This is only possible in an open environment where different possibilities to act can be compared. The dropout of proposals is part of the game; only notorious sceptics and describers are reined in. As many overlapping problems are possible, they should be unbundled and delegated to permanent institutions. This practice does not exclude comprehensive, integrated solutions, but reduces the requirements on the coordination which releases potentials for tasks with a need for coordination (Scholl 1995; Maurer 2007).

- Clearly structured time schedule: A consequently timed procedure creates sequences of actions and decisions. The rhythm is specified by regular meetings where information and proposed problem solutions are exchanged between all participants and evaluated. The periods between these meetings are designated for largely autonomous and independent work of the various actors. Keep the time for general plenary discussions short. In plenary discussions, the risk of lengthy predictable monologues and escalating debates, which do not add value to the discussion process, is much higher than that in small groups. Therefore, the time in the meetings is structured in such a way that one quarter of the time is reserved for gathering knowledge, one quarter for debates and discussion and half of the time for drafting of recommendations (Scholl 1995; Maurer 2007; Tschirk 2012).
- Interdependent planning and implementation process: sequence of situations and actions. *Competition of ideas:* Competition helps to explore the range of solutions more deeply. The simultaneous work of different actors on the same topic includes the different knowledge backgrounds of the participants in the clarification process. Furthermore, by comparing the different results, the monitoring of the results becomes easier. *Professional competence before formal competence:* Professional competence shall be valued more than formal competence. All participants should be willing to give greater importance to objective arguments. The quality of the interpersonal relationships can be promoted by the selection of the participants according to criteria of professional competence and personal integrity. *Strategy and tactics:* Due to incomplete information and limited resources, difficult tasks can only be solved with strategy and tactics. Thereby, the distinction of strategy and tactics is important. If you want to act in a continuously changing and only partly manageable field, you need a guiding principle—the strategy—and have to be tactically flexible. The periodic description of problems and the discussion of priorities for further action are adequate tools to make strategy and tactics aware. *Simultaneous procedures:* Competition, planning and implementation have to be meshed; the processing and evaluating runs over the entire working period and parallel. This process requires continuous feedback and revision of plans. *Put the planning in a wider spatial context:* The competitions should not be spatially limited. Aspects which are lying outside the core area but have a central importance for the task should also be acted on (Scholl 1995; Maurer 2007; Tschirk 2012).

- Actors. Involvement of decision-makers: The information and participation of politicians in the process, in order to implement professional decisions directly into political decisions, is substantial. Involvement of potential actors and opponents: The inclusion of possible opponents in the process drives them to deal with a matter in an intensive way. The biggest conflicts occur if important actors are not informed and involved (Scholl 1995; Maurer 2007; Tschirk 2012).

8.5 Equality in MTIPs

Inadequate transport sometimes contributes to social exclusion, particularly for people who live in automobile-dependent communities and are unable to own and drive a personal automobile. In the Alpine context, with a limited and diminishing offer in public transport, this "mobility gap" or "accessibility deficit" affects people with low incomes, the mobility-impaired, the elderly and ethnic minorities and women more than men (Law 1999). In general, transport and land use policies and programmes could help to improve social inclusion, especially if the different implications for the people are taken into account and possible solutions are implemented. Furthermore, the access to resources is gender specific like time, money, skills and technology. The availability of those resources influences travel behaviour (e.g. number of trips, time schedule and mode of transport) as well as the experience and social meaning of mobility (Law 1999).

Gender mainstreaming—one strategy to achieve gender equality—started to get recognition as a worldwide political topic in the mid-1990s at the United Nations Fourth World Conference on Women (Beijing, 1995). With the Treaty of Amsterdam signed in 1999, the European Union declared the gender mainstreaming strategy as a main goal of their politics. Therefore, equality between women and men is incorporated into all community policies and programmes. It provides a strong legal base and incentive for all member states and the European institutions to further strengthen attention to equal opportunities and issues. Besides that, most national governments in Europe developed on the federal as well as on the regional level top-down strategies to implement gender mainstreaming into politics and administration. These attempts started in Austria in the mid-1990s. The peak of action was reached in mid-2000 with fundamental studies and projects.

In mobility, the gender issues are obvious and manifold. The demands and needs of women and men have to be taken into account when planning mega infrastructure projects. Thus, the diverse realities of women and men and diverse needs of people can be considered, such as:

- Trips: Men and women use different means of transport, routes and trip-chains depending on the employment
- Financing/affordability: Men use the private car more often than women, while women use more public transport, bicycle or walking

- Demography: Women live on average 6.5 years longer than men; in the group of the over 80 years old, they are the predominant proportion
- Usage: Women travel with young children (strollers) or dependent people (wheelchair) more often than men
- Time structure: Breaking down the time structures plays an important role, so different schedules require different services (e.g. for part-time commuters, retired persons, etc.)

"The research on gender and transport has made an invaluable contribution to the geography of gender, and to the geography of transport" (Law 1999, p. 583) and shifted the focus of transport and land use planning. In general, according to gender mainstreaming strategy, MTIPs should focus on gender issues in the following planning stages:

- Planning, process and design to include the needs of both genders
- Gender-specific data collection and analysis
- Balanced share of both sexes in the participation process
- Sensibility and awareness rising of stakeholders and decision-makers

MTIPs, in general, are best suited for large urban agglomerations and metropolitan areas (e.g. high-speed railways). Securing and communicating the added value for rural and Alpine areas is a huge challenge that Poly5 is dealing with. The approach of gender-sensitive transport planning helps to analyse, understand and include the different needs into policies, programmes and projects.

8.6 Gender Issues in Planning

Gender issues in planning tend to add a different perspective and special focus to the planning process. Gender planning requires the following questions:

- Who is concerned?
- What are the different needs of women and men?
- Which targets and measures ensure equal opportunities?

Basically, gender issues in planning and development are manifold and should be taken into account in all actions. Of course, some fields of interventions are easy to spot and very well analysed, such as the labour market, education, mobility or settlements. However, inequalities may also occur in fields like environment, water and waste management.

The integration of Austria's regional policy into the European Union's Structural Funds policy supported an increasingly stronger orientation towards cooperation and strategic concepts. The monitoring and evaluation of regional policy interventions gained importance as well as the number of involved stakeholders grew significantly. Women have always played an important role in development processes and regional planning.

Public life in Alpine and rural regions is traditionally dominated by men, such as in community clubs, in regular's tables ("Stammtisch"), in festivities and many more. So, they are very well organized and still it is much easier for men to protect their interests.

In small communities, it is a "prestige" job to be active in the political area because it does not provide for the living. Furthermore, rural areas are severely disadvantaged regarding institutional child care. The situation in rural areas is not subject to change according to the shrinking female population, traditional role models and the political system. In cities and agglomerations, the participation of women in politics is slowly growing and it needs to be strengthened.

Even among farm women, the phenomenon of a "leaky pipeline" exists. In 2007, 39% of all agricultural enterprises were led by women. However, with regard to the size of the enterprise, only 17% of enterprises comprising 200 ha or more were managed by women. In the central professional association for farmers, the Chamber for Agriculture, women are massively underrepresented. The presidents of the national agricultural chamber are exclusively male; within the local agricultural chambers, the share of women amounts to 15% (Bundesministerin für Frauen und Öffentlichen Dienst im Bundeskanzleramt Österreich 2010, p. 294). Top leadership positions in the large business and labour umbrella organizations also mostly remained in male hands. Although some progress was made, few women were present in the executive bodies of the Austrian Trade Union Federation, the Chamber of Labour, the Austrian Federal Economic Chamber and the Austrian Federation of Industries. This holds true for top management positions as well in business. In the largest publicly quoted Austrian companies in 2008, only 6% of the members of the highest decision-making bodies were women (Bundesministerin für Frauen und Öffentlichen Dienst im Bundeskanzleramt Österreich 2010, p. 354).

One of the biggest challenges in Austria is eliminating the gender gap in income. However, due to the divide in education and employment between rural and urban areas, an urban–rural income gap exists as well. "Average annual gross income of female employees decreases with a rising rate of agricultural employment in their place of residence while concurrently the gender gap in income increases to the disadvantage of women" (Bundesministerin für Frauen und Öffentlichen Dienst im Bundeskanzleramt Österreich 2010, p. 294).

In 2003, the fundamental study on gender-sensitive regional development was published (Aufhauser et al. 2003), financed by the Austrian Federal Chancellery. For the first time, spatial patterns of gender-based inequity were analysed. By now, those data are over 10 years old and were never updated. The authors came up with a long list of recommendations for a gender-sensitive regional development in the fields of politics, economics, culture, mobility, education, social infrastructure as well as funding policies and programmes. Unfortunately, the implementation of those recommendations was never monitored.

As global competition becomes tough, the regions need all resources for a successful development. Alpine and rural areas in Austria strongly rely on the concept of endogenous development enabling existing regional potentials with bottom-up processes. Yet, gender mainstreaming is not an integrative part nor it is really anchored in regional development processes.

8.7 Gender Issues in Mega Transport Infrastructure Planning

The introduction of gender considerations has implications for a range of transport policy areas. Within the European Union, the gender mainstreaming strategy (incorporating equal opportunities for women and men into all community policies and activities) is widely used to implement the gender perspective in programmes, projects and policies. Gender mainstreaming is a top-down strategy and focuses on the differing situations of women and men in organizational structures, process and workflow design, evaluating results and products as well as communication, public relations work, and management and control.

At the moment, "men's travel patterns are the ones which are represented in transport policy reports and decision-making as 'common'…" (University of East London, Wuppertal Institute 2006, p. iii). Transport policy within Europe still has deep and structural gender problems. "To classify differences between gender, it's necessary to reflect on the role of women and their covering of a significantly larger range of society's diversity of life situations of people than men (looking not only on skills learned by delivering caring work for other people, but also looking on the complexity of work patterns and histories of women), male travel patterns, which transport policy focuses on, are—relative to the whole population—very atypical, particular, different and deviant from the every-day-life situation of the most people and of the population" (University of East London, Wuppertal Institute 2006, p. iii). Current mobility planning focuses on paid employment as its main interest, since most trips appear to be made for this purpose (Sanchez de Madariaga 2013, p. 43). The innovative concept of "mobility of care" (Sanchez de Madariaga 2013, p. 43) proposes to give a priority to all travel purposes like education, leisure, shopping, visits, escorting, etc. This concept helps to rethink the investment priorities and to render public transport more responsive to users' needs. This means that the accessibility of everyday destinations needs to be systematically explored. Detailed information on how the various places are reached in daily life is needed. Travel maps to schools, colleges, areas of employment, shops as well as markets and other places of interest should be available to the travellers using public transport and should include information for pedestrians and cyclists. The use of the accessibility planning approach, as utilized in the UK, should be encouraged (University of East London, Wuppertal Institute 2006).

Gender mainstreaming has an outward and inward approach. A good practice example for the inward approach is the implementation of gender mainstreaming within the ÖBB Group (Austrian Federal Railways). The ÖBB Group is Austria's largest mobility service provider. Within half a year, the ÖBB Group succeeded in adopting a gender equality policy with concrete targets. The communicative and integrative process was driven and supported by a few promoters of middle management and the ÖBB works council. Finally, gender mainstreaming goals were adopted such as the integration of the principle of equal opportunities (gender mainstreaming and diversity management) in the organization of work and employment

policies of the company, the review of human resource processes to ensure that people (especially women) will not be denied to professions or management levels because of gender and internal and external media information campaign to disseminate information on positive examples.

However, the aspect of equal participation of women and men in the transport sector is off balance, since women still have less influence than men (Polk 2005). The overall question is therefore whether women would support the same measures to improve mobility as men. A Swedish study showed that "the largest difference between women and men is that women more often suggest proposals that would improve travel for other users, such as children, the elderly, and the handicapped, …" (Polk 2005, p. 186). So, besides the implementation of gender goals in mobility, the equal participation in decision-making is another field of intervention.

There are different approaches to integrate the gender perspective into transport planning: starting with the design of stations (e.g. master plan for the railway station in Bern/Switzerland), traffic planning considering care and leisure mobility (e.g. Hannover), security concepts (e.g. Hannover), information platforms for multimodal transport (e.g. Mobiltätszentralen) and many more. Summing up the literature on gender and transport, gendered patterns of daily mobility are identified and produce variations in:

- "mobility choices (travel demand, transport mode)
- mobility behaviour (purpose, timing, distance and duration, route, etc.)
- perceptions of mobility
- experiences of mobility" (Law 1999, p. 576)

To secure social inclusion—especially for Alpine and rural areas—those different needs (e.g. security) should be analysed and considered in every transport planning project—no matter on which scale: local, regional, national or transnational scale.

8.8 Gender Planning in the Alpine Context

In most of the rural parts of the Alps, society still follows traditional role models. Therefore, the "gendered norms of domestic responsibility, overlaid on temporal rhythms of childcare and domestic work, and on spatial patterns of segregated land-uses, and combined with inflexible service hours, and minimal public transport, generate time-space constraints that restrict the mobility of those responsible for this work (mainly women and mothers)" (Law 1999, p. 578). Besides the time–space constraints, safety becomes another issue when travelling outside peak hours. The gender and transport literature recognizes both issues, but lacks research on solutions, such as changing temporal rhythms of work and home life (Law 1999).

Keeping Alpine areas alive—particularly the lagging regions—is an important political task. Even though women crucially contribute to achieving this, little attention has so far been paid to the role of women. To maximize human resources in maintaining the social fabric of Alpine communities and revitalizing local econo-

mies, the full involvement of women is vital. In some regions of Europe, economic recession and cutbacks in public services have led to further rural decline, remoteness and poor infrastructure. In rural and peripheral regions, people face higher transportation costs (both in absolute terms and as a portion of household income) and longer travel distances to reach important activities.

Young people, and above all young women (mostly between 18 and 26), migrate to the towns and cities in increasing numbers leaving behind the shrinking regions and valleys with all their challenges. Educational participation of women over 18 years is less frequent in rural areas because of the concentration of higher education facilities in urban areas. In the long run, this leads to a higher average educational level of women in cities, which is further boosted by the immigration of highly qualified women from agrarian regions due to a lack of job opportunities at their places of origin. Within the past years, TV soaps like "Farmer seeks woman" or "Valley seeks woman" became popular acting as dating platforms in rural areas, but this is only the peak of the iceberg.

Nevertheless, "the female employment rate is high in mainly agrarian communities (69 vs. 62 % in Vienna, 2008). This, however, mainly reflects the high number of self-employed women—most of them employed as family workers in the agricultural sector. On the other hand the service sector, which generally shows a big share of female employees, is underrepresented in rural areas when compared to the cities" (Bundesministerin für Frauen und Öffentlichen Dienst im Bundeskanzleramt Österreich 2010, p. 294).

In conclusion, Alpine regions have similar structures and face similar challenges: limited and concentrated areas for residential structures, limited transport infrastructure in some regions, a relatively low female labour rate in general and men still dominating local as well as regional decision-making processes. For the successful international positioning of the Alps and for the competition between regions, innovative power and activation of human resources is needed. Besides the accessibility and mobility, the key factors for development are the women and men in the Alpine regions. Gender planning is an effective tool to support endogens development processes and visualize the different needs of people.

8.9 Lessons Learned and Recommendations

Generally, the question arises whether MTIPs would be "different" taking into account action planning and gender issues. Both principles bring in a different perspective as large-scale projects focus on existing inequalities and different needs of the population. In the planning stage, the pros and cons related to the gender impact of activities and measures are weighed (Hirschler 2009). Thus, it is conceivable that those perspectives will shift priorities. Summing up, taking into account action planning and gender issues is not an entirely new concept in urban and regional planning, but it contributes and stimulates the endogenous potentials. To secure a sound implementation, the following steps should be considered:

- Success depends on the cooperation of many stakeholders: In a complex planning situation dealing with complex major tasks for planning, no expert alone is able to solve the task. Even well-reasoned proposals often fail in major projects because they overlook facts and details from other specialist fields. The value of the proposal lies in the examination of its fruitfulness. Yet, the gender composition of institutions and decision-making bodies in transport infrastructure are dominated by male interests. Therefore, procedures and implicit rules of institutions focusing on gender equality have to be taken into account.
- The implementation also needs creativity: Creativity must not end with the planning process, but it should have an important position in the implementation process. The realization of a project is confronted with a lot of unexpected difficulties which need creativity and flexibility to be solved especially when they occur at the intersection of various fields (Maurer 1985).
- Transparency in the development processes: Transparency in planning enables the public to have a say about issues that matter to them and a chance to influence decision-making and hold those decisions to count. Simply making information available is not sufficient to achieve transparency. Information should be made available in sufficient time to allow analysis, evaluation and engagement by relevant stakeholders. This means that information needs to be provided while planning as well as during and after the implementation of policies and programmes. Information should be managed so that it is up-to-date, accurate and complete. The example on the ÖBB group showed that the transparent process (inviting all employees and regular communication via intranet and media) was a key factor for the successful implementation.
- Analyse and visualize the situation: Especially on the local and regional level, the lack of gender-sensible statistics is still evident. The situation improved since the year 2000; however, the data are not unusually visualized in the statistics. This also differs on the sectors. For instance, in demographic data, the gender aspect is already mainstream; however, there is little or no data on caring work and the travel it induces. To enhance the transport planning on mega infrastructures, the systematic gathering of data on travel needs and travel patterns should place caring mobility at its focus point (University of East London, Wuppertal Institute 2006).
- Key stakeholders and raising awareness: Not only in the sense of the "top-down" strategy but also in regard to the decision-making processes, it is crucial to raise the awareness especially of key stakeholders in the region. The more they know about the benefits of action planning and gender mainstreaming, the smoother the implementation processes will run. An increased presence of women in the transportation sector and in regional as well as city planning departments help to improve the sensitivity to gender issues in mobility (Sanchez de Madariaga 2013). Nevertheless, a gender neutrality of decision-making is yet far off mainstream and substantial changes in professional and/or institutional policies are necessary. The backbone on the decision-making for the distribution of resources should be gender-led, as gender budgeting should be introduced in transport policy.

- Clear goals: In MTIPs, different stakeholders are involved—from the political representatives of the organizations, the private sector up to consultants and, not least, the population in the regions. Clear guidance on the objectives and the necessary steps for a successful implementation will help all those involved in organizing their participation. Core criteria for the rationality and gender evaluation of future and upcoming transport policy could include goals like gender mainstreaming in transport institutions or improving the knowledge base on differences in daily mobility (University of East London, Wuppertal Institute 2006).
- Secure the experience and continue innovating: This seemingly simple argument relies on a central element in the development process, that is the transfer of knowledge. Even if there is no "recipe" for the implementation, it is crucial to learn from the experiences of other regions. The transfer of knowledge has two aspects—to pool resources within the region and outside the region. The European Union has contributed funding for the construction of countless networks. Through experience and know-how transfer, the wheel should not be constantly reinvented, but we should keep the wheel running and innovating. This implies that knowledge is made available and disseminated both within and outside the region.

8.10 Conclusions

As experience showed, a crucial factor for the implementation of action planning and equality in MTIPs is the contribution of experts in consulting for such projects. These information multipliers need to be trained and convinced that action planning and taking into account the gender issues bring an added value to MTIPs. Planning in Austria is based, to a large extent, on bottom-up processes. The concept of endogenous regional development activates the resources as well as potentials of the region and helps for self-help. In principle, the strategies—gender mainstreaming and action planning with their top-down approach and the endogenous development based on bottom-up processes—cannot be combined and are totally contradictory. In the planning practice, the concept of endogenous development also needs external incentives (e.g. funding, moderation and process design). So, at the end, it is a combination of internal and external as well as bottom-up and top-down processes that works for success. In the case of gender mainstreaming, the incentives came definitely from outside, thanks to the promotion by the European Union. Surprisingly, the theme was not identified by the regions themselves—even though human capital is a key resource for development. Obviously, this is one of the big challenges when it comes to implementation on the local level. Action planning and gender issues certainly contribute to a "better" planning, as they raise awareness and visualize the need of both—women and men.

Finally, the question on the added value for projects and plans is crucial. Is the city 2005 development plan of Vienna—dealing with gender mainstreaming—bet-

ter than those of the previous years? This question is difficult to answer. On the one hand, the added value of structural measures, such as parks, residential buildings and lighting concepts, is easily demonstrated. On the other hand, when it comes to strategies and principles, they are almost impossible to measure. Often there is a simple acknowledging of the presence of a value because of the balanced participation of women and men in the planning process. For the future development, a statistical proof of the added value is of course preferable. The same arguments support the action planning model.

The European Union implemented the cross-cutting issue in all funding programmes, but the programmes and projects are done by the member states, provinces and local authorities. Dealing with gender mainstreaming in the programme, application of projects and the implementation is seen more as a burden than an added value for the action. Furthermore, in the final funding decision, the criterion does not matter at all. Accordingly, it is difficult to convey the added value of gender mainstreaming in projects. In conclusion, action planning and the integration of gender issues are no "new" approaches in planning, but nevertheless they changed the perspective of planning and development policies in Austria.

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Chapter 9
Governance Approaches to Raise the Renewable Energy Source Share in Mega Transport Infrastructure

Hartmut Dumke

9.1 Introduction

This chapter introduces the spatial necessity to raise the renewable energy source (RES) contribution, especially in the context of major transport infrastructure (MTI) planning. Thus, an overview on the development of RES in the European transport sector is presented along with an evaluation of RES contributions, such as biofuels and the rise of electro-mobility, herein both traditional and new e-mobility vehicles. Thus, the spatial interconnection between the production potential for biofuels and renewable electricity and their consumers is discussed. A "steering matrix" is drafted to show strategies and possibilities (on different spatial levels and by different approaches) to raise RES shares in the transport sector. The chapter argues on the necessary policy changes, possible modalities and spatial level of applicability, concluding with recommendations for stronger links between RES policies and MTI planning.

9.2 Why Raise the RES Share in Regions Alongside the Alpine Corridors?

Alpine regions are environmentally and ecologically highly sensible. The capability to absorb emissions, such as greenhouse gases, particulate matter and air pollutants, is limited by their spatial quality and the extension of protected areas, which is larger than in flatlands. However, the dependency on private transport means is very high. Whereas public transport lines may be secured along densely inhabited

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"valley-agglomerations", this is not true just few miles away with significant impacts on accessibility. Thus, there is great pressure to empower sustainable intermodal transport solutions, especially in Alpine regions.

Among those solutions, one strategy holding great potential for a change may be the reduction of motorized individual miles and/or the rise of RES contribution on them.

Furthermore, the demographic trends in Alpine regions challenge the feasibility and sustainability of MTI projects. Also from a governance perspective, the complexity of decision-making, concerning coordination between a great number of involved stakeholders (also being entirely different in their cooperation values and resources, especially considering cross-border areas) and vertical as well as horizontal aspects in planning procedures, make MTI planning a wicked problem as mentioned by Fabbro in this book's introduction.

Thus, this chapter would offer a planning tool matrix that systematizes steering instruments to increase the RES share in transport by showing steering modes and their spatial core coverage. This empirical approach contributes on previous analysis results from European multilevel-governance reports which address a certain failure in multilevel coordination and territorial governance during transport planning processes.

9.3 The Development of RES in the Transport Sector

In recent years, mobility has gained more attention within the energy discussion worldwide. In Europe, especially the 20-20-20 targets (EU 2011) were a strong motivation to overthink national and regional policies herein. It definitely makes sense to "upgrade" the transport sector in the entire energy debate, being one of the main overall energy consuming sector. Usually, the transport sector in total uses an average of about 20–35 % of the overall energy consumption, with enormous regional differences, depending mainly on the consumption share of other main economic and private sectors (industry, services, domestic homes). The empirical data on the worldwide data values in transport show that the current RES contribution on the transport sector is currently still a minor one—around 2 % only (IEA 2011).

Currently, the two most important RES themes in the transport sector are the contribution from biomass and waste sources and the contribution of electricity. Often, the term "biofuels" or biomass fuels is used to describe a bundle of entirely different fluids and gases that are converted from organic matter into ethanol and biodiesel[1] (just to name the two main important fluids in the current global production), but there are also a lot of other options like fluid hydrogen and biogas (Bildungsinstitut PSCHERER GmbH 2010). Current European Union (EU) Commis-

[1] Both ethanol and biodiesel have the great advantage that the current combustion engines used in cars do not need any changes to "consume" them; this is not the case with many other biofuels, and this is a main reason why compatible vehicles so far have only a pretty small market relevance.

sion policies (European Commission 2009) aim to raise the RES contributions on the transport sector from 5.75–10 % by 2020. Measured in absolute amounts, the top five EU biofuel-producing countries are Germany, France, Austria, Spain, UK and Sweden—also with very remarkable relative growth rates between 100 and 400 % between 2005 and 2007 (Wikipedia 2012; Observ'ER 2012, 2013).

The second RES theme is the contribution of electricity to power vehicles by volts—both traditional electro-mobility (e.g. trains and trams) often technical solutions of an MTI, as well as the rather newly developed individual vehicles such as e-cars, e-bikes, Segways, e-scooters, etc. These "single vehicles" have just started to get a small but fast-growing market relevance, mainly thanks to e-bikes and e-cars (Wikipedia 2013). The precise RES share on the electricity used depends on the primary sources used in the electricity production with a range that can be between 0 and 100 %, as well as the dependency from energy imports which tend to be rather non-RES.

9.4 RES in MTI Means: Production and Consumption Aspects

Current biofuel shares, in the transport sector (worldwide average), are only around 4 %, and the electricity share herein—with unclear knowledge on the RES share in its production—may be under 1 % (Fig. 9.1).

Still this means an almost complete dependency on fossil fuels. How can this be changed in the future with remarkable success instead of small improvements? To

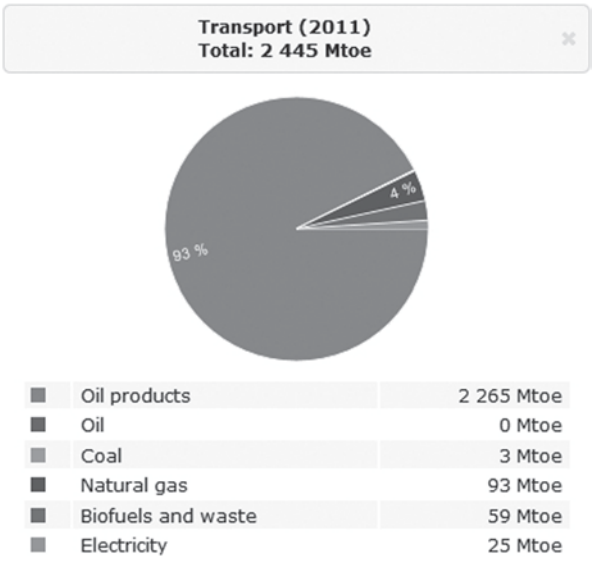

Fig. 9.1 Final energy consumption in the transport sector. (Source: IEA 2011)

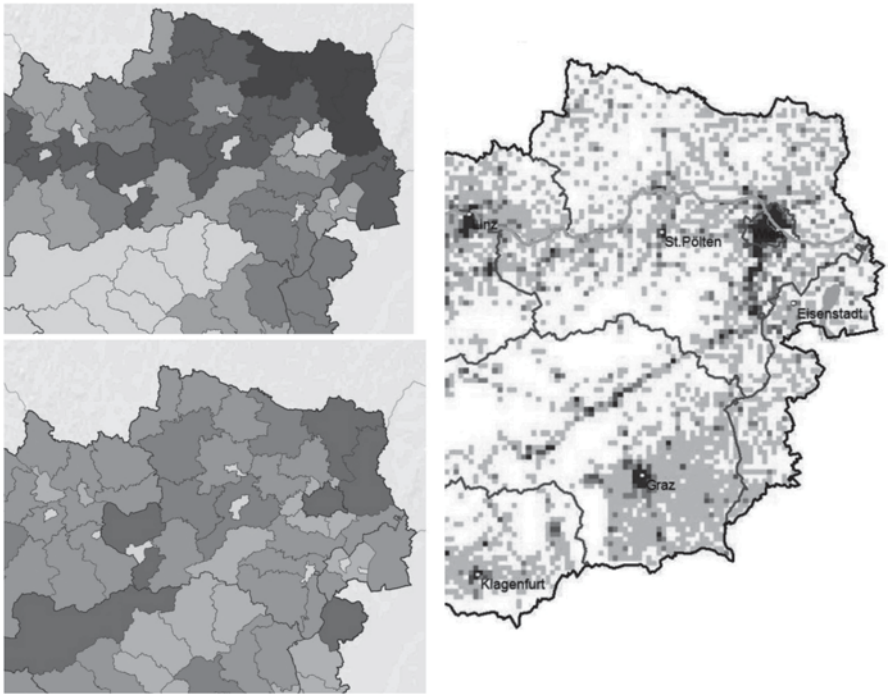

Fig. 9.2 Spatial relation between biofuel/photovoltaic production potentials and the "consuming" spatial patterns. (Source: Wonka 2010; ÖIR, EEG TU Vienna, Mecca Environmental Consulting, AGRAR PLUS (2010))

answer some of these questions and before going into steering and policy aspects, we need to look into the consumer market and where the spatial potential of biofuels and "clean" electricity are "consuming" large spaces. Unfortunately, there are only a few studies that rate the relation between the production and the consumption side on a small-scale level (small-scale meaning clearly "smaller" than single figures on the entire national level). As a key study, we could look to an Austrian study (Fig. 9.2):

The maps show clearly that RES development has great potential sites and would need a decent planning and steering among the stakeholders affected. There are countries which are clearly privileged with a rather low population density and, at the same time, huge RES development potential. Some of these countries already exceed the 20% target. Among them are Latvia, Austria, Finland and the "prime" RES player Sweden with 48% RES of gross final energy consumption (The Guardian 2010). Other countries hardly gain RES sources, just because of the dimension of their population, higher population densities and smaller spatial/biomass potentials. Among those countries are France, Italy, UK and Germany. However, these countries have set up ambitious RES growth rates for 2020. Another very

important spatial feature is the energy amount (GWh/a) that can be carried out per hectare used. For example, wind and photovoltaic (PV) electricity can carry out up to 1 Mio kWh per year, whereas the biomass fuel/electricity output lies around only 1/20 of the wind/PV output = 0.05 Mio kWh per year and hectare (Kaltschmitt 2009).

Also the "conversion chain" between biofuels and RES electricity is entirely different. Its major steps are the energy production from primary sources, the energy conversion and its consumption in grids, services and finally in single personal usage (individual vehicles and public MTI). Electricity has the advantage that a powerful and mostly area-wide service grid already exists. For biofuels, this is not yet given. Not to speak about the biofuel competition "against" food production on all spatial levels which should not be a global issue anymore[2] with the recent EU biofuel policies, which clearly turned into a direction to secure and support the sustainability aspects of any increased biofuel production (Observ'ER 2012).

9.5 Overview of Existing Steering Tools to Raise the RES Shares in the Transport Sector

In order to have a compact overview of the diverse steering tools available to raise the RES share in transport, the following Fig. 9.3 shows the state of the art, based on a Cartesian coordinate system with different steering modes on the *x*-axis and the spatial decision validity of impacts of those modes on the *y*-axis. Without claiming this graph (nor this chapter) to be complete on the available policies, it gives a holistic view of those useful for steering RES shares in the transport sector and—which may be even more interesting—also shows missing links in this steering matrix, which gives clear hints on necessary future policy[3] interventions or empowerments. Some recommendations regarding these missing links are summed up in the concluding section.

Figure 9.3 is a matrix illustrating important steering tools by their spatial level and by their impact mode, and it has been adapted from a 6-modes-scheme originally developed by Klaus Selle (Selle 2005, p. 120). The regulative, awareness and financing impacts are characterized by their indirect effectiveness, meaning that they (themselves) *do not directly change* the physically built environment. They rather prepare this implementation. Important examples in this group are "classical"

[2] Empiric evidence (global production level) seems to confirm that mass production of ethanol and biodiesel directly influenced or raised global market prices of corn and maize, but on the national/federal levels, this cannot be clearly proven, and also, farmers' associations really care efficiently for the sustainability and affordability of domestic food.

[3] In terms of governance, mainly the term "policy" is close to all kinds of steering impacts, whereas politics and polity rather describe the discussion and coordination processes in a certain involved political system (Schubert and Bandelow 2003).

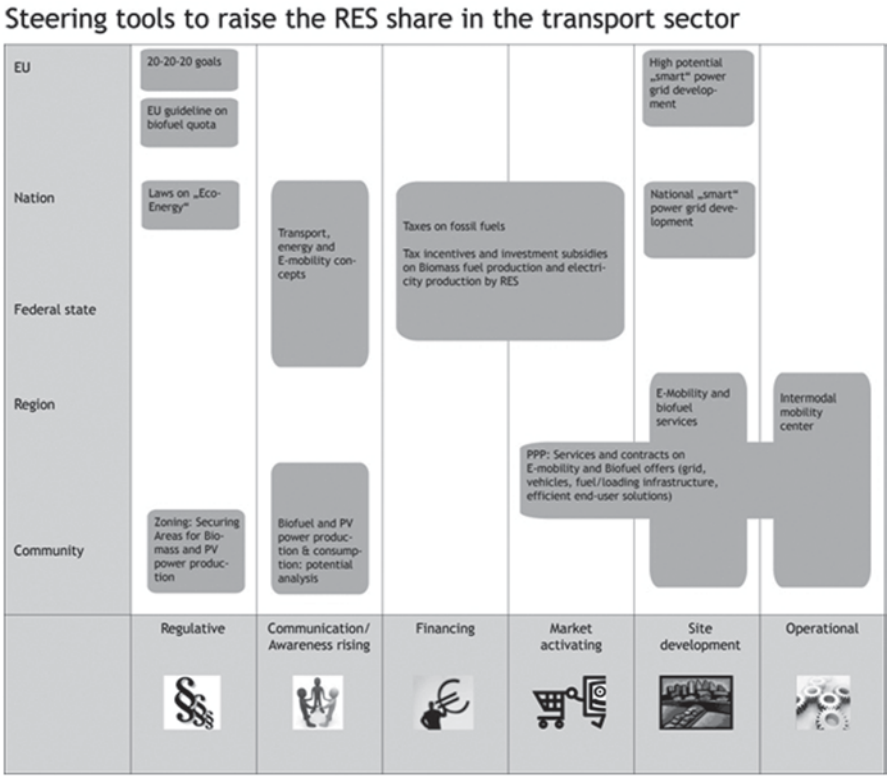

Fig. 9.3 Steering modes to raise the RES in the transport sector. (Source: Author's own elaboration)

zoning regulations, strategic concepts, planning laws and financial subsidies of all kind. The steering mode of these planning instruments is mainly hierarchical.

On the other hand, the market activation and site development *do directly change* or develop the physical environment. They implement. Important examples of this operational mode are treaties, public–private partnerships, evaluable declarations, site developments, infrastructure building and prefinancing. The steering mode of these planning instruments is mainly cooperative.

The remaining steering mode, operational tools are indifferent; they can be of both direct and indirect impact. Often, their existence prepares and/or secures the functionality of the other two modes. Thus, a "toolbox" is available, but Fig. 9.3 also shows where the gaps are. Both specifics are commented in the following chapter with recommendations.

9.6 Recommendations on New Policies to Raise the RES in the Transport Sector

The EU Level

It would be essential to combine static and average RES goals on the transport sector. Doubtlessly, both the 20-20-20 goals and the biofuel quota have already been effective. Static quotas, from a governance perspective, give clear and easy goals for conversion into national laws. However, EU member states are not equal—concerning their spatial structures, their population densities and their preconditions between spatial RES potentials if, for example, calculated not in theoretical, but in realizable RES shares per person or on the entire modal split. Thus, the "next" generation of EU policies should outline RES quotas in the transport sector as EU-wide average values or in a total EU realizable absolute amount instead of "top-down"-only quotas that are the same for each country.

The National and Federal Level

There would be need for more courage with binding regulative tools, closer connection between the taxation and funding of RES and non-RES, advanced base research and improved funding efficiency. There are several nationwide transport and energy master plans, also dealing with biofuel and e-mobility strategies on such scale. However, their character is seldom binding or regulative. This steering task is usually "delivered" down to the federal states—or from there, "down" to the regions—or from there, to the local level. A scenario with more courage on the national level would add more binding laws and regulations, but founded in a close development cooperation with the lower administrative levels. This development cooperation would also need more decent fundamental research on biofuel and e-mobility potentials. With biofuel planning, researchers point out that the triggering of the agricultural aspects by formal instruments is pretty different—because there are so many different plants and energy conversion paths; on the other hand, the informal governance is more flexible, but less binding than the "formal" way (Gaasch et al. 2010; Einig 2010; Arbach et al. 2013). On the fiscal strategy level, the funding efficiency itself should also be considered more often, more carefully and in longer time ranges, rather than on the typical "4-year election period limit", such as asking: "Where can I get the most CO_2 savings per invested Euro?"

Mobility Regions Powered by RES

There would be need of institutionalization. Actually, the regions should have the "perfect" size for mobility planning. Where mobility measures are unsolvable on

the local level alone, the national/federal level is also too large, heterogeneous, inactive or inconvenient as a mobility planner. Figure 9.3 displays clearly this "regional gap" with the steering tools. Unfortunately, only a few regions are institutionalized on being a regulative, administrational and financing player. However, how can such an institutionalization be done, changed or initially created? Some success experiences come from the Swiss mobility concepts of the "kantonale Mobilitäts-Richtpläne" (roughly to translate as "district mobility guideline and plan) and teach what it takes to be successful in such institutional reforms:

- Each spatial level (national, regional, local) defines measurable goals that are evaluated and published frequently. The cooperation mode should not be a top-down hierarchical steering, but a bidirectional "fair" negotiation mode.
- Each level does fundamental research on the concept topics, and results are publically, transparently and completely available for everyone. Research and implementation progress are exchanged over all spatial levels.

As best practice example, see "Kantonaler Richtplan Basel" (Kanton Basel 2010).

The Local Level: Think Intermodal, Public–Private and User-Friendly

Independent from all other spatial and administrational levels, the community level is and will stay essential for direct participation processes with single or grouped citizens, NGOs and the local economy players. It was mentioned already that large-scale biofuel production is a rare thing on the agenda of communities, but with successful e-mobility concepts, some lessons are learned and success factors can be named for the local level (Vorarlberger Elektroautomobil Planungs- und Beratungs GmbH 2013; ÖBB-Holding AG 2013):

Before the implementation, decent base researches (on the best matching spatial structures) were done. Single e-vehicles are restricted from their possible distance range per day, which currently ranges between a maximum of 20–30 km/d (e-bike) to around 120 km/d (e-car). This means that the e-mobility system works clearly better in spatial environments that do not need far distances, which do not limit, but encourage the e-mobility system compatibility on urban or semiurban settlement patterns. But also in the so-called "rural" environments, there are a lot of unknown or unused mobility corridors and behavioural consumption aspects that would match on specific e-mobility services.

The successful e-mobility concepts so far have had an intermodal and highly user-friendly approach, easing the combination with other MTI means (mainly the existing public transport services, trains, busses and trams) and offering "all-inclusive" packages that, for example, allow the entire usage by a single monthly price for *ALL* services, both public transport and individual e-cars. This logistic construction often included a close cooperation with a private service company by public–private partnerships—because only few communities, maybe the larger cities only, can finance and run e-mobility and/or transport services economically.

Obviously, the economical and impact success of such e-mobility concepts seems to be empowered by long and intensive participation processes on general mobility issues for communities and regions. Governance analysis is still not on the "default" development agenda of mobility concept research; this should and can be changed in order to know about the qualitative "human" socioeconomic aspects as a crucial part of mobility strategies with high implementation impact.

Independent from the Spatial Level

It is essential to avoid acceptance of inefficient spatial patterns and to revitalize functional mixes and the "short ways". The history of the urban sprawl is partly also a history of a failed spatial efficiency—meaning not the planning goals, but their implementation. Generic traditional goals of planning laws/concepts are highly connected to spatial energy consumption—but this is not represented in efforts or base research on how to revert/redesign inefficient existing spatial settlement structures into spatially efficient ones.

How to Match RES Policies with MTI Planning

Having outlined some recommendations on the multilevel policies to raise the RES share in the transport sector, there is still to be mentioned that RES policies may help MTI planning, especially in corridors involving huge-scale transnational connections with maritime routes.

Hereby, ship cargo transport in general appears to be rather underrated. Maritime and river ship lines may be slow, but their costs from an environmental viewpoint, no matter if calculated in CO_2/t or in fuels/t, are superior to any train or road transport vehicle. Notwithstanding research gaps on the technical capability of existing and/or new ship motors to be powered by biodiesel or other biofuels, there certainly is potential to develop ships and boats powered by "green" electricity.

To conclude, there are still a few issues regarding European railways and vehicles powered by fossil fuels that would need to be addressed. First, it could be an improvement not only to define the intermodal links on the European level but also the minimum standards of their transnational frequency and capacity levels[4]. This would lead to a clear increase in the train passenger traffic shares. Second, it could be effective, although problematic in multilevel governance, to have a minimum of common tax standards at the EU level. In particular, a binding guideline to change the tax charge system from flat annual charges to fees by kilometre could be helpful to go more into the "principle that the polluter should pay".

[4] So far, this goal is not even true if evaluated "only" on national train links.

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Chapter 10
TEKNOSS: A Territorial Knowledge Sharing System in the Poly5 Framework

Igor Jogan and Felice Ferrara

10.1 Introduction

As it is frequently pointed out in the pages of this book, decision-making processes and procedures in spatial planning are becoming more and more complex in present days. This statement applies to national and regional contexts, but it is even more so for large infrastructure projects that have a transnational extension, such as major transport infrastructure (MTI) projects (MTIPs) along European corridors. Institutional complexity derives from a difficult coordination between regional planning institutions—considered usually the most important decision makers in European countries in managing special development—not based on clear and certain rules, but rather on the good will of the stakeholders involved. Who does not remember the process that was launched more than a decade ago when EU institutions tried to address the problem of spatial planning at continental level (CEC 1999)? Who does not bear in mind the subsequent period of animated discussion that lasted several years after the release of the European Spatial Development Perspective (ESDP) when most of the European planners were involved in trying to figure out the best way of coordinating different national or even regional planning systems and the huge literature produced on the matter (among many: Faludi and Waterhout 2002)? Apparently, this process has been considerably slowed down by the global financial crisis and its drawback on the world economy. Now it appears as if no real progress has been done in order to facilitate the processes that have to coordinate decisions that are taken at different levels and in different places at the same time (Doria et al. 2006).

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There is a further and even more pressing issue besides the problem of coordinating different stakeholders and decision makers. The experience of the spatial design of the Mediterranean Corridor in Italy has shown that greater cooperation is needed between decision makers and inhabitants. The unexpected opposition to the project in the Susa Valley offers the occasion to rethink planning decisions, which need to be transparent from the very beginning where no decisions should be allowed without the 'blessing' of the population involved. Even though one may harbour some doubts about the authenticity or rightness of these protests, there is no question that better tools of communication should have been put in place in order to transform the public decision-making process, where spatial decisions are produced, in a sequence of acts based on the sharing to the possible extent of the existing and sometime conflicting views.

In the introduction of this book, the editor clearly highlights the so-called 'criticalities', or even 'failures', of the multilevel system and transnational governance. Concerns brought by the empirical evidence of how things are going in this field, along with personal beliefs about the future development of planning techniques, convinced the authors of this chapter that in planning processes the most important issue to be addressed is related to *knowledge sharing*. Knowledge sharing is required between different levels of government, between different regions, between decision makers and their citizens. So, knowledge sharing should be considered to be the most challenging issue for a situation like the transnational planning of a transport corridor that implies the participation of many stakeholders in many different regions and that relate to the livelihood of millions of inhabitants in different countries.

Why knowledge sharing and not simply information sharing? A short answer to this question may be found in the following statement: While information is a more technical substance, knowledge implies values, beliefs and viewpoints that are in planning practice, those that 'make the difference'. As such, knowledge could be the 'medicine' that may heal through learning processes the 'wounds' produced by conflicting views. For this reason, it represents a choice of strategic value that has to be put on the table around which negotiation takes place (Healey 2007; Innes and Booher 2010; Von Seggern et al. 2008).

10.2 Approach and Methodology

The information and communication technology (ICT) research in the past decade will be probably remembered for having revolutionized the way in which services are provided through the web to users (Berners-Lee et al. 2001). This revolution is based on the following features (Davies et al. 2002):

(i) Web services are gradually replacing the stand alone, workstation-based tools.
(ii) Semantic web technologies allow for a much greater integration between the user's needs and the information or even knowledge supplied.

(iii) This increased interaction is due to a greater capacity of semantic systems to manage complex problems thanks to the newly developed languages that introduced machine-readable capacities.
(iv) The final outcome of this revolution is that now we are able to produce systems that allow us to collect, manage and distribute knowledge relative to a specific domain through the web.

The major advantage of this renewed technological scenario is, on the one hand, the decline of those web services that are based on one-way interaction model (consultation of databases) between the information available on the web and its end user and, on the other, the naissance of new semantically enriched systems that are indeed based on two-way interaction model (knowledge management and knowledge sharing) where the user contributes directly to the creation of the wealth of information and knowledge that she/he is going to share with all other users of the system. What makes in this case the information being transformed into knowledge is the new kind of technology applied (knowledge base, KB) that consist in a method of storing information according to a predefined conceptual structure, called 'domain ontology'[1], that is, the one guiding all the operations (storing, browsing, managing…) that are normally performed on the *KB*.

To achieve the aforementioned objectives, a *semantic wiki* software (Maged and Boulos 2009) has been adopted as a baseline technology. In short, a *semantic wiki* combines benefits from two main waves in the current web technologies: social networks and Semantic Web. The former enables involved stakeholders to share contents in a collaborative, bottom-up fashion. The latter provides the ability to capture, organize, evaluate and infer knowledge about the information brought by the pages, as well as the relationships between pages, in ways that can be effectively browsed and queried. Semantic wikis have being increasingly adopted in multiple domains with encouraging results.[2] The great potential of these systems is that of supporting learning processes and for this reason a type of interpersonal (or inter-institutional) exchange that can help overcoming conflicts, fostering negotiations and supporting deliberative processes, where the outcome is not 'precooked', but stems from the interaction between the stakeholders involved. However, given the recognized complexity of policy-making domains, the real challenge of our work is related to the elicitation, conceptualization and formalization of the underlying knowledge models (including the associated possible inferences) and the planning and implementation of the best approaches to feed, query and leverage the resulting KB for the purposes described above.

[1] In computer science and information science, an ontology formally represents knowledge as a set of concepts within a domain and the relationships among those concepts. It can be used to reason about the entities within that domain and thus to describe the domain. For more information, see http://en.wikipedia.org/wiki/Ontology_(information_science).

[2] See the many systems of this kind available on the page: http://semantic-mediawiki.org/wiki/Wiki_of_the_Month.

10.3 Territorial Knowledge Sharing System (TEKNOSS)

TEKNOSS is a web platform[3] developed as a methodological activity within the framework of the Poly5 project. As it has been said in other parts of this book, this project aims at improving Alpine areas accessibility through opportunities offered by the realization of MTIs within the Trans European Network for Transport (TEN-T) programme. The main purpose envisaged by the working team was to construct a system to provide decision makers and designers of the concerned infrastructure with reliable information about the ongoing processes in the territories represented in the KB and produce complex interregional scenarios. From these scenarios, one could learn what is actually happening along the corridor, what are the processes and stakeholders involved, how do approaches change from territory to territory and finally what could be the desirable actions aimed at improving cooperation.

This system was conceived particularly for those that would like to learn from the experience of other stakeholders that contribute to the formation of the KB. TEKNOSS represents the main output of Work Package 4 (WP4) of the Poly5 project under the responsibility of the Department for Civil Engineering and Architecture (DICA) at the University of Udine.

The implementation of TEKNOSS follows the objectives set out in the application forms of the Poly5 project. In these documents, it was stated that the main objective of WP4, within which TEKNOSS is developed, was represented by the assembly of an 'integrated model for MTI planning and implementation in the Alpine areas'. It has been also stated that this model should respond to the following requisites:

- It has to be generated on the basis of a cooperative approach to the issue of sharing knowledge between all relevant stakeholders implied in the project.
- It has to produce scenarios aimed at reducing the chance of adverse effects in the development of MTIPs in Alpine areas.
- Finally, it has to assist the authors of the system in defining visioning approaches that would integrate MTI planning through desirable (national, regional, local) polycentric scenarios and correlated implementation strategies.

Besides the fact that there is still much to be done in the field of Semantic Web approaches applied to spatial planning and that many obstacles still remain, probably due to circumstances where facts fall short of intentions, particularly in a subject area such as planning where it is quite difficult and costly to establish new and more effective procedures and methods of discussion and knowledge exchange, in TEKNOSS the user will find what can be considered as a first attempt of constructing an integrated model. In particular, this model is remarkable for the challenges posed by the decoding of knowledge in contexts, such as that of the Poly5 project, with several cross-border territories and a planning environment with a plurality of stakeholders and levels, where elements of complexity are not only represented by

[3] http://poly5.uniud.it/mediawiki/index.php/Main_Page.

Table 10.1 Poly5 survey structure. (Source: Authors' own elaboration)

AA The territory	AA1 Area profile
	AA2 Baseline statistics
	AA3 SWOT analysis
AB The project	AB1 Preliminaries
	AB2 Earthworks
AC Process	AC1 Actors
	AC2 Institutional tools
	AC3 Consultation
	AC4 Implementation procedure

different languages but also by diverse planning traditions and styles (Fabbro and Haselsberger 2009).

Having illustrated the technological options, a new knowledge sharing system for MTI planning encompasses three major components: (i) content, (ii) structure and (iii) functionalities.

1. KB Content

The working team has drawn from different sources in order to form the content of the KB. The most important of these sources was a survey launched at the very beginning of the Poly5 project (December 2011) among those partners[4] having responsibilities in spatial planning.

In particular, the aim and scope of the survey were to return, for all the territories concerned, an accurate description of the (i) feature of the territories crossed by the MTI (see section AA of Table 10.1), (ii) the actions undertaken in order to produce the preliminary documents, such as plans, feasibility studies, assessment reports, public decisions at all levels of government, along with the first layouts of earthworks (see section AB of Table 10.1), and (iii) finally, the information related to the procedural part of the MTIP (see section AC of Table 10.1).

[4] LP, Province of Turin which has developed a Strategic Spatial Plan for the areas interested by the Lyon-Turin high speed and high capacity (HS/HC) railway line in response to continuing social tensions and is continuously monitoring the situation.

PP2, Regional Development Agency of the Ljubljana Urban Region which acts as regional body for the implementation of national decisions and has since long addressed the issues linked to MTIs and the way they impact locally.

PP3, Veneto Region which is the highest local spatial planning authority in the territories surrounding Venice. It has been distinguishing itself for the incessant engagement in the discussions related to the alternatives of the corridor.

PP5, General Board of Savoie is an active member of the steering committee for the Lyon-Turin HS/HC line. It has promoted the Démarché Grand Chantier, which provided a set of actions supporting the implementation of the French section of the Mediterranean Corridor.

PP7, Municipality of Šempeter-Vrtojba (Slovenia) represents local community instances and has cooperated at cross-border level on transport and connectivity issues.

PP8, Province of Gorizia has cross-border experience in dealing with projects related to MTIs, expressing the administrative link between regional and local needs.

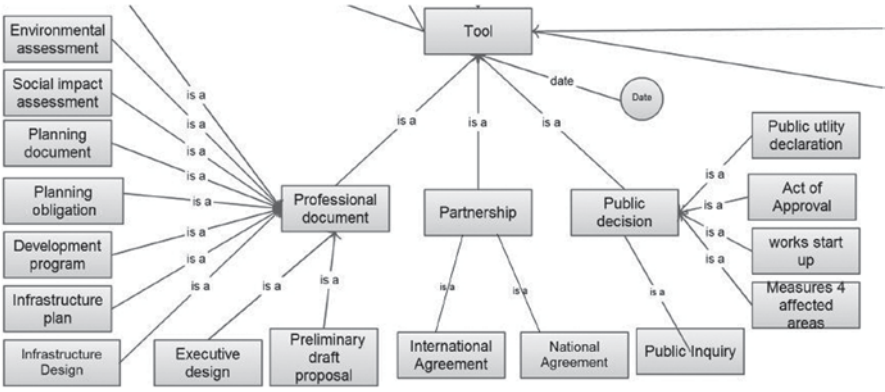

Fig. 10.1 Detail of the Poly5 knowledge tree. (Source: Authors' own elaboration)

It is important to note that all partners had to completely fill in part AA of the info-sheets, while parts AB and AC were supposed to be compiled only to the extent to which progress was done in the correlated activities. Besides the narrative type of information collected, also the geographic information linked to the topics mentioned above was gathered in order to enrich the outputs with suitable spatial representations. This information had to comply with the standard of the web application chosen for the construction of the KB. Thus, the survey took several months to be completed (summer 2012).

Furthermore, other sources of information relevant in forming the contents of the KB were consulted through research carried out at DICA (University of Udine) and with the collaboration of other project partners.[5] These sources were used with the aim of composing a general framework in which single territorial scenarios could be produced. For this reason, survey data needed a special hosting environment.

2. KB Structure

The structure of the system is represented by the semantic relations existing between the single items of the above-described content stratified in layers of information. Each piece of information (instance, page) is supposed to be linked to its 'ancestor' instance and to its 'descendent' instance and, according to a predefined hierarchy of concepts (classes), to its semantic identity element (class) that along with others constitutes the conceptual framework of the knowledge domain reproduced. In Fig. 10.1, a fragment of the ontology that was built is illustrated. The logical network specified refers to the concept of the institutional tool dealt in the survey part AC. Institutional tools are produced by stakeholders or 'ancestors' like private and

[5] Transpadana, partner PP6, has made available all the analyses produced so far on the traffic flows in the area of the Mediterranean Corridor.

public institutions (out of the picture) and refer to the phases of the planning and implementation process (as well as ancestors out of the picture). The linkages represented in Fig. 10.1 simply refer to the 'descendants' of the main concept-class that is the institutional tool. A document like this can be divided in three sub-concepts, further divided in other conceptual components. Thus, an 'environmental assessment' tool belongs to the family of 'professional tools' which is part of the big family of 'institutional tools'. Each level of this structure inherits the features of his 'ancestor' and adds to his level some new ones. The KB consists in defining the features of these classes and the type relations between them. Classes are then populated by instances, that is, by pages describing specific tools pertaining to different regional territories.

This structure that is usually named the *ontology* of the KB is commonly known as the 'knowledge tree'. The ontology has to comply on one hand with some basic linguistic standards and, on the other hand, with the specific vocabulary rules and conceptual definitions pertinent to the knowledge domain which refer to planning and decision making (Hopkins 2001). This ontology is usually built on the basis of a strong cooperation between domain and ICT experts and can be defined using different and widely tested approaches (Cristiani and Cuel 2006).

3. Functionalities

Ontology and data are entered into a shell that is usually supplied by one of several open-source resources available on the web (e.g. semantic wiki application or other databases). This shell will offer two types of functionalities: basic and advanced.

Basic functionalities are those that will allow storing the data in a filing system according to the predefined ontology structure and rules. Narrative type of information (text) will be stored in pages or boxes (subpages), other type of string data will be stored in table format. Ontology will provide the links between ancestors and descendants (instances), between domain concepts (classes) and annotations (tags).

Advanced functionalities are mostly related to querying procedures. These can be of different nature. The simplest is a query based on logic relation built in the ontology, for example, 'return the decision tree of a certain partner's territory'. A more complex interrogation can be one produced on the basis of research criteria that focus not only on original data but also on the user imputed data (tags) that can tell the feedback received by the end user. Finally, a set of queries can be produced in such a way as to obtain a spatial representation of the researched parameters or interpretations, or conversely queries that are based on the spatial limits drawn on the map in order to reproduce the items that are contained within them.

Querying systems have been applied in order to produce learning scenarios where a spatial representation is associated with some meaningful test data along with the final interpretation of the area profile and with the methodological criteria on which this profile has been produced.

10.4 Development

To assure qualitative and effective achievements, a cooperative development methodology has been devised:

Kick-off The main classes and properties of the reference ontology were defined—adopting common ontology engineering tools and methodologies—by the core development team, whilst a restricted group of domain experts actively participated to the generation, annotation and consultation of specific wiki contents, in order to test the appropriateness of the identified ontology elements. The major sources of inspiration were the planning theory (Hopkins 2001), on the one hand, since the matter of MTI is mostly concerned with planning tools and procedures, and on the other, the European regulations in the field of public works that have so far encouraged member states to converge on a common language.[6] Once a preliminary draft of the ontological structure was achieved, an info-sheet was sent to the project partners with the purpose to complete a survey aimed at collecting the needed information. The survey itself gave additional inputs for the elicitation of concepts and relations.

Development After the first conceptualization of the ontological model, the resulting ontology was loaded on an ICT platform[7] to extensively generate instances (i.e. the wiki pages) and annotation (i.e. the links between these pages). The work involved new domain experts. Semantic wiki editing functionalities are also adopted to extend and adapt the underlying ontology classes and properties to collaboratively address possible emerging needs and/or lacks in the underlying knowledge models. The final aims of this phase were (i) to reach a high maturity level of the reference ontology and (ii) to model a first set of querying functionalities aimed at the quality check of the KB. The querying interface holds the responsibility of making the user aware of the issues at stake or better conscious of the gaps that separate real practice from the outcomes of ideal type policies.

Evolution A complete set of added-value functionalities, fully leveraging the reasoning capabilities and the available semantic annotation of the semantic wiki, were to be implemented and made available to an extended set of possible users. Evolution was sought in two directions: (i) the development of a geographic interface that can enrich the scenarios produced by the querying system in spatial terms (being territorial cohesion one of the prerequisites of MTI) and (ii) the extension of the system towards impact assessment functionalities that can enhance the appeal of our wiki in a long time perspective. These functionalities would represent a support for decision making and need to be tested into the chosen case study to determine the actual potential and impact of the developed tool.

[6] See http://europa.eu/legislation_summaries/internal_market/businesses/public_procurement/l22009_en.htm.

[7] This was based on Semantic MediaWiki application (http://semantic-mediawiki.org/).

10.5 Results and Perspectives

TEKNOSS has been developed starting from a collection of information that was gathered thanks to the cooperation of the Poly5 partners through a survey focusing on three major topics. This survey aimed at describing (i) the past, present and future trends of the Mediterranean Corridor; (ii) the profiles of partner territories crossed by such corridor; (iii) the planning and evaluation of project proposals on such territories and finally (iv) the progress done in designing and implementing the chosen MTI plan. Since the technology applied for the arrangement of the TEKNOSS is an open KB that can be expanded at any time to other topics related to the project, the areas of concern can be extended in the future by project partners to encompass other matters that will demonstrate to become relevant (i.e. social, economic and environmental impacts).

For the time being, the system allows the user to browse pages with the aim of:

- Inquiring the system in order to attain answers on the state of the art of the Mediterranean Corridor since its launching in the partner areas served (see menu item: Mediterranean Corridor).
- Understanding the profiles of the single territories crossed by the corridor (see menu item: Regional scenarios) as well as the similarities and the differences between them (see menu item: Transnational scenarios).
- Generating regional and transnational scenarios related to impacts that the EU project proposal produced at the regional level. This impact may regard the reactions of local planners and stakeholders and the extent to which, and the way by which, the project was implemented in the different territories (see menu item: Regional scenarios, Transnational scenarios).
- Finally, the user can query the system in order to understand whether there are new perspectives and objectives that can be met at the regional level, in accordance with policy assumptions defined at the European level (see menu item: User made queries).

TEKNOSS can constitute a relevant contribution to the implementation of an ‘integrated MTI planning model’ where available knowledge could be made accessible to those that need to understand what is happening in a local context with reference to what is happening in other areas involved by the same project and what is supposed to be occurring in order to fulfil the policy outlook of the project as a whole.

10.6 Conclusions

Considered as a first attempt of applying a new knowledge management technology to planning processes, TEKNOSS produced significant results. The most important is the one that provides us with tools to understand the differences between the actions that partners are embarked on, the impacts on their territories and the conflicts

that could hinder the pace of the involved processes. These differences may relate to the progress made in the single territories in planning, evaluating, designing, endorsing and implementing the MTI infrastructure, but may also refer to the description and analysis of the diverse decision-making environments or the planning traditions that distinguish each situation.

On the other hand, the system presents some drawbacks that should not be neglected. There have been issues regarding the multilingual setting. In our case, in order to make the information available to local population, the web pages were written in native languages and on top of these a standard online translation service supported by Google was placed. However, this solution was not considered sufficiently adequate by partners since the narratives were quite technical and would have needed a more personalized translation service.

Another issue is drawn from a more substantial problem. Most of the relations between the decision makers have not been yet explicitly defined, and the project itself did not encompass all the decision makers involved in the planning and construction activities of this infrastructure. However, even if they were, the relations would probably not be as clear as they should be in order to be modelled appropriately.

Furthermore, project partners were at best the spatial planning authorities who represented in some cases only a small part of the decision-making system. This is certainly a delicate matter that should have been considered more accurately when planning the KB. However, there is probably no ICT system capable of solving the problems of a sometimes contradictory design of institutional settings.

Despite these drawbacks, the authors of this chapter believe that this pilot experience, carried out within the Poly5 project, could be of great general interest. In fact, the model could be applicable to other situations where a complex multilevel decision-making process is put in place and where a high level of convergence is required by the participating stakeholders. The requisite needed is that stakeholders and especially decision makers are clearly defined from the beginning.

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Chapter 11
Preparing the Future: Visioneering in the Planning Process of Mega Transport Infrastructure

Sibylla Zech and Chiara Andreotta

11.1 Introduction

Major transport infrastructure (MTI) projects are extremely complex processes, having substantial impacts on many components of a territory, from the natural and built environment to the everyday life and social conditions of communities and on their relationships. They cause and require large changes in the reorganizing of space for living and economy, increasing the complexity and the uncertainty regarding each component. In order to deal with the typical problem of complexity, uncertainty and weak institutional capacity, a robust and flexible planning approach is required. The three crucial notions, introduced by Salet et al. (2013) in order to deal with the characteristics of complexity and uncertainty proactively, are "the institutional change", or rather enabling innovation and reassessment of the institutional setting, "the process of learning", or rather shaping a learning environment in which decision and action are not determined by dogmatic knowledge, and the need to "balance the generation and reduction of a variety of policy options", or rather the capacity to recombine the path of decision-making in case of unforeseen circumstances. Thus, the challenge to prepare a region for the construction of an MTI requires an approach able to create a robust and inspiring regional perspective that remains flexible during all processes of implementation. Particularly when the MTI becomes only a part of a multipurpose regional development strategy, it is necessary to frame and reframe the strategic mission, considering not only the consequences that are not directly tied to the functional purpose of the infrastructure project, but also ancillary interactive effects on the environment, economic development and settlement patterns (Salet et al. 2013).

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In the context of this theoretical framework, within the Poly5 project partnership, the Regional Development Agency of the Ljubljana Urban Region, in collaboration with the Vienna University of Technology and the University of Ljubljana, decided to apply the spatial planning tool "visioneering" to the setting of the MTI Corridor 5 (now Mediterranean Corridor) in the territory of the Ljubljana Urban Region (LUR). The case study has been presented in an international workshop called "Tracking the Ljubljana Urban Region", which permitted to explore and reflect critically the "visioneering" method in its complete application.

The method and term "visioneering" combines "envisioning", that is, how to develop a vision for the future, and "engineering", that is, how to design and engineer future reality. During the application and testing of this planning tool in the LUR, three main phases have emerged. The first is "grasping", that is, a phase of approaching and getting in touch with the territory; the second is "grounding", that is, the act to develop and get deeply in the vision by finding the milestones, the stakeholders and the target groups involved; and the third is "spreading", that is, the phase when the vision is to be shared, developed further and implemented in a backcasting procedure.

The conclusions show the tension between the theoretical background and the application of the method, reevaluating the analysis elaborated for visioning in planning by Shipley (2002)—This leads to the following closing statements: (1) visioneering is an innovative practice; (2) a clear vision of the future serves as a beacon to guide actions; (3) common visions of the future will inspire and motivate purposeful action; (4) the broader the involvement in creating the vision, the more effectively this vision will contribute to a better quality of life and spatial environments; and (5) the community is capable of and interested in creating future images.

11.2 The Approach

The objective of the "visioneering" planning tool is to design comprehensive and inspiring pictures of regions in order to stimulate the political, public and professional debate (Salzmann 2013, p. 57). While planning tools like forecasting, scenario techniques and spatial modelling are mainly based on quantitative geographical and statistical data, the visioneering tool assists to perceive and understand a territory and people on site by using mainly qualitative research methods. Visioneering connects creative design, communication and technical skills.

The word "visioneering" is the combination of "envisioning" and "engineering": in brief, the engineering of a vivid vision built on the citizens' participation, the stakeholders' opinion and innovative use of social capital. In this context, one of the spatial planner's tasks is to translate stakeholders' views into a suitable visual language which is quickly and promptly understandable by different addressees, for example, politicians and citizens.

The visioneering approach has been tested and applied in the Poly5 project within the framework of the European Alpine Space Programme on regions affected by

the Mediterranean Corridor. MTI is generally designed and constructed by engineers applying scientific knowledge, mathematics and ingenuity to develop solutions for technical problems. Regions—the areas affected by MTI—are planned and built by various stakeholders: private and public companies and enterprises, private communities, households and individuals, regional and local public authorities and administration units, consulted by spatial planners and architects. Methods in spatial planning and architecture use both technical tools and skills of engineering and socio-spatial knowledge combined by processes of creative imagination and design for models, scenarios and visions of a potential future.

In the multiday workshop "Tracking the Ljubljana Urban Region", contexts, scenarios and visions have been screened and designed by and for the LUR, involving the Vienna University of Technology and the Ljubljana University. The main goals of the workshop and the studies on the spot have been a useful application and critical reflexion on the visioneering method by developing clear visions for the future of the LUR. The role and function that visioneering might have in planning processes have received little attention in scientific and practical terms. This situation makes "Tracking the Ljubljana Urban Region" highly experimental, where planners, researchers and planning students get the chance to contribute to the scientific debate on spatial planning.

11.3 The Workshop

The task of the workshop was to create visions for the LUR for the year 2030. The incentive for the search of future visions was provided by the planned implementation of the Mediterranean Corridor in the LUR. By backcasting from the visions 2030, when the rail network is supposed to have been built and to have already influenced the region, the contribution to a planning toolkit would be shown. During the application and testing of the planning tool in the LUR, three main steps (Fig. 11.1) of the methodological approach have emerged: (1) grasping, (2) grounding and (3) spreading.

Grasping

The first step is to "grasp" the region from several different perspectives. This means to get in touch with and mentally dock on the territory. The rough scans and sketches on the structures, functions, relations and identities are done on site in teams of local and external experts in order to screen, outline and understand the region more in creative terms than by the collection of data. The main tools are field trips, public and informal meetings, design workshops and lectures with local authorities. A learning context is created in order to provide the opportunity to generate and select options throughout the whole process (Salet et al. 2013). The

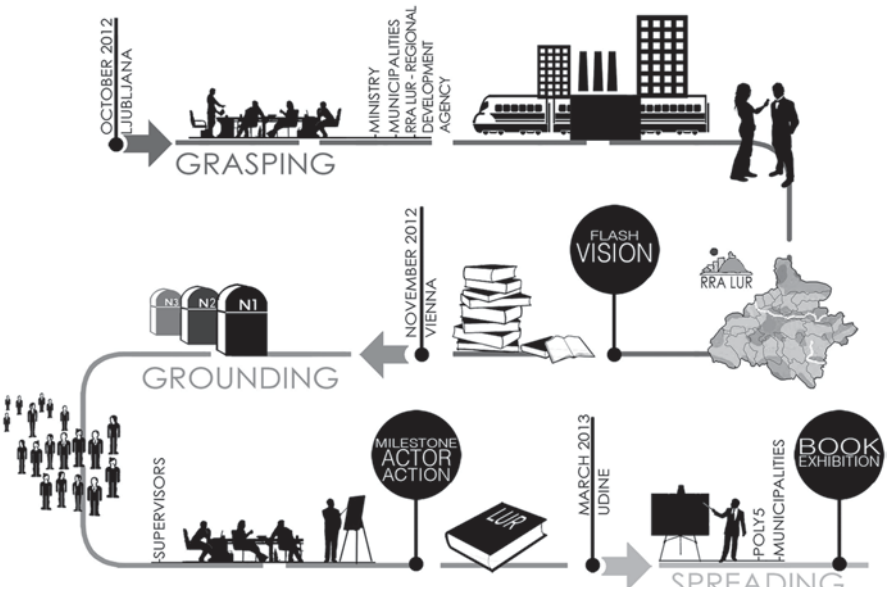

Fig. 11.1 The workshop process. *RRA* Regional Development Agency. *LUR* Ljubljana Urban Region. (Source: Authors' own elaboration)

first results are flash visions, brief and concise, and sketches of sudden ideas about future situations that emerge in the planner's mind which are to be visualized on posters and maps.

Grounding

During the second step, the vision is approaching the ground by screening and debating measures and actions in the perspectives of the visions and to set an indicative timetable. A planning process is characterized by several phases in which different planning tools are appropriate to be applied with the purpose of generating and exchanging the relevant project knowledge and information. The visioneering approach, in order to design a planning process, uses a backward-looking approach from a potential future perspective. The device that allows this approach is called the "backcasting" method (Quist and Vergragt 2006). It effectively facilitates to start from a possible situation in the future, represented by the vision, and comes back to the present. It allows to identify the steps to be set now to achieve future goals. This operation offers the occasion to discover the path of actions, signposts and milestones—to move forward or to avoid undesirable spatial development. Vision is thus seen as a guiding, not as a normative target point. Figuratively speaking, it is like a guiding star or constellation that provides orientation, but may not be reached.

Spreading

The third methodical step is spreading or disseminating the information, the transfer of knowledge to action. This gives another opportunity to discuss the vision, its strengths and potentialities. At this level, the vision is also a device that should stimulate public debate as well as the political and professional world. Presenting the vision in a simple and captivating visual language will raise awareness and knowledge about possible futures. The stakeholders and actors become motivated and active in building their future. The project organization should therefore continuously probe the context, solicit different views and seek confrontation with different actors, mobilizing the institutional capacity through an interorganizational empowerment in line with this mission (Salet et al. 2013).

11.4 The Visions

When going back in planning history, we find several urban visions focussed on new infrastructure systems in order to overcome or to promote urban and economic growth. Boulevards, ring roads, railway axes and stations were planned and built in order to improve urban conditions. The visioneering approach is not a rediscovery or reconnection to those optimistic nineteenth- and twentieth-century city visions. Many of the MTI-driven city visions had masked or ignored essential matters of the former, present and future reality. They have most often neglected or misunderstood the impacts on the countryside, the rural regions and the suburban areas. The motorways, built between the centres to the remote areas, pulled people and economic and buying power much more from the periphery to the centres than pushing investments into the regions. The railway stations were built at the edges of towns and rarely integrated as lively station quarters. Suburbs have been fragmented and environmentally damaged by MTIs. There were hardly any possibilities for local authorities and citizens to take part in decision-making on MTIs.

Participation on large-scale projects has been integrated in our legal frameworks only within the past 20 years (Environmental Impact Assessment Acts, EU Strategic Environmental Impact Assessment Directive, Aarhus Convention on Access to Information, Public Participation in Decision-Making). The procedures are often covered by the administrative burden, the complexity of technical details and the very sectoral points of view to avoid negative impacts. The applied methods do not leave enough space for strategic ideas to shape the future actively. Contrary to the usual assessment methods, visioneering takes up the optimistic thinking of planning with visions. While the current times are characterized by pessimism (economic crisis, weakness of European projects, cultural decline, climate change, etc.), visioneering encourages understanding, communicating and designing our living environment in a creative and open mind. The participants in the visioneering process do not fear the future; they act and communicate provocatively and attentively at the same time

by considering the fragility of the spatial system with the intention to improve resilience in a physical and social dimension. Instead of the—at first sight—more practical and incremental approach to change by "step-by-step forecasting", "visioneers" are ready to take one big leap into the future and develop the steps and activities deliberately backcasting from a future viewpoint.

The visioneering process was initiated by imagining year 2030 when the Mediterranean Corridor is supposed to be implemented and operative in the LUR. The question about the "public utility" of the MTI and the joint debate, whether or not there is a demand for the Mediterranean Corridor, was not the focal point of the research in the workshop. The MTI was seen more as a turning point for a more balanced development of the region, currently trapped between the attraction node represented by the Ljubljana city centre and the surrounding peripheral "dormitory" areas. This duality creates a high dependence on car trips in everyday travel.

The visioneering team put together the 2030 presence of the transport infrastructure and the LUR problems of today. The main topics which affect the region nowadays have been emphasized: the lack of a regional identity, the weakness of regional and international mobility and the necessity of an internal LUR cooperation. Four visions were built by the team as follows:

- The first vision is "The 20 minutes region": In 2030, every part of the region can be reached in a 20-min travel time. The accessibility is made possible by three organized levels of public transportation (Fig. 11.2).
- The motivation behind the second vision was to generate the future development of the LUR through international accessibility and mobility, that is, the "balkan hub". The LUR has become not only the gate and interface between Eastern and Western Europe but also the new connection between continental Europe and the Mediterranean Sea (Fig. 11.3).
- The third vision, titled "forever young", shows interregional young lifestyle, established by an ongoing circulation flow of human and social capital as well as experiences and activities (Fig. 11.4).
- In the fourth vision "LURMO", the Management Office of LUR, promotes and supports the 26 municipalities of the region in order to stimulate and guarantee an efficient cooperation (Fig. 11.5).

The structural relationship between the four visions and the MTI corridor becomes evident when backcasting the future position and potentials of the region. The strategic interventions cover main spatial and regional planning challenges, both the implementation of transport infrastructure and regional governance. The inner regional connectivity is going to be provided by a transport network with a completely new quality performance (vision "The 20 minutes region") and directly interacting with the establishment of the LUR as an attractive gateway with fast and efficient connections to the Balkans and Adriatic Sea (vision "balkan hub"). The vision "forever young" shows the potentials of a region that is no more mentally fragmented in municipalities but perceived and lived as a whole, a common place, in particular by and for young people. The forming of the regional identities is linked with the processes and structures for steering the region as shown in the vision "LURMO"—

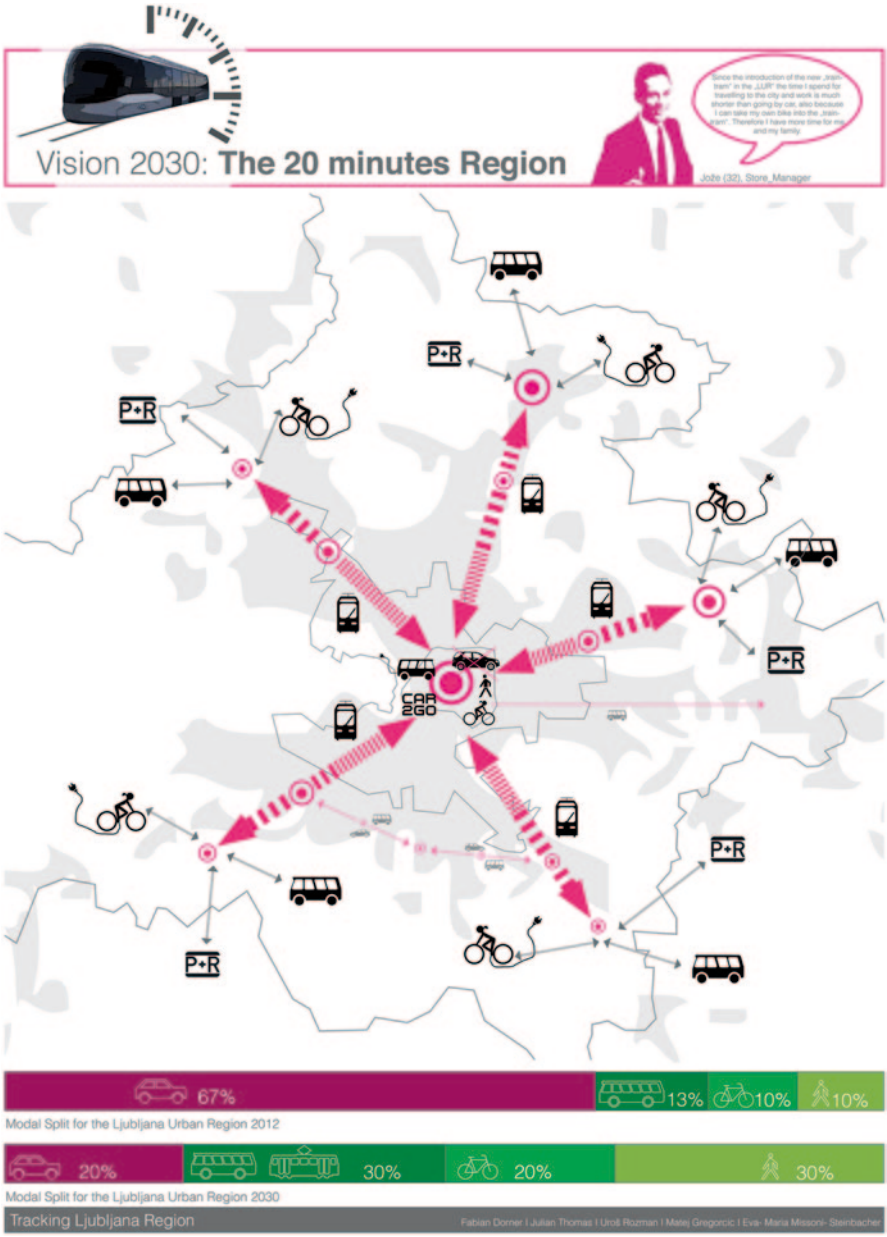

Fig. 11.2 Vision 2030 ''The 20 minutes region''. (Source: Zavodnik Lamovšek et al. 2013)

the Management Office of the region—as an institution of regional governance to structure the collaboration, to allocate resources, to coordinate activities in society or the economy and to force bottom-up processes. The visions are grounded by

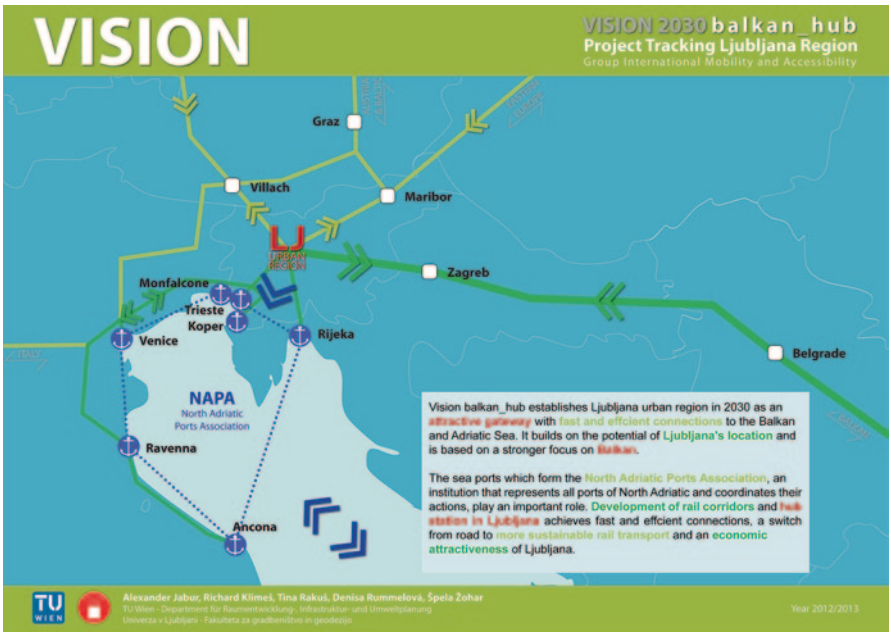

Fig. 11.3 Vision 2030 ''balkan hub''. (Source: Zavodnik Lamovšek et al. 2013)

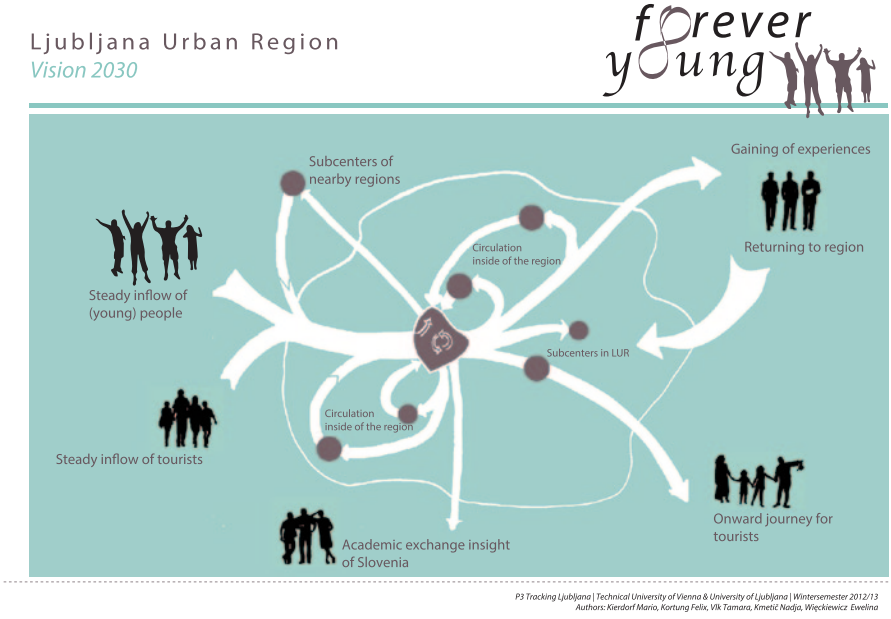

Fig. 11.4 Vision 2030 ''forever young''. (Source: Zavodnik Lamovšek et al. 2013)

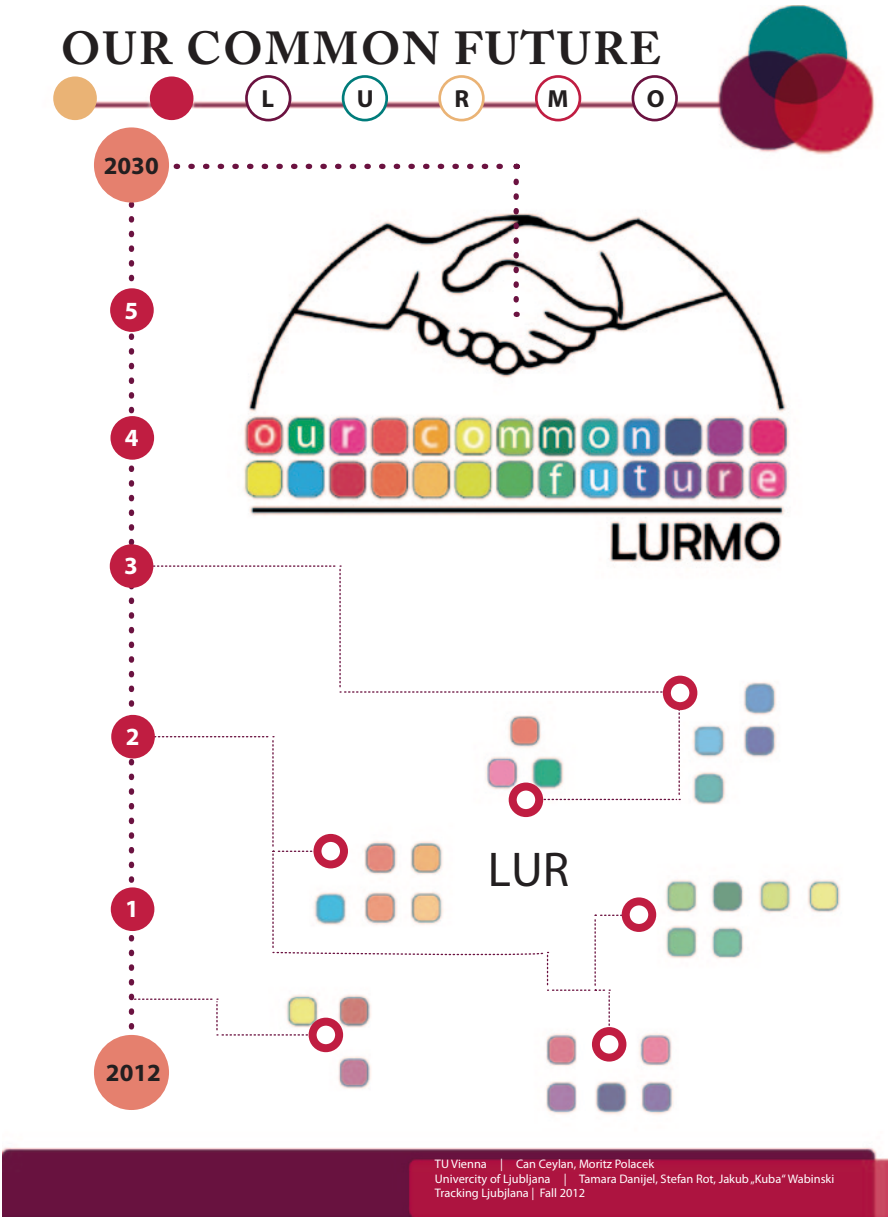

Fig. 11.5 Vision 2030 "our common future". *LURMO* Ljubljana Urban Region Management Office. (Source: Zavodnik Lamovšek et al. 2013)

indicating main strategic orientation to design and pre-evaluate MTI corridors by considering the future inner regional connectivity, internal and external places of movement and distribution, regional identity and instruments for cooperation and

steering regional development. This approach could be useful to root the MTI corridor since its early phases, and it could be taken up in the ongoing planning phases to give orientation in present decision-making.

The four visions for the LUR's future were supervised by the Slovenian and Austrian professors and then published in the booklet "Tracking the Ljubljana Urban Region, Student workshop 2012/2013", edited by the University of Ljubljana and the Regional Development Agency of the Ljubljana Urban Region. The case study was carried out only recently. Therefore, it is not possible to evaluate the results comprehensively. Nevertheless, some aspects on the strengths and weaknesses of visioneering for spatial planning can be pointed out, showing the tensions between theory and practice.

11.5 The Observations

The critical examination of the case study "Tracking the Ljubljana Urban Region" and the interviews with planners and the visioneering team have led to five statements about visioneering, statements based on the evaluation of the analysis elaborated for visioning in planning by Shipley (2012).

Visioneering as Innovation in Practice

The Mediterranean Corridor and the needs of an urban and identitarian region were the sparks in the LUR experience and brought up the idea to implement the visioneering approach. Contrary but also complementary to many other planning tools, for example, strength, weakness, opportunities and threats (SWOT) analysis, trend extrapolation and hierarchically structured goal "trees", visioneering focusses on interaction by designing visions. The vision—points in the future—shows a direction and not a set of choices. The vision is not a final plan or a handbook on procedures. There is no vision as a result, but as a continuous advancement on a path. The vision is like the Little Dipper, with the Polaris at the tip giving orientation towards whatever direction the sailor is heading.

Preparing future by visions is not a completely new approach in spatial planning. Even the "classical" procedures of planning include the step "vision" in the row of inventory, problem analysis, vision, principles, goals, measures, implementation and monitoring. In modern strategic urban and regional planning, this deductive approach has been abandoned in favour of an iterative interplay between orientation (vision) and implementation (project). The orientation of stakeholders is not given by detailed catalogues of targets and action programmes, but by visions and principles as an orientation framework (Kühn 2008, p. 233). In the case of visioneering, the spatial planning engineers bring up their visions to discussion in a very early planning phase. These visions are based on the professional abilities to read

space quickly, to perceive spatial phenomena, to grasp spatial interdependencies at a glance and to produce mappings.

The Vision as a Beacon to Guide Actions

Planning is the relation between knowing and acting (Friedmann and Hudson 1974). But how can the actions be guided and lead to sustainable results, considering that knowledge is always incomplete and often incorrect and actors do not want to be influenced in their freedom of action? Can visions of the future serve as beacons to guide actions?

A vision is a long-term purpose, which usually covers several decades. The visions as designed by visioneering give clear pictures, but are neither minutely detailed nor blurry. The visions shall attract the attention and produce a vivid impression, perceivable as a bright and distinct direction. The idea to give a direction means that when you deviate from the course—regardless of where your journey is heading—you can get back on the right path. The visioneering process requires precise and knowingly steps. The visions should be designed courageously and provocative. It is not the question if the vision is right or wrong; it is neither a scientific forecast nor a daydream prediction of the future. Nevertheless, it is fundamental not to confuse the vision and the plan, that is, the regulatory and agreement for action. It is not the vision to be implemented, but the plan, inspired by the vision. Visioneering is the investigation of a possible future by building a vision. A vision without a plan is just a dream, but a vision with a plan can change the world (old saying).

The aim of visioneering is not to create a universal and long-lasting vision but to help to shape and manage the change by the process of backcasting images of the future. A vision is often regarded with reservations as something light and evanescent, having just popped up and being neglected after a short time. This might be true to visions used as labels for marketing purposes (e.g., in the field of city marketing), which are usually not based on the professional knowledge about urban and regional planning and development. Visioneering is a planning approach for professional spatial planners ("spatial engineers") for a common understanding of our physical and social environment on a participatory basis and for playing a competent part in societal decision-making processes. The visioneering planner takes people's concerns seriously and is not covering them under a blanket of fashionable pictures. The participation of local authorities and the public in developing future scenarios as a part of the planning culture is not a guarantee but a certain assurance to state and fix the implementation of sustainable planning interventions. Especially in the planning process of an MTI, where construction timing could be very long, changes in social and political conditions are inevitable. To respond to these changes, new decision-cycles are started repeatedly, leading to an anachronism, in which, while going towards the vision, the vision itself has to be reconsidered. Similar to the strategic notion of the "generation and reduction of variety of policy options" by Salet et al. (2013), the visioneering method acts mainly as a beacon to guide the de-

cision-maker. Instead of driving the process of decision-making into narrow frames of thoughts and actions, the vision gives a direction which permits to recombine the paths of decision-making in cases of unforeseen circumstances (Salet et al. 2013).

The Vision to Inspire and Motivate Purposeful Action

The "engineering" part of the vision is the process of sketching, designing, drawing and illustrating the picture developed in the planner's mind and which was developed further by consulting stakeholders and the public. The future vision in the form of a map may show sites, areas, regions and networks, stakeholder constellations, procedures and timelines. The public is interested in maps. People want to see what is going on in their city, town or region, how the future might be and how they can participate in building it. Maps in a visioneering approach would be no more solely a normative picture, but a communication tool governing the process of spatial development (Zech 2013, p. 9). However, unconventional cartography provokes strong and controversial reactions. Examples are the spatial topographies elaborated by Diener et al. (2005) showing whole Switzerland as an urban entity with different urban zones that gave impetus for a discussion of the Swiss self-image of refusing urbanity. Another example is TirolCITY (YEAN et al. 2005), the vision on Alpine urbanization in Austria. Visions will inspire and empower actions, especially when the spreading act is insightful.

Participating in Creating Visions

The broader the involvement in creating visions, the more effectively this vision will contribute to a better quality of life and spatial environments. Therefore, visioneering also includes communicating about visions. Everyone, expert or lay person, has his/her own mental maps. Mental mapping with different interest groups, conducted by planners to make the individual imaginations visible, is a proven method in urban and regional planning. Mental maps bring up new perspectives on spatial development and enrich the engineering of visions and plans, as, for example, shown in the planning and participation process "Vision Rheintal" (Zech et al. 2006).

Visioneering shall both provoke and be mindful in the way of communication. This means to avoid an arrogant expert attitude (such as "knowing everything better") and to be aware that there is a high risk to develop banal future statements, which do not meet the professional requirements of the spatial planning discipline or are even ridiculous from the local point of view. An active gathering and sharing of visions—using the local knowledge (mind maps), future statements and desires—involves the aspirations and ideas of local communities. Therefore, public participation is necessary for the quality and lucidity of the vision and contributes to the understanding and consensus on implementation steps. In particular in the

spreading phase, planners need social competences to communicate, to elucidate the vision and to inspire people, but not to deceive.

The Capacity of the Community

Practical experience and scientific studies show that communities are capable of creating future images. They are interested in pursuing them as well as motivated by them. The ways to think about the future are individually very different. For some people, the anticipation of things that will potentially happen in the future is a strong motivator. Others are more likely to be influenced by their ideas about what happened in the past (Shipley 2002). This division between forward-looking and backward-looking thinkers is fundamental to highlight the necessity to have spatial planners who have the skill to work with a backcasting approach.

A limit for the visioneering approach is the time available for participation on the spot as well as for the visioneering team and the local participants. Therefore, the visioneering workshops have to be planned prudently in the rhythm of opening and concluding process phases.

11.6 Conclusions and Further Research

Visioneering is a phenomenological oriented approach. In planning, we may understand phenomenology as a comprehensive perception and screening of spatial phenomena, moving away from the abstractions and dissections of science and its proclaimed neutral objectivity. In this understanding, only those things and issues, which we can draw, sing about, describe, tell or sketch, or express in other means, can become a reality. The communication principle is not discussion (from Latin "discutere", to cut apart), but dialogue, an egalitarian conversational exchange. This process needs spatial planning experts with communication skills, tools and settings for interactive visualization.

The visioneering approach with its modus operandi to interpret the reality in a holistic manner goes beyond the analytical approach of data and forecasting in which the MTI is assessed mainly numerically. Visioneering rather operates with the idea to build the future together. It is individuated within the theoretical approach of creating a learning context in which different actors actively solicited, interact with each other in order to identify potential problems and solutions and find common grounds (Salet et al. 2013). Usually, the local and regional levels—people, businesses and local authorities—are involved only reactively in corridor planning and implementation. The common visions of the future and the "visioneering" of the road map for a possible future, at the local-regional level, are not just to reflect on track layouts and technical project issues, but are the moment in which the activation and participation creates a future-oriented public and political debate.

This chapter has discussed the relevance of a vision, that is, a construction of the future that indicates and promotes actions to be taken purposely, underlining what "visioneering" means: the application of experts' knowledge and engineers' skills required to translate a potential future into a readable and representable vision. Therefore, visioneering means the engineering of a shared vision.

Visioneering is an opener for the dialogue about the future of cities and regions without any fixed expectations regarding the results. The emerging visions are not binding for planning authorities, institutions, companies and citizens. Visioneering does not stand alone. It can support other—quantitative and qualitative—methods in a spatial planning process. However, the interfaces have not been adequately researched yet. Visioneering cannot replace other tools and instruments like territorial zoning, impact assessment and regional development strategies, but make them more vivid and anchored by promoting a planning culture.

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Chapter 12
Step-by-Step Design of a Local Spatial Strategy for a Mega Transport Infrastructure Project

Kristina Erhard, Michael Dross and Alain Thierstein

Mega transport infrastructure projects (MTIPs)—for example, high-speed railways—are often criticized for top-down approaches with a lack of vertical integration, high costs carried by taxpayers and lack of consideration of other impacts. Furthermore, such infrastructure projects are often presented as projects to reduce travel time through better connections, but often they extend infrastructure with insufficient traffic. Notwithstanding accessibility issues, little attention is given to environmental, social and economic impacts. As introduced by Fabbro (see Chap. 1), 'planning and programming of large infrastructure projects requires radical changes […] due to the current economic downturn and the general reduction of publically available resources'. So, it needs to be considered what benefits these areas would obtain from higher accessibility, what sorts of spatial developments are enabled through new infrastructure and what the general benefits or drawbacks for local inhabitants and the environment would be.

Thus, an approach is needed to analyse impacts of large infrastructures to enable local and regional stakeholders to learn about the benefits and drawbacks of a particular project, to allow local and regional stakeholders to join the planning process of MTIPs and to provide a tool for integrating the spatial impacts of new infrastructures into regional and local planning.

Fabbro comments in his introduction: 'coordination between European and national […] and between national and regional planning institutional capacities has failed'. In this chapter, we introduce a methodology which enables and supports impact-oriented planning, stakeholder orientation and a local and regional perspective on the benefits and drawbacks of a project. Firstly, we introduce the 'impact model' tool. Secondly, we demonstrate how an analysis based on strengths, weaknesses, opportunities and threats (SWOT) can be used to learn about opportunities and threats induced by transport infrastructure. Thirdly, we explain how our 'spatial

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strategy' approach integrates the findings of the SWOT analyses and develops future planning perspectives for regions and municipalities affected by MTIPs.

We describe our notion of a spatial strategy as a methodology and, therefore, as a product in practice. We implement a spatial strategy by elaborating how it is developed and how it can be used. As a methodology, it is exemplified by spatial strategies for St.-Jean-de-Maurienne near the city of Chambéry in France, designed by us in the course of the Poly5 project. Finally, we conclude that a spatial strategy designs an effective methodology that can be utilized within current planning approaches to overcome some of the faced challenges.

12.1 Introduction

'Spatial strategy' is an approach derived from the various concepts of strategic spatial planning. In turn, strategic spatial planning addresses the shortcomings of established forms of planning. The objective of strategic spatial planning is to shift the focus of involved stakeholders towards the long term while providing short- and medium-term implementation proposals that are geared to realize long-term goals. Although spatial strategy differs in detail from Fabbro's 'scenario building' and Salzmann's 'visioneering' (see Chap. 1), the common goal is the same: These tools construct possible futures by, firstly, defining potentials (or problems) and, secondly, offering solutions or possible ways to create a better or more sustainable future. However, strategic spatial planning is constrained by prevailing institutional structures that define its role and by legally defined standards that have to be maintained and that mainly address physical space requirements. Furthermore, established forms of spatial planning mostly do not integrate various kinds of stakeholders and therefore cannot be seen as bottom-up strategies. Additionally, the planned results are only rarely fully visualized. 'The interactions and concepts of regional planning often lead to complex, confusing representations that are only understood in part, if at all, by those who are involved' (Akademie für Raumforschung und Landesplanung 2011, p. 1). The decision-making processes are often non-transparent, owing to lack of communication. Established spatial planning approaches often fail to effectively analyse the dominant driving forces that shape space (Dross et al. 2012). Fabbro proposes 'planning tools to explore the future potentialities as well as engage in the construction of these futures in the interested territories' and further points out that 'the aim of these tools is, firstly, to deepen the discussion on some methodological features and, secondly, to equip the territories with planning tools capable of allowing promotion of their own "territorial projects" in order to somehow interact with the wider layout'. This 'interaction' in a certain territory is quite clear and detailed within the context of the 'spatial strategy' tool, in contrast to 'visioneering' and 'scenario building'. It is within this context of constraints that we have identified a need for our notion of a 'spatial strategy'.

In fact, a spatial strategy represents a bridge between knowledge and action. In particular, 'strategies' could mean a concrete set of actions. Thus, we define spatial

strategy as a sequence of impact-oriented spatial interventions geared to transforming a designated area towards a positive and evidence-based alternative future that is set at a sufficient temporal distance (Dross et al. 2012).

In the context of the Poly5 project, two spatial strategies are designed for the Mediterranean Corridor and particularly for the Lyon–Turin new railway line in the small towns of St.-Jean-de-Maurienne in Savoie and Susa in the Province of Turin. The reason for choosing this part of the corridor was the foreseeable completion of the Lyon–Turin railway. Consultation, compensation, consensus building and maximization of local resources are the themes that Poly5 addresses with the aim of minimizing the impacts and, primarily, maximizing the opportunities represented by the presence of a major infrastructure, whether it is in the planning phase, implementation or management after its construction. We argue that spatial strategy design is a methodology that can especially assist planners in breaking loose of the restrictions faced by spatial planning.

12.2 The Challenges of MTIPs

In order to get an idea of the current state of the art in high-speed railway connections and, thus, higher accessibility, it is important to review the critical issues of current knowledge, including substantive findings as well as theoretical and methodological contributions to the particular topic. Current literature about MTIPs in the Alps includes the following: Firstly, the academic evaluations of major traffic construction sites, like the Gotthard base tunnel, are mainly interested in more local developments at and around the construction sites, mostly applying the concept of sustainable development. In doing so, environmental effects of the constructions site are assessed along with the economic effects and social impacts on the resident population and the workforce employed at the construction site (MONTIRAF 2005). Secondly, a further focus in the academic literature is on the development of comprehensive measures that aim at reducing the negative effects of road traffic, while simultaneously enhancing the quality of life within the Alpine region (Bieger et al. 2004). Thirdly, scientific analysis aims at illustrating the present situation as well as identifying key problems and drawing conclusions on traffic and mobility in the Alps, mostly from environmental, social and economic perspectives (Alpenkonvention Alpenzustandsbericht 2007).

Along with the question of the general sustainability of an MTIP, higher accessibility, induced by such a major infrastructure project in a region, has not only economic but also social and environmental impacts. Nevertheless, the academic literature written in German does not intensively discuss the increasing transalpine traffic, which is induced by major infrastructure, or the increasing freight traffic. We may think of a couple of reasons for this: On the one hand, traffic was long seen as beneficial for peripheral Alpine regions, and, in addition, it was seen as an economically welcome factor. On the other hand, the intensified integration of European economies is manifested through the development of transportation infrastructure

across Europe, and that has become a mainstream line of reasoning without much critical academic reflection, until recently.

12.3 The Impact Model

The 'impact model' is devised as a tool that we use to make sense of and to visualize the assumed impacts of the railway track and the construction site. The impact model is based on expert knowledge and a literature review about the potential impacts. The assumption of the impact model is based on increased economic growth all across Europe, especially in the eastern member states, that overall induces a rising demand for transport infrastructure. Albeit the effects subsequent to the financial crisis are still felt, the European Union, as well as the Organization for Economic Co-operation and Development (OECD), forecasts economic growth for the whole European Union and especially in the new member states. In this regard, the admission of Croatia as a future member of the European Union strengthens the need for a better-developed railway network along the major transport axes of the European Union, especially in the southeast.

Of course, one may question the paradigm of continuous economic growth, but this impact model is intended to show the positivist side of economic growth and social benefits through the improvement of transport infrastructure. The focus is on the improved accessibility through the construction of a high-speed railway line within the Alpine region and to assess the economic, social and environmental benefits through the improvement of transport infrastructure.

The first loop of the impact model (Fig. 12.1) starts with the assumption of improved accessibility. This loop leads to an increase in the number of qualified workers. As a result, more firms invest in the region. The impact of the rising investment is a higher demand for transport infrastructure, and this in turn causes the operator of the transport infrastructure to rebuild or expand the railroad capacity.

Improved accessibility is also the starting point of the second impact loop. Firms are able to expand their economies of scale and scope, which enhances the regional and supraregional trade. A subsequent impact is that more workers and firms settle in the region, which produces a higher demand on the infrastructure and again causes the operator to expand the railroad's capacity. Improved accessibility also means that firms ship more goods by rail, which diminishes the use of the roads, and it means that the quality of life can improve due to less noise and less air pollution.

With the fourth impact loop, we address the increase in the number of workers and firms in the region. Such an increase results in a higher demand for public and private services so that the public and private suppliers expand their services. The supply of daily goods and services rises, and private households are able to supply them locally. Thus, people do not need to shop in other municipalities and the usage of roads declines. The improvement in accessibility allows a growing number of tourists to visit the region, which is represented by the fifth loop. More tourists will

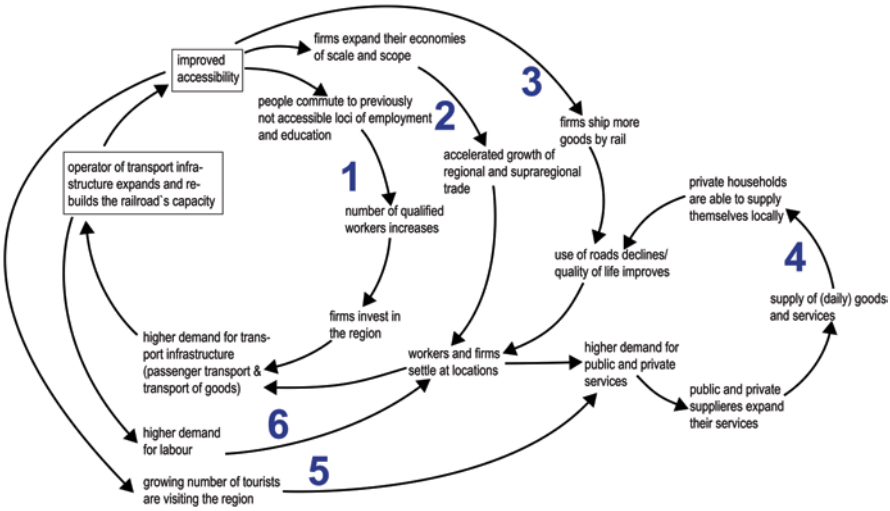

Fig. 12.1 Impact model. (Erhard et al. 2013)

boost the demand for public and private services, which drives the fourth impact loop.

The starting point of the sixth and last impact loop is the expansion of the railroad's capacity, which in turn signifies a higher demand for labour, so that more workers will relocate in the region. Moreover, this forces the fourth impact loop.

12.4 SWOT Analysis

In order to learn more about the alternative futures, development trends are analysed. The strengths and weaknesses confronted with trends result in opportunities and threats. For this purpose, we selected St.-Jean-de-Maurienne as case study, a city of 8000 inhabitants, near Chambéry, France. Following a general model, a first draft of the spatial strategies for St.-Jean-de-Maurienne was drawn based on a SWOT analysis (Fig. 12.2).

While strengths and weaknesses describe the current situation, opportunities and threats assess the future by considering the impact of external factors, such as demographic change, economic change and, of course, certain activities, such as the introduction of new infrastructure. The SWOT analysis for St.-Jean-de-Maurienne is based on four main topics: infrastructure, population, employment and qualification. These topics are derived from a classification of secondary data analyses. The data were collected during an excursion in the area of St.-Jean-de-Maurienne and through review of existing literature. During the field trip, the four main topics were evaluated via interviews, collection of further data and on-site excursions. The key

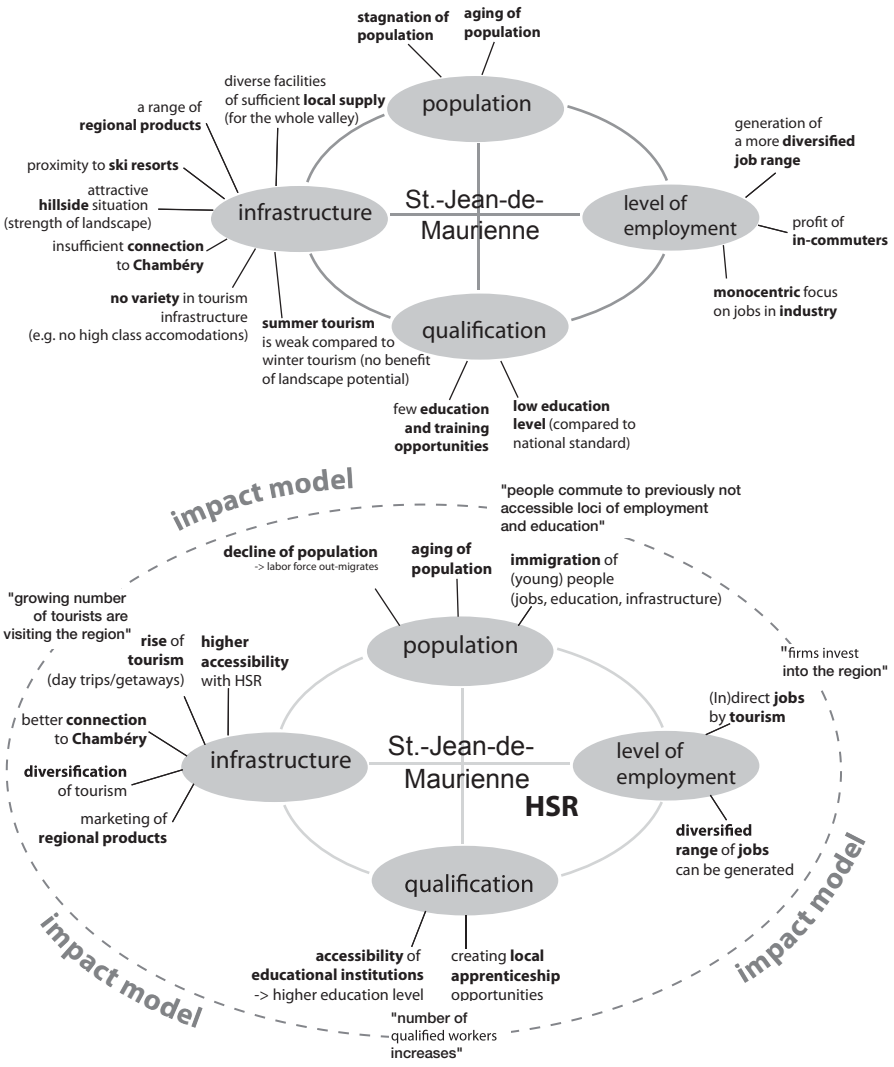

Fig. 12.2 SWOT analysis for St.-Jean-de-Maurienne. (Erhard et al. 2013)

driver was the new infrastructure, represented by the high-speed railway and a new rail station in St.-Jean-de-Maurienne. As the second driver, the city of Chambéry was taken into consideration with its research institutions, knowledge-based service industries, high-tech industries, a vivid tourist industry and high living standards. However, the SWOT analysis also reveals weaknesses, especially the lack of job opportunities, the stagnation of the population in this remote Alpine area and the lack of modern tourism infrastructure. On top, we identify dispersed settlement development, car-based traffic and a number of locations of heavy industries, such as

electrochemical plants and aluminium refining, located far away from high-quality public transport and without specific place-based qualities.

12.5 Spatial Strategy

A strategy serves the purpose to indicate which interventions are needed to achieve a relevant objective. To choose the most promising interventions and alternative futures, knowledge about the main drivers of spatial development and future development trends is essential. The basic elements of strategy are an 'accurate understanding of the real situation, choosing realistic goals, a focused orientation of available strengths in goal direction and a persistence of action until significant results have been achieved' (Albrechts 2010, 1118 p.). Fabbro explains the difference between scenarios, visions and strategies: 'While scenarios and visions represent the bridge between knowledge and action, strategies represent the concrete set of actions that allow, in a more limited time and space according to the available resources, to pursue some of the actions deriving from a general spatial vision' (see Chap. 1). Developing any strategy involves the following steps: analysing existing conditions, choosing a realisable goal and proposing a sequence of activities to reach it. Similarly, developing a spatial strategy involves the same steps to get to the foreseen future condition.

In the case of St.-Jean-de-Maurienne, the most obvious driver of spatial development is the new high-speed railway station, which is to be built on the outskirts of St.-Jean-de-Maurienne in a formerly highly industrialized area. Based on the assumption that higher accessibility through the new high-speed railway line has a positive effect on the area, the construction of a new station in St.-Jean-de-Maurienne is the initiation point for the spatial strategy. Our suggestion is to use the new station as the main urban transforming device or driver towards an alternative future. To create as many spillover effects as possible, we suggest building a mixture between a station and a hotel. As a further physical intervention, a cable car might be built to connect the hotel at the station to the centre of the village to ensure a fast link between the station and the city of St.-Jean-de-Maurienne and further up the mountains. This enables a certain vertical integration and the optimum use of space. We believe that vertical integration of station, city and mountain areas is the precondition for reaping the positive impacts of the new high-speed railway. Without vertical integration, the impact of higher accessibility would only be limited to the station and its vicinity.

Selectivity is an important feature of the alternative future. A spatial strategy does not define all possible alternative futures. For a small city like St.-Jean-de-Maurienne—not growing but rather losing population and full of agricultural land mixed with housing—useful questions would be: Which developments are possible for the area? Which role could the city assume for the wider region in the future? Which urban functions are to be developed/wanted for the area? Would a development towards urbanity be desirable? The opportunities and threats have to be accu-

rately considered given the general trends and challenges, such as the demographic decrease, climate change and scarce public finances—especially in times of credit crunch, stiff public budgets and spending cut.

The third step proposes interventions which are needed to ensure the intended alternative future for St.-Jean-de-Maurienne. The most crucial question about interventions is to assess what their impact would be. In general, an intervention produces more than one impact, and at this stage of spatial strategy making, it should be asked whether the intended impact—with regard to the alternative future—will be generated with a particular intervention or whether other interventions would deliver the desired impact more effectively. Figure 12.1 illustrates the general impact of the expansion of a railroad for high-speed rail. The expansion triggers improved accessibility. This impact allows certain activities, for example, people to commute to previously not accessible locations of employment and education. This activity triggers a further impact so that the number of qualified workers increases. From there it follows that firms invest in the region, which produces a higher demand on transport infrastructure. These impact chains need to be carefully estimated since it has to be considered whether the impact chains will induce or generate the alternative future or not.

The spatial scale has to be considered with respect to the area for which the spatial strategy is set up. Interventions might only be possible for this particular area and not on a broader scale. This would be an area-based approach, where the goal is to set up a strategy for a certain area and to apply interventions in this area and nowhere else. Alongside the construction of high-speed rail links from Lyon to St.-Jean-de-Maurienne—where the tunnel is about to be built—certain impacts, side effects or spillover effects derive, which might affect a broader scale. Thus, the impacts are to be considered accurately while designing spatial strategies (Fig. 12.3).

Spatial strategies use strengths to minimize threats. For example, the newly built main station in St.-Jean-de-Maurienne might be useful to allow more high-speed trains to stop. More people would have access to the city and also be able to commute workwise to other destinations in the designated area, for instance, Chambéry.

The first draft of the spatial strategies to set up a new high-speed railway station, inclusive of a cable car connection to the village and up the mountains, was discussed with the Province of Turin and the General Board of Savoie in a local workshop. Several stakeholders attended the workshops. The feedback given was adopted in the final version of the spatial strategies for St.-Jean-de-Maurienne and city of Susa. Still, the spatial strategy for St.-Jean-de-Maurienne is not ready for final implementation. However, the spatial strategies proposed are intended as suggestions for using the opportunity given to intervene and choose an alternative future within a certain time frame, in this case for the year 2030 (Fig. 12.3).

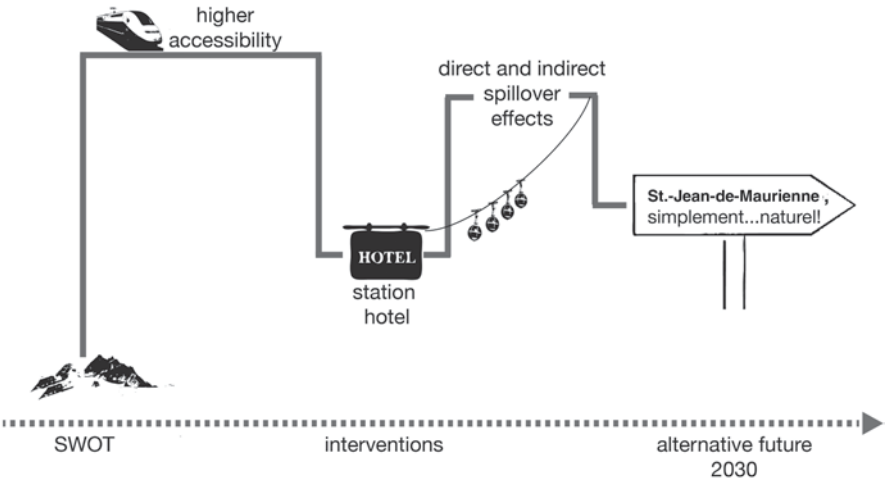

Fig. 12.3 Potential sequences of interventions. (Erhard et al. 2013)

12.6 Conclusion

An airport or a high-speed railway can be seen as pure infrastructures or as key drivers of a strategy to create spatial development. Thus, the 'crucial question is whether such projects have primarily an infrastructural function or whether infrastructure is considered to be the lever or the urban generator for a multipurpose spatial development strategy' (Salet et al. 2013, p. 1986).

Our methodology helps to understand and highlights the broader framework of an infrastructure project—such as higher accessibility through the construction of a high-speed railway station. Benefits of the outlined methodology reside in its impact orientation, starting with building an impact model. By creating an impact model, the impacts of critical developments and key drivers are revealed so that spatial and other interventions can be implemented. The impact model as well as the SWOT analysis and the design of spatial strategies are concrete tools for dealing with the spatial impacts of increased accessibility in a region. As Salet et al. pointed out, 'one should not only focus on the infrastructure effects of a new railway, but consider ancillary effects on the environment, economic development and settlement patterns' (2013, p. 1992). Spatial strategies can show a possibility—sometimes even a controversial one—for exploiting these impacts and turning them into something positive for the region. Thus, it guarantees a 'shift from a narrow, functional, instrumental goal to a more complex set of interaction effects tied to multiple goals' (Salet et al. 2013, p. 1992).

The workshops with stakeholders in Chambéry and Turin demonstrated that spatial strategy is a method for stimulating a fruitful discourse about the future of Alpine regions and meeting the needs and concerns of local and regional stake-

holders. Spatial strategy forms a starting point for creative debates and therefore is an appropriate way to deal with prospective developments like a new high-speed railway. Spatial strategies in fact can be designed by local people as a discursive process and enhanced by the integration of external experts. Therefore, spatial strategy is an important tool to consider decision-making as a process of *learning* and *experiencing* 'instead of the implementation of solutions given *a priori*' (Salet et al. 2013, p. 1991).

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Part II
Local-Regional Experiences Along the Corridor

Chapter 13
The *'Démarche Grand Chanter'* in France—How to Reduce the Impacts of Mega Transport Infrastructure Projects and Enhance Territorial Development

Bernard Barnéoud

13.1 Introduction

Given the magnitude of infrastructures such as the Lyon–Turin rail link, their implementation represents a potentially powerful driver for development of the crossed territories, during both their construction phase and their future utilisation. However, experience has shown that such construction projects rarely result in as many positive impacts as initially expected by the territories and the promoters of the infrastructure. At a time when local authorities and territories are increasingly recognised for their primary role in spatial planning, it is no longer acceptable to impose an infrastructure on a territory without accompanying it with due consideration and a well-thought-out policy to integrate the infrastructure within the area concerned. This is precisely the objective of the Lyon–Turin *Démarche Grand Chantier*[1].

The Lyon–Turin rail link is divided into three mixed sections for the transport of freight and passengers (Fig. 13.1):

- A French section from Lyon to Saint-Jean-de-Maurienne
- A cross-border section from Saint-Jean-de-Maurienne to Susa-Bussoleno
- An Italian section from Susa-Bussoleno to Turin

Located at the intersection of the north–south and east–west European axes, it involves the construction of a 57-km international tunnel, which will provide a low-altitude, horizontal route through the Alps. The Lyon–Turin rail link will constitute an essential part of the Trans-European Transport Network, ensuring better communication between the economic centres of the Rhône Valley (France) and the Po Plain (Italy) and greater connection with new member countries of the European Union. At the same time, it should facilitate the redistribution of flows towards less polluting modes of transport.

[1] 'Major infrastructure support plan'.

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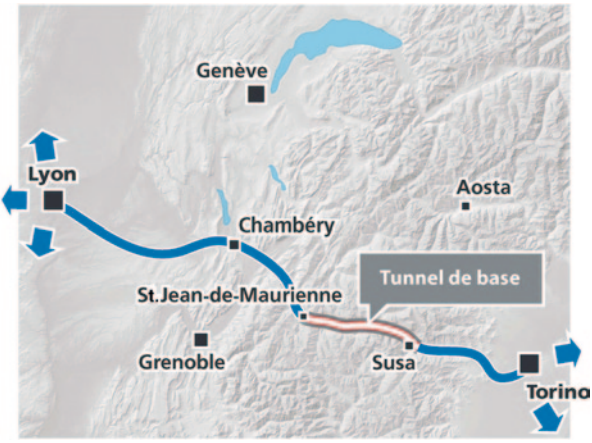

Fig. 13.1 Map illustrating the proposed route of the Lyon–Turin rail link. (Copyright LTF)

The new infrastructure will facilitate exchanges for merchandise and passengers alike. It will complete the European rail network, by linking around 250 million inhabitants and by connecting 5000 km of new lines as well as the major rail freight corridors. On the east–west axis, it is a key section of the 'Mediterranean Corridor', which will link Seville (Spain) to Budapest (Hungary).

Adequate advanced preparation for the start of construction work on the Lyon–Turin rail link is vital. This is one of the important lessons learned from previous major construction projects carried out in the *département*[2] of Savoie (France), such as the preparations for the Albertville Olympic Games and the construction of the A43 motorway in the Maurienne valley.

The aims of the Lyon–Turin *Démarche Grand Chantier*, which was established by the French government at an Interministerial Committee meeting on spatial planning and territorial development (CIADT) in 2003, are to prepare for the launch of the construction sites in the Rhône–Alpes region, to provide the necessary support as the construction work progresses and take full advantage of the economic opportunities it provides for the local area, and finally, to prepare the local area for the post-construction environment.

The Savoie General Council is heavily involved in the Lyon–Turin European rail link project, its priorities being not only the successful completion of the infrastructure work but also optimisation of the related economic benefits for the areas concerned, including the Alpine valleys.

For these reasons, it was one of the originators of the Lyon–Turin *Démarche Grand Chantier*, an approach which recognises the sheer scale of such infrastructure projects and 'consists of coordinating and anticipating the measures needed to facilitate the hosting of large-scale construction works by the territories, taking into account the impact of these works on local development. The planned actions con-

[2] One of the three administrative divisions in France, between the administrative region and the commune, roughly equivalent to the 'county' in Great Britain.

cern land use, accommodation, employment and training and support for companies and for the environment'[3].

Through the work of the Grand Chantier project team ('*la mission Grand Chantier*') and its technical partners, the *Démarche Grand Chantier* has built a strong body of research, analysis, deliberations and proposals, which now enables it to initiate the stakeholder participation process with the different territorial representatives and socioprofessional stakeholders concerned. This is taking place via the consultation committees established at the *département* level, in Savoie and Isère, and also through local consultation activities.

13.2 The Démarche Grand Chantier in Context

What is the role and what are the limits of the *Démarche Grand Chantier* in the complex context of a major infrastructure project, such as that of the Lyon–Turin rail link?

The overall situation is most accurately represented by a series of tunnels of increasing size (Fig. 13.2):

- The central hub of the Lyon–Turin rail link is the infrastructure to be constructed
- The first tunnel represents the preparations to ensure the technical success of the construction sites

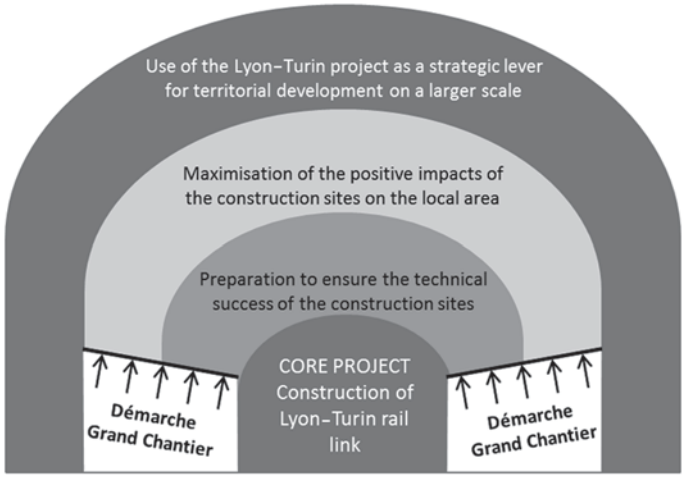

Fig. 13.2 Overview of the Lyon–Turin rail link project. (Source: Grand Chantier project team (Bernard Barnéoud))

[3] Minutes of the CIADT meeting of 18 December 2003.

- The second tunnel involves maximising the positive impacts of the construction sites on the local area
- The third and largest tunnel refers to the use of the Lyon–Turin project as a strategic lever for territorial development on a larger scale

Clearly, the *Démarche Grand Chantier* does not encompass the entire project as set out above but only the first and the second tunnels. The central hub, the construction of the infrastructure, is the responsibility of the French government and the project leaders. The *Démarche Grand Chantier* monitors the progress of this element, which is essential for it to be able to carry out its own actions, but it does not intervene.

The outer tunnel, which includes the potential opportunities for capitalising on the project on a larger scale, for example, to boost development of the entire *sillon alpin*[4], is at present no more than a concept. This could perhaps become a future 'transalpine plan', cousin of the 'cross-channel plan', which covers an entire region in northern France around the Channel Tunnel (between Ashford, England and Calais, France).

13.3 What Exactly is the Demarche Grand Chantier?

The *Démarche Grand Chantier* is a collection of strategic thinking, tools and actions aimed at:

- Preparing the groundwork for setting up of new construction sites in the area
- Supporting the construction work as it is carried out
- Making the most of opportunities arising from the construction project to develop and add value to the local area for the benefit of its population, especially through local development initiatives
- Anticipating, in the longer term, the post-construction environment

Out of these differing but complementary objectives clearly emerges what is effectively the underlying theme of the *Démarche*: identifying a win/win strategy.

With regard to the construction sites, the developers of the new Lyon–Turin rail link project—the French State and the project leaders—must clearly ensure that the correct conditions are in place to guarantee the operational success of the project: a qualified pool of labour, the satisfactory organisation of housing for the workers and the correct management of land ownership issues.

From the point of view of the affected territories, the institutional stakeholders and the local population itself can legitimately expect that the negative impacts of the construction project should be neutralised or at least reduced and that conversely, the opportunities which may be created by such construction works for improv-

[4] The low-lying area in Eastern France between Geneva and Valence, including the urban areas of Annecy, Chambéry and Grenoble.

ing the quality and the development of the local area should be seized, organised and supported.

The *Démarche Grand Chantier* seeks to create the conditions for bringing together these interests and expectations and for building cooperation among the different stakeholders. It is a question of developing together a set of measures which are all in the common interest.

The first role of the *Démarche* is to try to evaluate in advance the technical needs of the construction sites, for example:

- The need for a qualified labour force available at the right time and in the right place
- The need for housing and accommodation of site personnel and their families
- The future principal contractors’ need to be able to rely on a network of local, qualified and high-performance subcontracting companies and service providers

This work of anticipating and responding to the needs of the construction sites should be ongoing and run in parallel with the construction work throughout the entire duration of the project. It should also be continued through the project completion phase and well into the post-construction phase.

A specific feature of the *Démarche Grand Chantier* is its overarching principal that as the necessary measures are put in place to meet the requirements of the construction sites, these should not have any detrimental impacts on the underlying socioeconomic conditions of the local area.

For example, the need to recruit labour should be addressed without draining the local labour market and, more importantly, without depriving local companies of their existing personnel, particularly in the construction and public works sector. In the same way, the supply of housing for construction site personnel should be ensured without impairing the ability of the local population to meet its housing needs.

With regard to environmental issues, recommendations concerning the environmental management of the construction sites may be made to the companies working on the sites, alongside the actions of the project leaders in this area, to tightly limit any negative environmental impacts.

In the area of employment, one objective is to mobilise, as far as possible, the local and regional labour markets, notably by redirecting job seekers struggling to find work in the most saturated sectors in terms of available labour towards those sectors with a labour shortage. In particular, this process will be focused on helping those sectors suffering a chronic labour shortage: the construction and public works sector and the hospitality (hotel and restaurant) sector. The aim is to address the ongoing difficulties experienced by these sectors as early as possible, without waiting to be confronted directly with the specific employment demands of the Lyon–Turin project.

In the same way, the actions to be undertaken in the area of professional training should lead to a sustainable improvement in the skill level of the local labour force. The companies themselves, essentially in the construction and public works sector, are invited to take part in an open initiative of pre-qualification and monitoring of professional performance, both individually and collectively, the benefits of which should continue well beyond participation in the Lyon–Turin construction sites.

Above and beyond these summary examples, it is without doubt in the context of 'territorial projects', actions emerging from the initiative of local authorities and stakeholders and supported by the major institutions in the *Démarche Grand Chantier*, that the opportunities created by the implementation of the Lyon–Turin rail link will be most effectively exploited.

These projects should ideally be aligned with existing mechanisms for setting up territorial projects, established notably by the State (via the CPER (*Contrat de plan Etat-Région*—a planning agreement between the national and regional authorities)), the Departmental General Councils and the Rhône–Alps region. The aim is not to create a new category of instruments which are superimposed on the existing ones, but to start from the current mechanisms and processes and enhance them to reflect the needs and opportunities specific to the Lyon–Turin project, as identified by the *Démarche Grand Chantier*.

13.4 Organisation and Financing of the Démarche Grand Chantier

The Regional Steering Committee

The Regional Steering Committee comprises the four institutional partners—the French State, the Rhône–Alps region and the General Councils of Savoie and Isère—as well as the project leaders, Lyon Turin Ferroviaire (LTF) and Réseau Ferré de France (RFF). The committee sets the overall direction of the *Démarche*. It also acts as a coordinator for the financing of operational aspects of the *Démarche* via a labelling mechanism.

The Consultation Committees

Two departmental committees have been set up, one in Savoie, the other in Isère, comprising representatives of the local authorities (in particular, the major *intercommunalités*—consortia of local councils) and socioprofessional stakeholders and representatives of the local consultation committees, which provides a more accurate view of the situation from the grass-roots level. A further option being considered is the formation of transversal, theme-based commissions at the department level.

Technical Bodies

The Coordination unit, which meets periodically, comprises the technical representatives of the four institutional partners and the two project leaders. The unit has

established theme-based working groups (on topics such as employment training and accommodation) which seek contributions from relevant experts and other key personnel from both within and outside the partner institutions.

The Grand Chantier project team comprises a permanent core of technical staff, at present consisting of a project manager appointed by the French government and a project manager appointed by the Savoie General Council.

Financing the Démarche Grand Chantier

The coordination, technical expertise and communication tasks carried out by the Grand Chantier project team and the Coordination unit have been financed up to now by a grant from the French government and by an equal contribution from the Savoie General Council. It is intended that the Rhône–Alps Regional Council and the Isère General Council also participate in future financing rounds of the project. The project leaders may also become involved.

The central activities of the *Démarche* are generally carried out in the form of specific projects and cofinanced by way of grants, either from regular funds or from specific ear-marked funds within the budgets of the institutional partners. To this cofunding is added the share of self-financing by the project architects and organisers.

The labelling mechanism operated by the Regional Steering Committee is intended to direct and prioritise this funding within the partners’ budgets, to ensure that the essential, priority actions agreed as part of the *Démarche Grand Chantier* are achieved.

Within the Rhône–Alpes CPER 2007–2013, the French government, the Rhône–Alpes region and the two General Councils of Savoie and Isère signed a ‘territorial implementation agreement’. This document set out an advance programme of actions to be completed during the period as well as an evaluation of the overall funding requirements, estimated at around 25 million €. This funding is provided by the signatories of the territorial agreement and is added to the share of self-financing required from the beneficiaries of the CPER funding (project organisers). The negotiations of the next round of CPERs 2015–2020, currently underway, provide the opportunity to update the agreement, to take into account the different activities and public consultation rounds carried out in recent years.

European funds (essentially the European Social Fund (ESF) and the European Regional Development Fund (ERDF)) may also be utilised via the different channels available. One example is the funding received through the ‘Poly 5’ project, part of the Alpine Space programme 2007–2013, cofinanced by the ERDF, which sought to optimise local development around the major transport corridor linking Barcelona–Lyon–Milan–Budapest.

13.5 Areas of Activity

Employment and Training

The question of employment and training is one of the priorities of the Lyon–Turin *Démarche Grand Chantier*, in particular:

- Anticipating labour requirements as the construction work progresses
- Ensuring adequate training of the local workforce
- Adapting the qualifications of workers as the construction work advances
- Retraining the local workforce for the post-construction environment

Clearly, the personnel requirements of the Lyon–Turin construction sites primarily concern the construction and civil engineering sectors. However, the companies in this sector already face persistent difficulties in recruiting the necessary personnel to keep abreast of ongoing construction work, in all skill levels and trades. The labour requirements for the Lyon–Turin construction sites will, therefore, only exacerbate this already tight situation (Fig. 13.3).

Moreover, two risks in particular could lead to significant instability of the local economy:

- A 'siphoning off' of local skills (in particular, in terms of qualified labour) by the Lyon–Turin construction contractors to the detriment of the local economy during and after the construction work
- A significant increase in black market work

It is clear that the local and regional labour markets in the sectors primarily concerned by construction of the Lyon–Turin rail link cannot meet the direct and indirect labour requirements that this project is expected to generate. It is, therefore, essential to take the necessary corrective action in advance to adapt the labour market to these expected recruitment demands. The *Démarche Grand Chantier* aims to ensure that all recruiters' requirements can be satisfied. The tools to do this involve the Public Employment Service and/or the private sector through temporary work agencies.

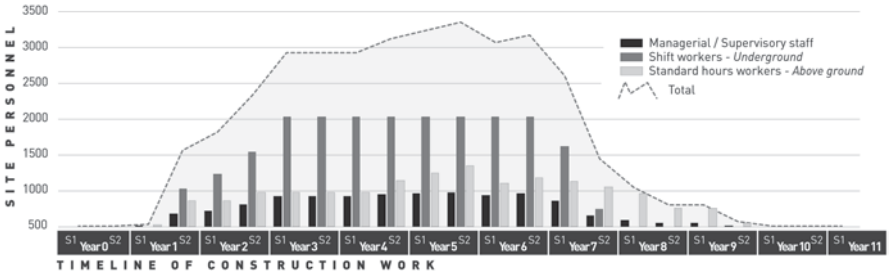

Fig. 13.3 Anticipated labour requirements of the Lyon–Turin rail link construction sites in the Maurienne valley. (Source: Grand Chantier project team (Bernard Barnéoud))

Accommodation and Housing

The Lyon–Turin Grand Chantier project team has analysed and made recommendations concerning the accommodation of the construction site personnel. The studies carried out, which were also based on experience of previous large-scale construction projects in the region, enable forecasts to be made of the amount and type of accommodation needed. A ‘win-win’ logic is favoured consistent with the underlying approach of the *Démarche*.

Land Use

A land use study has provided an overview of the current state of the land and property markets in Savoie and in particular in the districts concerned by the future Lyon–Turin rail link, demonstrating the direct and indirect impacts of the project on land use.

The largest impact is on agricultural land. In addition to the land which will be directly removed from this activity, the indirect impacts on farming conditions could be considerable. Among the measures to be put in place, land consolidation constitutes the first appropriate tool and appears indispensable.

Support for the Local Economy

The preparatory studies made to capitalise on previous ‘*Grand Chantier*’ procedures (the Channel Tunnel, nuclear power stations) have identified support for the local economy as a pivotal issue for the Lyon–Turin *Démarche Grand Chantier* and as a major success factor.

Two aspects can be clearly identified:

- Supporting the existing economy: The measures to be taken are aimed at drawing out the real added value of the construction work for the benefit of the local economy. They will also facilitate the achievement of the construction work itself, by improving the dynamism and reactiveness of local firms to respond to the needs of the construction project
- Accommodating new companies engaged in activities related to the Lyon–Turin construction work

Environment

Consideration of the environmental impacts of the Lyon–Turin project is primarily the responsibility of the project leaders, within the numerous laws and regulations applicable. Moreover, the public enquiry into the Lyon–Turin rail link project, car-

ried out by the French government, was based on a comprehensive assessment of the project in which environmental issues constituted an important element. This provided the ideal opportunity to put the anticipated environmental impacts under the spotlight and to debate the appropriate measures to be adopted.

The *Démarche Grand Chantier*, therefore, has no official responsibility in this area. However, that does not exclude it from having a secondary, but original, role to play with regard to environmental issues. In line with its underlying objectives, the *Démarche* can add value in the areas of forward planning, promoting the interests of the local territory and in qualitative innovation.

The *Démarche Grand Chantier* could also play a role as a facilitator in a variety of ways, including the commissioning of external expert studies or as the catalyst for innovation aimed at improving the environmental credentials of the construction sites and the project itself. Thus, throughout the project life, as well as on a case-case basis, the *Démarche Grand Chantier* should be capable of providing assistance and solutions, via this external expertise, to support and assist local stakeholders in their environmental projects, independent of the project leaders' legal responsibilities.

Moreover, in some ways, the *Démarche Grand Chantier* could be a driver for innovation to enhance the environmental quality of the entire Lyon–Turin project. Indeed, the arguments put forward to justify the Lyon–Turin project are in large part founded on the environmental assessment of rail transport compared with road transport (energy efficiency, carbon footprint, safety, etc.). Nevertheless, the legal noise limits in force along transport routes consider the noise at its source, but do not take into account the diverse range of situations that exist in the Alpine regions (the specific nature of built-up areas adjacent to the route or further away, human activities, including tourism, natural areas). The way in which rail noise is perceived and the level of nuisance it causes are yet to be studied.

The *Démarche Grand Chantier* could be in a position to carry out experimental work on the measurement of the acoustic disturbance some distance from the infrastructure in different test sites, for example, an enclosed valley site, a mountain ledge and an urban site. The results of such a study and their comparison with the data used by the project leaders in applying the noise regulations in force could provide the basis for consideration of possible complementary provisions and the mechanisms for financing them.

13.6 Conclusion

In summary, it is important to highlight the notion of *Démarche* or 'approach' and exactly what this encompasses. The *Démarche Grand Chantier* is not a codified process, but rather a framework within which an operational partnership can be defined between the local authorities, socioprofessional stakeholders, the local population and the infrastructure project leaders. This partnership approach enables the different issues at stake to be identified, the responsibilities and interests in each case to be clearly established and a group dynamic to be created such that 'win-win' solutions can be developed, which address the needs and interests of both the construction project and the territory.

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Chapter 14
The "Territorialization" of Mega Transport Infrastructure Projects—The Results Achieved by the Turin–Lyon Technical Observatory

Giannicola Marengo, Susanne Nilsson and Paolo Picco

14.1 Introduction

This chapter addresses governance-related aspects of the Turin–Lyon new railway link project in Italy, from early design hypotheses to the facts that led to the governmental Technical Observatory establishment and to the final preliminary project.

This historical excursus can be divided into three specific periods:

Before the Observatory (1992–2005): from the decision to realize the Lyon–Turin new railway link to the establishment of the Lyon–Turin Ferroviaire (LTF), the actual infrastructure contractors
After the Observatory (2006–2011): from the establishment by the Italian government and local authorities of the Turin–Lyon Technical Observatory to the new infrastructure layout
The Lyon–Turin layout: the preliminary project resulting from the observatory negotiating efforts with its elements of "territorialization"

Thus, before presenting these periods, we mention that the Lyon–Turin railway link, which crosses the western Alpine arch between France and Italy, consists of three main sections:

The *French section* stretching from Montmélian to St.-Jean-de-Maurienne, both part of the Savoie department in the Rhône–Alpes region
The *Italian section* stretching from the municipality of Bussoleno to the metropolitan area of the city of Turin, both belonging to the Province of Turin in the Piedmont region

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The *cross-border or international section* stretching from St.-Jean-de-Maurienne to Bussoleno. The sections stemming from the national border are then often defined as the "French side" or "Italian side," depending on the national competence they fall under

14.2 Before the Observatory

To describe the early years, it seems useful to highlight the relevant steps as follows:

1992—in Paris, on 9 and 10 November, an Italian–French meeting takes place, and the political decision to realize the Lyon–Turin link is taken. It is also decided to establish a bilateral negotiating body, the Comité de Pilotage or Steering Committee, which, since January 1993, is in charge of setting the agenda for the infrastructure realization, using results achieved by studies commissioned by the railway owners.
1994—thanks to the boosting impulse given by the Promoting Committee Transpadana[1], Italian and French railway owners constitute in September a so-called European Economic Interest Grouping (EEIG), named Alpetunnel, in charge of realizing the executive project of the Lyon–Turin link.
1996—on 21 June, the Promoting Committee Transpadana organizes in Turin, together with the EEIG Alpetunnel, a conference titled "The Lyon–Turin New Railway Link Within the Local, National and European Framework" during which, for the first time, technical experts and local authorities confront each other. The committee proposes the establishment of a working group acting as a permanent negotiating table between the Alpetunnel technical instances and local communities' needs (the committee is chaired by the region of Piedmont).
During the meeting, the establishment of the French–Italian Intergovernmental Commission is announced, although it becomes operative only in 1997.
2001—the company LTF is founded on 3 October with a 50:50 partnership between Réseau Ferré de France (RFF) and Rete Ferroviaria Italiana (RFI), the two national railway owners.

In those years, the Alpetunnel Project benefited from various contributions, in terms of ideas and proposed layouts, from different stakeholders interested in the transalpine transport development. This happened until 2004, when the definitive project made by LTF and RFI was published: the so-called *Dora Left Bank Project,* referring to a layout that concerns the left bank of the Dora Riparia River, which cuts through the Susa Valley (Fig. 14.1).

[1] The Promoting Committee Transpadana was established in 1990 at the initiative of the Piedmont Industrial Federation, Piedmont Region, Municipality of Turin and Tecnocity Association with the aim of promoting the development of the west–east rail route Lyon–Turin–Milan/Genoa–Venice–Trieste–Ljubljana.

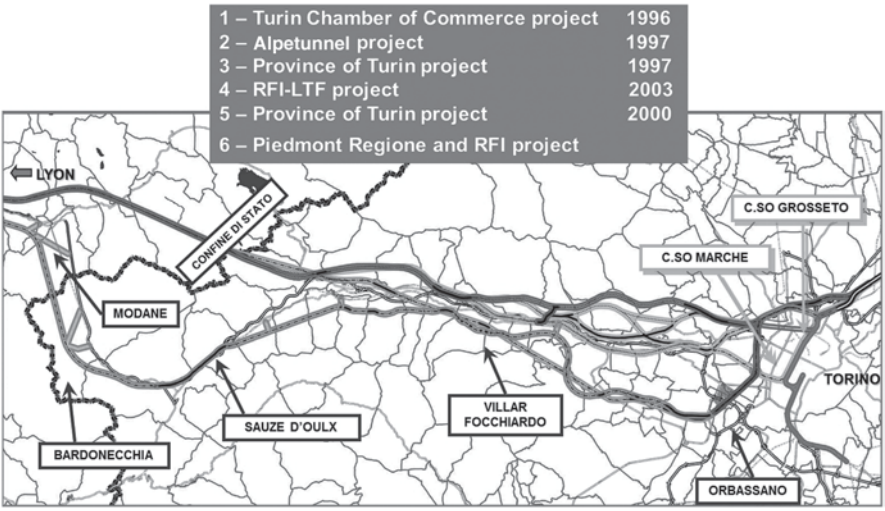

Fig. 14.1 2005 plan for the Italian section of the Lyon–Turin new railway link showing, through *different shades,* the previously proposed layouts. *RFI* Rete Ferroviaria Italiana, *LTF* Lyon–Turin Ferroviaire. (Source: Province of Turin's own elaboration)

It is interesting to synthesize some of the most relevant contributions received in that period as they show the various interests expressed by stakeholders:

Turin Chamber of Commerce proposal: quadruplicating the historical existing line with long dugout sections in order to reduce both related works and noise emission

Province of Turin proposal: focused on the so-called *Dora Right Bank Project,* which would integrate the freight hub in Orbassano (just outside the Turin metropolitan area) in order to provide the city of Turin with a competitive logistic node capable of becoming an intermodal terminal and not only a "drive-through" station

Piedmont region proposal: aimed at avoiding the risk of cutting out the city of Turin from the main traffic routes through the realization of an external bypass dedicated to freight traffic

RFI proposal: to integrate, through an underground link, the freight hub in Orbassano in compliance with the Province of Turin and other local authorities requests

2005—thanks to the joint initiative of the Piedmont region, the Province of Turin and local authorities, the link between the Orbassano freight hub is included in an Inter-ministry Committee for the Economic Programming (CIPE) deliberation in August, but its financial cost is charged on the region and the other requesting local authorities.

14.3 After the Observatory (2006–2011)

As a response to the harsh events that occurred in Venaus (i.e., clashes between police and demonstrators of the so-called NO-TAV, a movement against the realization of the high-speed railway) and upon request of the Susa Valley local authorities, the Turin–Lyon Observatory was established on 12 December 2006 and chaired by architect Mario Virano, who was soon after nominated as governmental commissioner. The observatory acts as the technical tool to deepen and elaborate issues promoted by the Chigi Palace Institutional Table[2] composed by all authorities interested in the infrastructure and, therefore, also by the Susa Valley municipalities.

In the first period of the observatory activity, neither layouts nor technical projects were discussed, but it focussed on four main topics agreed upon with local mayors, even of those municipalities opposing the infrastructure:

The historical existing line potentialities
The traffic flow analysis of the entire Alpine arch
The "Turin node" with all its logistic and connectivity implications
Alternative layouts to the original project, accompanied by technical elements to be provided to the experts in charge of preparing the preliminary projects and the environmental impacts studies, who had to compare all alternatives

This period lasted almost a year and a half, during which all sensitive topics were discussed in over 70 meetings and almost 300 auditions with the contributions of international experts. The entire activity is documented in the so-called Quaderni dell'Osservatorio, a sort of diary keeping track of decisions, discussions and everything that occurred within the observatory when the technical work was accompanied by constant confrontations and discussions with local mayors, municipal councils and public opinion.

One of the first results is the "Pracatinat Agreement," reached on 28 June 2008 and shared by all observatory components, which defines a common road map and marks the beginning of the assessment phase, at preliminary level, of alternative layouts and projects.

On 29 July of the same year, the Chigi Palace Institutional Table, during a meeting convoked in Rome upon governmental initiative, approved the Pracatinat Agreement and entitled the observatory to coordinate, in terms of governance, the works related to the preliminary project of the Italian section of the New Lyon–Turin Line (NLTL).

The definitive project, which was the trigger for the Venaus clashes mainly because it led off with probing activities and, therefore, conveyed the idea that works were really starting, was abandoned and a new project phase began under the lead of the observatory and through a constant confrontation with local authorities.

Under the observatory coordination, in fact, the preliminary project for the entire Italian section was issued, involving areas from Settimo Torinese (located in the

[2] This political table takes its name from the Chigi Palace, site of the Italian government.

eastern outskirts of Turin) to the national border. Although often delegitimized, this result is still considered one of the most important examples of participated infrastructure planning.

14.4 The Lyon–Turin Layout (Preliminary Project)

The preliminary project (Fig. 14.2) contains both the surface and the underground sections as well as the alternative layouts, which were considered, but discarded with motivations.

The project takes into account a set of constraints:

The connection with the French base tunnel
Porta Susa International Station (one of the two Turin main stations and specifically designed for high-speed trains)
The presence of technical and security system facilities in already compromised areas
The logistic platform in Orbassano
The "Corso Marche" integrated axis, i.e., one of the most important routes crossing the Turin metropolitan area
The connection to the Turin–Milan high-speed/high-capacity (HS/HC) line in Settimo Torinese

Figure 14.2 allows highlighting some of the results of the territorial governance process, which entailed the involvement of areas affected by the infrastructure as well as the project's continuous fine-tuning to pursue a shared layout representing the best available solution.

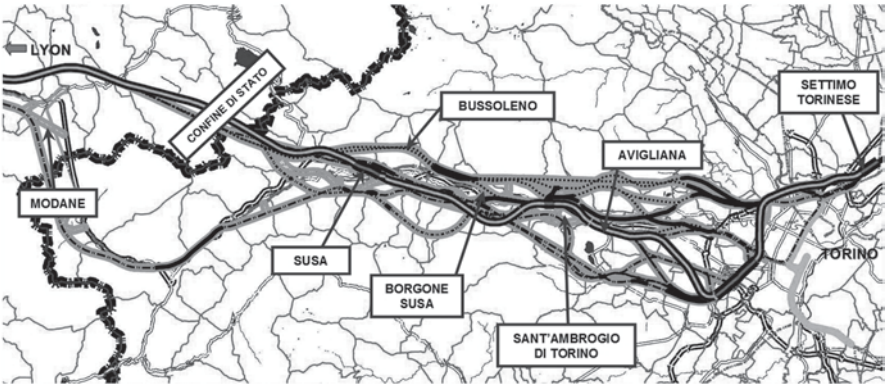

Fig. 14.2 Plan of the Italian section *(double line)* with indication of previously presented proposals. (Source: Province of Turin's own elaboration)

The Project Data

The overall Italian section, which represents less than 30% of the entire Lyon–Turin link, is 81.1 km long.

The *international section—Italian side*—is 34.4 km long (of which 31.9 km are underground and 3.5 km on the surface), beginning at the national border between Italy and France (the Italian section of the base tunnel is 12.3 km long). The tunnel entrance is located in the territory of the municipality of Susa where an international station is also planned as counterpart of the French station planned in St.-Jean-de-Maurienne; the new line continues then, after crossing the valley, in a natural tunnel (the so-called Orsiera Tunnel) up to Chiusa di San Michele where it intersects a security post.

The *Italian section* is 45.7 km long (of which 38.7 km are underground and 7 km on the surface), starts in the tunnel located within the municipality of Sant'Ambrogio di Torino and continues below the historical existing line in the territories of Avigliana and Buttigliera Alta, where it intersects the historical line. It then continues, in both natural and artificial tunnels, crossing the territories of Rosta, Rivoli and Rivalta to reach the freight hub in Orbassano. Here the new line connects again with the historical line through the existing dugout in Grugliasco and at the so-called Pronda fork, it diverges: On one side, the passenger-dedicated line continues entering the city of Turin and reaching Porta Susa International Station and, on the other side, connecting to the Turin–Milan HS/HC link through the so-called freight bypass.

This project has received a lot of criticism, especially because of the presumed high costs of the new proposal with respect to the *Dora Left Bank Project* issued in 2003: The two projects, however, are profoundly different.

While the former project considered the Susa Valley and the Province of Turin area as a "transit pipeline" with little connection to the territory and even less positive spillover, the 2011 project takes into account territorial instances, impacts of minimization, the Orbassano hub connection and also the functional realization of Susa International Station. These actions, able to produce infrastructural and economic advantages, have been considered as an essential prerequisite by the authorities representing the economic and social local systems. In particular, the new project takes into account the connection with the freight hub in Orbassano, which is strongly supported by the Piedmont region and the local authorities and shared with the government. However, this solution has been harshly thwarted by those who preferred to discard the Orbassano hub prefiguring de facto a Lyon–Milan direct link where the Province of Turin area played a "drive through" minor role.

Moreover, with respect to 2003, the 2011 project has entailed the prolongation of the railway, especially in underground sections with a considerable reduction of surface sections (from 6 to 3 km).

Not considering the above-mentioned prerequisites wanted by local authorities (such as Susa International Station, Orbassano hub, etc.), the costs of the 2011 preliminary project are only around 17% higher than those of the 2003 *Dora Left Bank Project*.

The Low-Cost Project: The First Phase Description and Costs

Retrieving all necessary funds to implement the entire infrastructure, as it was planned at the beginning, seemed unrealistic. For the cross-border section, the intergovernmental commission, in accordance with the EU, considered a better solution to operate through functional phases: This is the reason why LTF subdivided the project into smaller parcels, designed to maximize the advantages connected with the infrastructure while reducing initial investments. This decision has also been shared by the CIPE.

On 20 December 2011 in Paris, the intergovernmental commission approved the new bilateral agreement formalizing the decision to realize the Lyon–Turin new railway link by functional phases. Among other aspects, the agreement defines, within the general international section, the more specific "cross-border section" stretching from St.-Jean-de-Maurienne in France to Susa–Bussoleno in Italy including:

The base tunnel
The international stations in Susa and St.-Jean-de-Maurienne
The connectivity to the existing lines

Through the realization of the cross-border section, many results can be achieved:

The maximum share will be considerably reduced: from the actual 33 to 12.5%. Trains will have higher capacity (from 1050 to 2050 tons), length (up to 750 m) and lower energetic costs, thanks to the reduction of traction linked to supporting locomotives needed to cross the Alps, leading to an overall 42% cost reduction. With respect to passenger transport, trains will be faster (from the actual 80 km/h up to 220 km/h), allowing the railway to be competitive with airways especially for destinations such as Milan–Paris and Milan–Barcelona

On the same date (20 December 2011), a competition for the Susa International Station Project was published in the Official Journal of the European Union (OJEU). Thus, Susa Station is conceived as a "bridge station" to be connected to the other station planned in St.-Jean-de-Maurienne and destined to become a node capable of significant modal shift and an instrument to enhance the valley's tourism outlook.

A dedicated commission examined proposals submitted by over 170 architecture and engineering offices grouped in 49 teams. In each of these groups, various professions were represented: from urban and landscape planners to geotechnical, systems and structural engineers as well as transportation and mobility experts. Many of the most renowned names at international level participated together with start-ups. Five groups were selected (Kuma & Associates Europe, Foster & Partners, EMBT, GMP, and Dietmar Feichtinger Architectesc) to present their preliminary projects in May 2012.

The awarded project was the one presented by Kengo Kuma & Associates with AIA Engineering and LTA J&A (Figs. 14.3 and 14.4).

Fig. 14.3 Volumetric rendering of Susa International Station located at the intersection of the new and the historical line. (Source: Kengo Kuma & Associates)

The Susa International Station

The new station will be built on compromised land. Part of this land will be returned to green area.

In particular, the rail transport system will provide the occasion to re-establish a relationship with the city of Susa, its history and facilities. It has been integrated into new patterns merging international, regional and local transport with the following breakdown:

Up to 10 international passengers trains
Up to 8 regional fast trains from Turin to Lyon
Up to 8 "mountain trains" during weekends (2 round trips from Italy and 2 round trips from France)
Forty regional trains on the historical existing line Turin–Susa

The French Section

The French government started the negotiating phase[3] with local authorities in January 2012 and has confirmed the intention to pursue all improvements needed

[3] This phase is called "Débat Public" and is a compulsory step, regulated by national law, activated whenever a local territory is affected by the construction of a major public work.

Fig. 14.4 Susa International Station Project: roof and covering details. (Source: Kengo Kuma & Associates)

to make the railway operative by 2023, i.e., the scheduled date to finish the base tunnel. Priorities focus on the Lyon–Chambery line adjustment and the construction of the Belledonne and Chartreuse tunnels towards St.-Jean-de-Maurienne, as dedicated transit for freight traffic.

The Italian Section

Similar to the French section, in Italy too the "step-by-step" approach is being pursued in order to reach, by 2030, important results for the line functionality, and in particular:

Activating, through the Orbassano hub, new modalities for freight transport and modal shift: The transport capacity would highly increase, and it would be possible, by unloading the historical existing line, to fully implement the Metropolitan Transport System enhancing the local public transport while reducing bottlenecks and air pollution.

Building the tunnel from the Pronda fork to Settimo Torinese as external "freight bypass" will considerably reduce the city of Turin freight traffic load.

The Construction Sites' "Territorialization"

The infrastructural project has to be seen as a territory project and this means:

Anticipating works to reduce environmental impacts
Reducing working areas perimeters
Avoiding base camps for workers
Moving materials related to construction sites only by rail
Developing closed and protected environments to work in
Enhancing positive *spillover* effects on economy and labour market

The region of Piedmont, with the contribution of the Province of Turin and the Turin–Lyon Governmental Commissioner, issued the regional law no. 4/2011 "Promotion of Interventions in Favour of Territories Affected by Major Infrastructure. Construction Sites—Development—Territory," the first example of a regulation of this kind in Italy. The aim of the law is to develop supporting measures for major public works, capitalizing on the French experience of the *Demarche Grand Chantier* while adapting it to the regional context.

The regional law aims at reducing the negative impacts and maximizing positive *spillover* effects on affected territories, not only during the building phase but also before and after it, through the harmonization of mitigation, compensation and supporting measures with particular attention to shared and negotiated instruments. Actions should support local economies, employment and vocational training systems, add value to the public/private building heritage and to material extracted from the construction sites.

The observatory, Piedmont region, Province of Turin and the majority of the local authorities are meeting weekly to work on these actions, cooperating with the railway representatives (RFI, LTF) to fine-tune the project, reduce impacts, and maximize economic and social advantages through a constant and continuous dialogue—in other words, to realize the best possible infrastructure.

Giannicola Marengo graduated in Engineering in 1982, and after a couple of years, he started working in AEM Torino, the metropolitan energy agency of Turin. Since 1998, he is executive manager within the Province of Turin with responsibilities on the design and construction of new road infrastructure and the management of the public transport network. He also participated to the preparatory work for the Turin–Lyon new railway link as member of the Observatory to technically assist the infrastructure construction.

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Paolo Picco graduated in Architecture at Polytechnic University of Turin in 2000. He collaborates with the Province of Turin since 2002 as an expert in the branch of transport planning. He has worked on local public transport, sustainable mobility and has followed, since its foundation, the work of the technical Observatory for the new railway line between Turin and Lyon. He has also been involved in a number of European projects for different programmes (Interreg, Alcotra, Alpine Space).

Chapter 15
Integrating Mega Transport Infrastructures with the Complex Territories of the Veneto Region—A Weighted Programmatic Approach

Andrea Ballarin, Marilanda Bianchini, Federica Di Piazza and Raffaella Lioce

15.1 Introduction

The Veneto Region in Italy has always been considered a binding crossroad from and to Eastern Europe, moving goods and people along this direction, and along the north–south axis, in particular toward central Europe and toward the gateway represented by the Adriatic Sea and the Mediterranean countries. This inherent characteristic is recognized by the fact that three out of four Trans-European Network for Transport (TEN-T) core network corridors passing through Italy cross the Veneto Region (i.e. Baltic–Adriatic, Mediterranean and Scandinavian–Mediterranean). In particular, two of them cross the Province of Venice, while one of them, the so-called Mediterranean Corridor, includes a portion of the Major Transport Infrastructure (MTI) TEN-T Priority Project 6 (TEN-TEA 2005) investigated by the Veneto Region Administration within the framework of the Poly5 project.

The Veneto area and the Province of Venice in particular appear as a complex territory that has to deal with the challenge to accommodate new infrastructures. One of the first issues to be tackled is represented by the housing density in the area:

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with more than 350 inhabitants/km^2, it is 1.5 times the national average and more than 6 times the average of the relevant Alpine area (Veneto Region 2011). The high housing density in the province has certainly contributed to the development of a diffused urbanization, which began in a distant past proved by the presence of seven different archaeological sites and numerous historical villas, gardens and centuries-old castles in the Venetian area (Archeoveneto 2010).

Furthermore, the territorial complexity is increased by numerous areas belonging to the Nature 2000 network, which is constituted by more than 40 sites of community importance (SCI) and special protection zones (ZPS), all together representing more than 25 % of the entire area (MATTM 2013).

Finally, discussing transport and mobility, the high touristic flows that periodically move toward the art cities and the seashores of Veneto (in 2012, more than 15 million arrivals were registered, of which 8 million only in Venice) cannot be left out of consideration as they are stimulated also by the complexity of the territory as described above (Veneto Region 2011). Such a complexity has hence contributed to hold back the decision-making process that should have led to the identification of a definitive blueprint for the new high-speed/high-capacity (HS/HC) rail line Venice–Trieste, thus leaving on the ground different alternative solutions.

Starting from the consideration that it would make no sense to discuss the validity of one of the proposed track layouts or a quantitative comparison between the potential alternatives that are not backed by a definitive plan on which it will be possible to make detailed evaluations and calculations, the Veneto Region Administration has tried a more general programmatic approach.

15.2 The Veneto Region's Role and Specific Aim

Within this context, the Veneto Region, partner of the European Poly5 project, worked mainly on aspects related to the environmental and territorial integration of infrastructures and on the possibility to make local stakeholders interact actively on the definition of spatial strategies to be developed during the realization of Mega Transport Infrastructure Projects (MTIPs). The main topic was therefore identified as the creation of a tool supporting local decision-makers in the choice of a better way to manage the environmental and territorial criticism arising from the infill of new infrastructure in the Veneto Region, focusing in particular on the potential effect regime of the HS/HC line Venice—Trieste affecting specifically the Province of Venice.

Thus, the Veneto Region Administration's main aim, defined in the Poly5 Work Package 5 (WP5), was addressed to the problems related to the involvement of local stakeholders in the decisional process, to the integration of infrastructures within the territory and the environment and to devise the best mitigation measures available to compensate the negative externalities caused by the construction of an MTIP on a specific territory.

Assumption

Assuming that the infrastructure will have to be realized in any case, and it will have to cross territories in the Veneto Region, in particular in the Province of Venice, a tool was devised to support and lead decisions of the public local decision-makers and to allow the most favourable conditions to deliver positive guidelines in order to make the target infrastructure as much integrated as possible within the territory.

Specific Decisional Problem

The aim was therefore to realize a tool able to support and steer requests and instructions of local stakeholders in an efficient form and to seize priorities and constraints in order to obtain a coherent infrastructure, integrated with the territory, the landscape and the environment. Once realized, the tool could thus have a triple function:

- To present to public decision-makers the different options available to manage the environmental and landscape-critical situations generated by the prospective infrastructure, delivering quantifiable and qualitative instructions on the potential intervention strategies
- To allow decision-makers to set priorities with respect to the impacts on the environment and the landscape, providing enough flexibility for further interpretations deriving from shared knowledge of the area and its peculiarities
- To support decision-makers during the evaluation process of effective and sustainable intervention strategies, combining sustainability performance tools with impact mitigation tools

Finally, the tool does not have the aim to evaluate the quality of the planning solutions and/or to compare them, but, on the contrary, it is targeted to support public local decision-makers in adjusting specific operational specifications of the infrastructure in order to enhance its integration within the territory in regard to local priorities.

15.3 Theoretical Background

Planning an infrastructure bears a complex decisional process. Besides the economic benefits that can stem from the implementation of an MTIP, consequences could be countless. Their number might depend on the criteria adopted to define and evaluate them. Therefore, whenever it is possible to predict that realization of an infrastructure might generate unavoidable negative effects, planners and decision-makers should take particular care managing such critical issues by adopting adequate measures, apt to minimize negative impacts. Most importantly, these measures need to be designed while planning the infrastructure. What these measures

are and how to order them in terms of priority and efficiency is a problem which could have different solutions. Anyhow, interpretations should take into account appropriate criteria and release one or more solutions, possibly determined by constraints as objective as possible.

Given the complexity of the issue, solutions offered by the operational research (OR) method were deemed sound to perform a multicriteria analysis (MCA) as it appeared as the most appropriate choice to make explicit the contributions of the different choice options with regard to the diverse criteria or attributions. The selected criteria in the end reflect the tool used to compare the various alternatives with regard to the objectives of decision-makers (Luria and Morara 2002). Furthermore, MCA has been developed since the 1980s especially to support public decision-making processes that had to face complex decisional issues as, for example, in the case of environmental impact assessment (EAI; Rostirolla and Monacciani 2009).

Procedure of Analysis

Once the choice has been made with reference to the analysis procedure to be adopted, the decisional problem shifted to the need to identify the management tools for critical landscape-environmental issues generated by the linear layout of a transport infrastructure and by the connected need to adopt mitigation measures that are effective to tackle problems of compatibility with the territory and hence to identify the most relevant and efficient mitigation measures. Consequently, two considerations were acknowledged: (i) that the effectiveness of the mitigation derives mostly from the capacity of the mitigation itself to respond to the impact generated by the infrastructure and (ii) that the sustainability of the mitigation measure is also given by its degree of technical, economic and social feasibility.

Thus, the evaluation approach adopted has been set with the aim to realize a tool that would aid, following a model, to manage two fundamental operational branches (Fig. 15.1).

The operational branches produce the following matrices:

- *Impacts matrix:* Impact criteria are inserted into the system with reference to the potential target territories, defining characteristics, weights, priorities and the related most effective response (mitigation) indicators.
- *Feasibility matrices:* Identified mitigation options are inserted into the system according to their sustainability and economic/environmental feasibility for the different impacts categories.

Matching impact criteria with different territorial types, it would be possible to realize a tool to support decision-makers in choosing the best adequate intervention/mitigation measure with regard to the real critical issues of the area and in setting priorities among the various aspects of the matter, having an in-depth knowledge of the target territory.

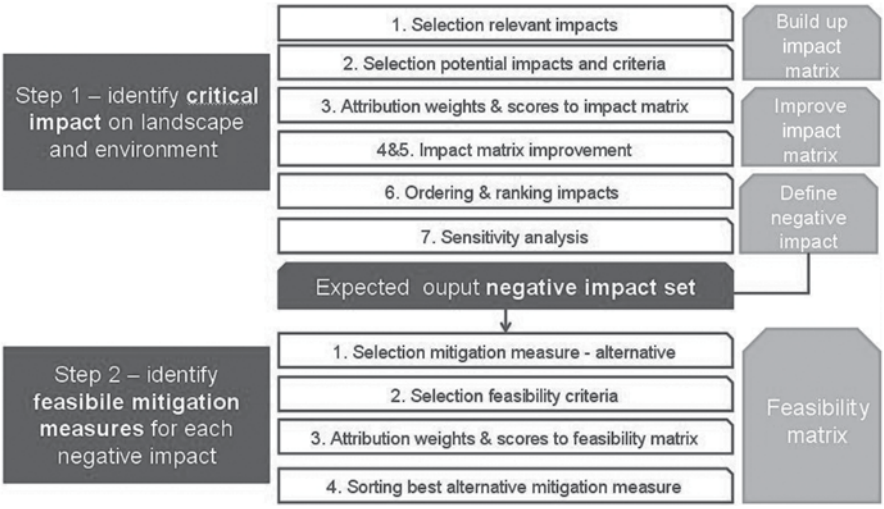

Fig. 15.1 The logical macrostructure of the procedure adopted to realize the tool. (Source: Authors' own elaboration)

Notwithstanding its large scale, any MTIP passes through a specific and relatively small area (e.g. a municipality) and it is expected to generate environmental and/or landscape-negative impacts. Given that such impacts require a response, the tool allows itemizing the problem following the logical-procedural pattern described below:

- Identify the different types of territory affected and the correlated potential impacts.
- Identify the more "vulnerable/fragile" sectors.
- Identify the most adequate mitigation measures.
- Drive the choice among the mitigation measures toward the more feasible, sustainable and coherent with the priority issues.

The Impact Matrix

The impact matrix has been designed starting from a quantifiable and qualitative analysis of the area in the Province of Venice and specifically where the target infrastructure is planned to be realized. It led to the identification of various types of territories that could be mostly affected—with different degrees—by the externalities deriving from the potential realization of the infrastructure, especially when operative at full capacity. Thus, it was deemed worthwhile to build the evaluation model around those case study areas.

A preliminary analysis, conducted on the areas affected by the alternative planning hypothesis, has provided the possibility to divide the target territory into two homogeneous groups (Fig. 15.2):

Fig. 15.2 The classification of identified territorial types. (Source: Authors' own elaboration)

- The *open territory,* including rural and agricultural areas and zones not affected, by urbanization processes, not even marginally
- The *built-up territory,* including areas belonging to the urban consolidated context, to the discontinuity areas, to the peripheral-urban area, where typical elements of the urbanization system are distinguishable

Then, the open territory has been divided into two different macro-landscapes according to the characteristics of anthropological activity:

- The *natural landscape,* including open countryside areas, forests, beaches, rivers, lakes, inaccessible and sterile geological areas
- The *agricultural landscape,* including rural areas, external to the peripheral-urban area, where intensive agricultural settlements have developed due to the segmentation of property

The definition of the built-up territory has been differentiated into four relevant types of macro-landscapes:

- The sparse urbanized or *sprawling* territory, including discontinuous urbanization areas and low density or isolated residential settlements, industrial/economic development areas and wide infrastructural nodes
- The dense urban territory or *consolidated city,* including continuous, dense, urban areas for residential and mixed uses, often characterized by public services and green urban areas
- The *historical centres,* classified using the traditional homogeneous territorial zoning (ZTO) system, in which historical centres are classified with the letter A
- The *old towns,* referring to the archaeological areas that are protected by public institutions

The above-developed list of territories has then been matched with two potential impact macro-categories (Fig. 15.3) defined as follows:

- Macro-category *environment,* meaning a "set of physical (temperature, pressure, etc.) chemical (salt concentration, etc.) and biological conditions where life develops" (MATTM 2010). It includes nonliving elements (e.g. water, air, minerals and energy), living elements (e.g. plants, animals, fungi and bacteria) and the whole context where the interactions operate. The context extends from the inside of an organization to the global system.

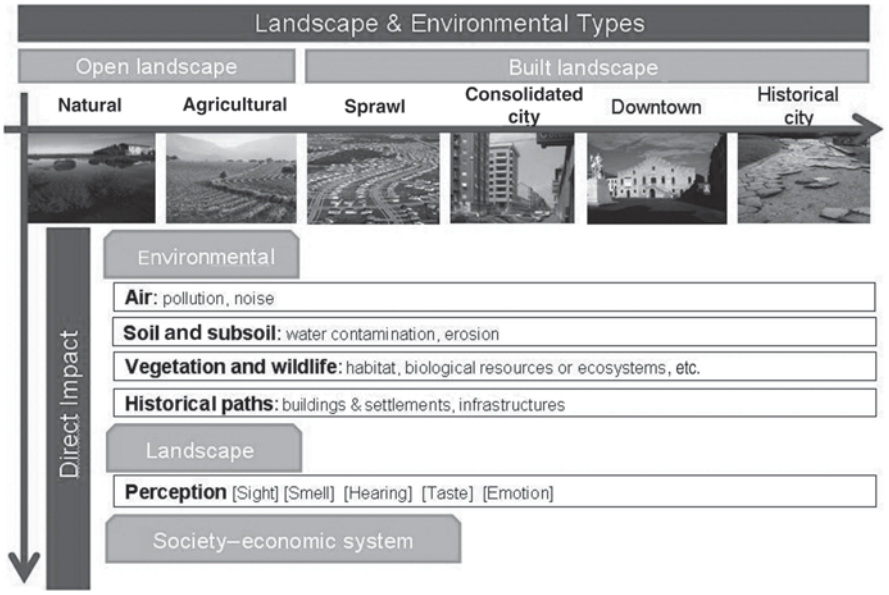

Fig. 15.3 The complete scheme of the impact matrix. (Source: Authors' own elaboration)

- Macro-category *landscape,* meaning a "territory expressive of identities and that has characteristics stemming from the action of natural and human factors and from their interrelations" (MATTM 2010). Thus, the term landscape includes all environmental assets, but considered from a perception and aesthetical viewpoint.

These two impact macro-categories have then been divided into several minor types of impact categories and assigned to a relevant impact indicator, according to literature reviews on landscape and environmental evaluation in different decision-making contexts.

The Bottom-Up Approach

As the construction of MTI is a complex activity with high territorial relevance and high potential impacts, the definition of the evaluation model will necessarily have to be verified through a participative process involving as many as possible relevant stakeholders and technical experts. Bearing this in mind, it was decided to submit the analytical steps—corresponding to different levels of examination of the elaborated matrix—to evaluation workshops (e.g. focus groups) that should graduate the intermediate outputs, contributing to their technical and methodological refinement and confirming their validity and soundness. This testing and tuning phase for the tool contributes to the need of a shared solution of a complex problem. Taking into consideration and highlighting sector interpretations can positively increase

the effectiveness of a tool built by applying a bottom-up approach. Thus, the quality of results achievable through this fine-tuning process will be linked not only to a correct expression of evaluations by participating experts but also to stakeholders' opinions aimed at increasing the quality of the tool itself.

15.4 Future Steps

At a later stage, the impact matrix and its criteria will be further enriched with the identification and assignment of the most appropriate weights to the indicators, as defined in WP5 of the Poly5 project. Therefore, the subsequent steps should further refine the matrix by ordering identified impacts and performing a sensitivity analysis in order to set its final configuration, which will become the starting point for the preparation and realization of the feasibility matrices. Thus, a second operational stage of the analysis will be started on each of the "*n*" macro-categories of impacts identified and eventually selected for the in-depth analysis, consisting of feasibility matrices where the available technical mitigation solutions for a specific territory will be matched with the relevant degree of technical, economic, financial feasibility. The final output of a feasibility matrix will thus consist of an operational indication revealing—according to priorities, constraints, territorial characteristics and fragilities—the best mitigation solution for each impact.

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Marilanda Bianchini graduated in economics from the University of Venice, Ca' Foscari, and then worked in Brussels for EU and Italian organisations. Currently, she is an expert in project and financial management of EU, national and regional funded projects on themes related to transport and infrastructures, logistics, SMEs development and R&D. At present, she is financial manager of EU projects held by Veneto Region and the Port Authority of Venice.

Federica Di Piazza received her PhD from the University of Padua, Department of Mechanical and Innovation Management (2004). Member RICS (2006), she has been researcher at IUAV (2008–2009), where she also taught property appraisal (2002–2012).

Raffaella Lioce is an architect, expert in project management. She is a professor of "projects economic evaluation" at the University of Architecture in Venice. Currently, she works as consultant for private and public bodies in the sectors of environment, infrastructure, cultural heritage and landscape, territorial marketing and local development. Since 2003, she has been dealing with European projects both as a manager and as a technical expert.

Chapter 16
The Baltic–Adriatic Corridor and Its Economic Importance for the Interested Regions

Hans Schuschnig

16.1 The Baltic–Adriatic Axis: A Railway Corridor of the Future Europe

The "Baltic–Adriatic Axis" (BAA) was originally proposed to connect the Baltic and Adriatic Sea basins as the easternmost crossing of the Alps and therefore representing one of the most important north–south railway corridors in Europe. The BAA, as initially conceived, runs through 19 regions in 5 EU member states, touching the following main cities: Gdansk—Warsaw—Katowice—Brno/Zilina—Bratislava/Vienna—Vienna—Graz—Klagenfurt/Villach—Udine Trieste/Venice—Bologna/Ravenna (Fig. 16.1) and connecting more than 40 million inhabitants, linking important intermodal nodes between the Baltic and North Adriatic ports and hooking up Europe to the booming Asian markets.

In the EU Commission's "Proposal for a regulation of the European Parliament and of the Council on Union Guidelines for the development of the trans-European transport network" presented by European Commission Vice-President Siim Kallas in October 2011, the BAA was first included as one of the new European core network corridors. Thus, the BAA was named "Baltic–Adriatic Corridor" and extended through Warsaw—Kaunas—Riga—Tartu—Helsinki ("Rail Baltica") and through the inclusion of Slovenia via Graz—Maribor—Ljubljana and Koper, forming the easternmost north–south connection of the Trans-European Network for Transport (TEN-T) core network with an overall length of more than 3000 km running through ten European member states.

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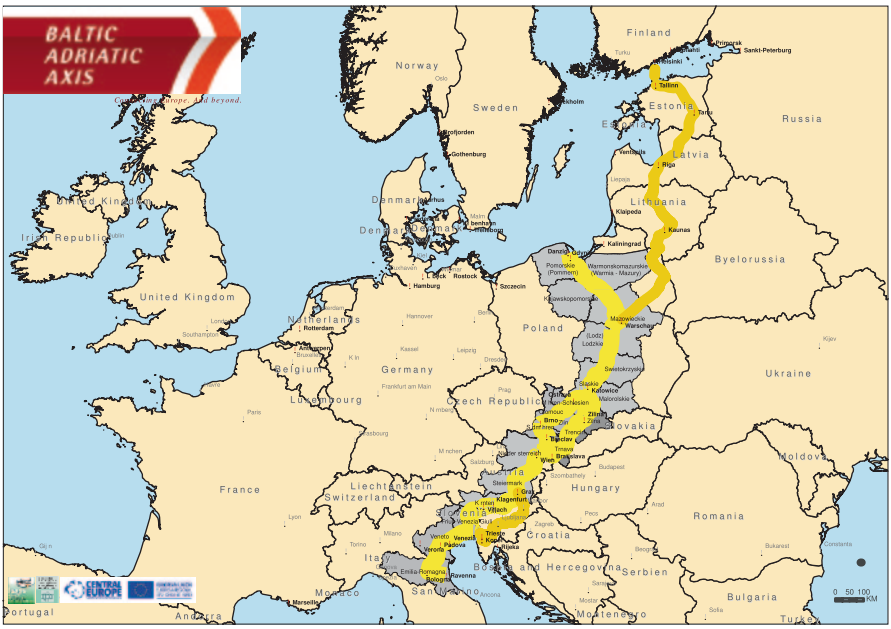


Fig. 16.1 The Baltic–Adriatic Axis. (Source: BATCo)

16.2 International Trade Routes

The ports of Venice, Trieste, Koper and Rijeka, associated with the North Adriatic Ports Association (NAPA) with a total throughput of 101.4 million t of cargo and a total of 1.2 million TEU in 2009, are important players in the European market. Considering also the environmental targets of the agenda "Europe 2020", particularly the reduction of greenhouse gas emissions, "green" transport and logistics will become significantly more important in the coming years. Thus, shipping cargos, coming from Asia via Port Said and reaching the NAPA ports, instead of Rotterdam or Hamburg, will not only gain a time reduction but also a significant reduction in carbon emissions.

A comparison of multimodal equivalence emission classes for cargo shipped via Port Said to main European destinations clearly demonstrates that shipping freight, with destinations to Central and Eastern Europe, via the NAPA ports by the use of an intermodal combination of sea and railway transport is more efficient in terms of both time and energy efficiency. This result is mainly due to the geography of Europe, where ships coming from Asia need to go via the Strait of Gibraltar all the way round the Iberian Peninsula to the Northern European ports.

Expressed in concrete figures, a container originating in Asia and shipped to Krakow (Poland) needs to cover a distance of 7484 km via the Port of Hamburg while the same container would need to cover a distance of only 3364 km when shipped via the NAPA ports. This means a reduction in travel distance of 4120 km or 55 %. Thus, considering the reduction in travel distance, approximately 320 kg of

CO_2 could potentially be saved for one single container with a gross weight of 18 t (TEU) shipped via the NAPA, instead of the Northern European ports.

16.3 Austrian Import/Export via Maritime Ports

In spite of the shorter distance to the Southern ports (e.g. NAPA ports), in Austria the Northern Range ports (e.g. Rotterdam, Hamburg, etc.) are customarily chosen for shipping. In recent years, however, a trend towards the NAPA ports is increasing each year, observing increments for both Austrian imports and exports, resulting in a total of 5.8 million t shipped via the Southern ports in 2010. In particular, from 2009 to 2010, the exports via the Southern ports increased from 27 to 30%, while it decreased from 73 to 70% via the Northern ports. Similarly, imports increased by 12% (from 31 to 43%) via the Southern ports, while it decreased by the same percentage (from 69 to 57%) for freight shipped via the Northern ports (Fig. 16.2).

Therefore, an effective hinterland connection between Austria and the North Adriatic ports becomes more and more important in view of the increased transport volumes shipped via the Southern ports in recent years, considering the forecasted 60% increase in those transport volumes by 2030 (BATCo forecasts, see the following sections).

16.4 Large-Scale Investments in Austrian Railway Infrastructure

Major bottlenecks in the railway infrastructure located in the Austrian territory have become evident along the former BAA with the inclusion in the European Union of ten new member states in 2004. Since then, the Austrian region Carinthia has made significant progress in removing one of those bottlenecks by constructing few new sections and upgrading the “Koralm Railway”. The overall length of 130 km includes the Koralm Tunnel (with a length of approximately 33 km) and a total investment of 5.6 billion €, of which 1.3 billion have already been spent. Completion is foreseen in the early 2020s. The added economic value of the Koralm Railway is estimated to be approximately 210 million € per year.

Another major infrastructure project is the Semmering Base Tunnel, which will connect the Austrian regions Styria and Lower Austria with a length of 27.3 km. Construction works started in October 2012 for an investment of 3.1 billion € and they are expected to be completed in the early 2020s.

The removal of significant bottlenecks in Austria would allow a better connection between the regions and would lead to a significant reduction in travel time for passenger and freight transport with a significant increase of competitiveness for the whole railway system. As an example, it is foreseen that the travel time between Warsaw and Klagenfurt will be reduced to 9 h from the current 12 h (with a saving of 3 h).

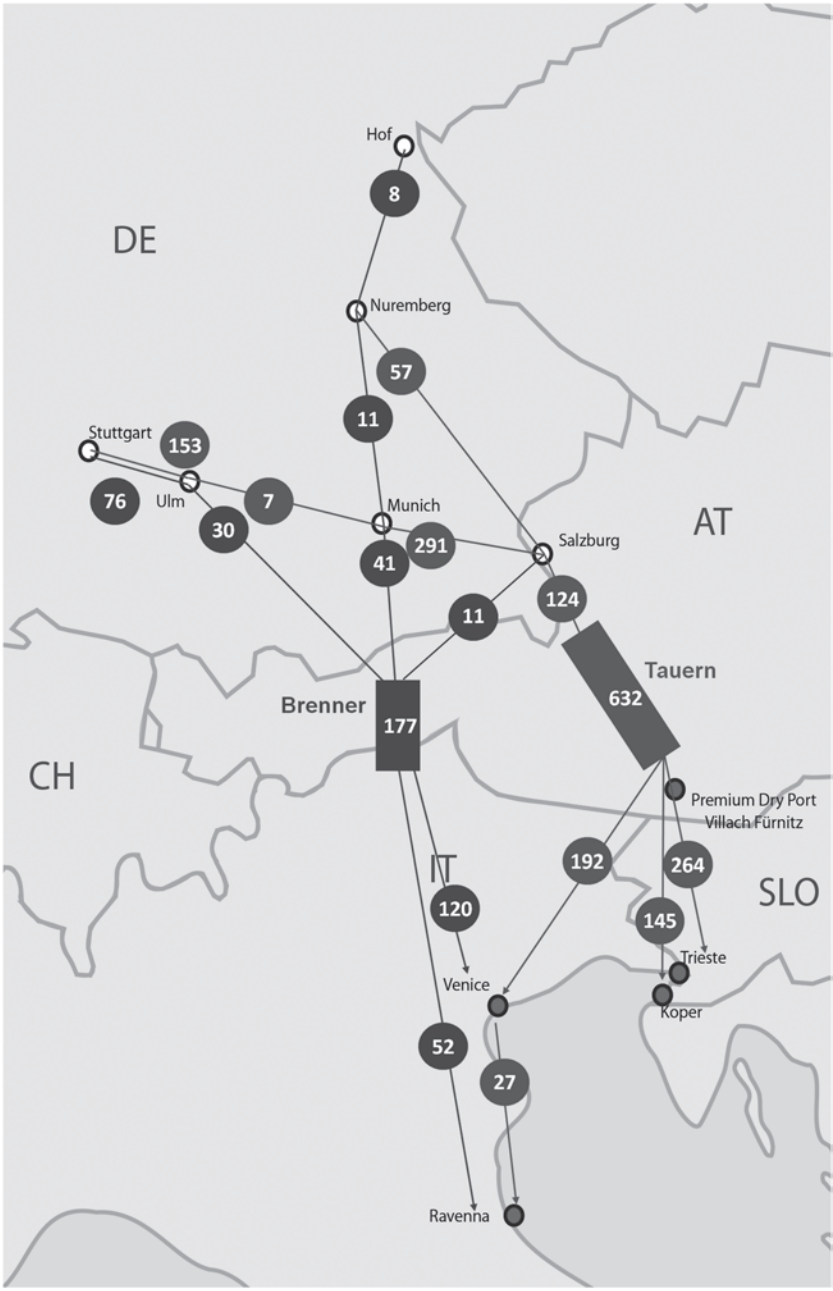


Fig. 16.2 Austrian import/export via maritime ports. (Source: BATCo)

16.5 The Economic Impact of the Baltic–Adriatic Corridor in Austria

The economic impact relating to the Baltic–Adriatic Corridor was investigated in a "Macroeconomic Review of the Baltic–Adriatic Axis" as part of an extended cost-benefit analysis in 2011 by the Austrian Federal Railways (OEBB). This review shows that the corridor joins growing economic regions in Eastern Europe with highly developed countries in Central and Southern Europe. It has been observed that the corridor brings sustainable positive economic impacts for Austria and the interested regions. The implementation and upgrading of the Baltic–Adriatic Corridor in Austria (Pottendorf line, Stadlau-Marchegg, Semmering Base Tunnel, Koralm railway) with an investment of 8.46 billion € results in an overall added value of 9.5 billion € in the construction phase and 5.5 billion € in the operational phase. This also means an average of 4000 jobs during the construction phase and about 15,000 sustainable jobs in the operational phase. Expected tax revenues would amount to approximately 5.3 billion €, of which 3.6 billion € is in the construction and 1.7 billion € is in the operational phase.

16.6 The Baltic–Adriatic Transport Cooperation (BATCo)

Since March 2010, a transnational partnership of 18 partners from 5 European countries—Austria, Czech Republic, Italy, Poland and Slovak Republic—has been working on technical, environmental and economic interventions fostering the sustainable implementation of the BAA in the frame of a European Transnational Cooperation project implemented through the Central Europe Programme and co-financed by the European Regional Development Fund (ERDF).

The Baltic–Adriatic Transport Cooperation (BATCo) was designed as a dedicated transnational support project (Table 16.1) for the inclusion of the BAA into the TEN-T core network. To achieve this, BATCo was meant to provide decision-makers at all levels (regional, national and European) with conjointly elaborated positive arguments on the importance and necessity of the BAA for the European Transport Networks based on consolidated technical and scientific findings. The main objective of BATCo was the sustainable and harmonised advancement of the BAA and to foster its competitiveness. Having accessibility as a precondition for economic development and growth, further objectives were: (i) to upgrade

Table 16.1 BATCo facts and figures. (Source: BATCo)

Duration	36 months, March 2010–August 2013
Total budget	3.599.093,48 €
ERDF contribution	2.802.112,27 €

ERDF European Regional Development Fund

intermodal transport connections—particularly accelerating the implementation of high-capacity railway connections along the axis, to foster a modal shift from road to rail and therefore to promote "green transports"; (ii) to protect the environment via the reduction of negative transport-related-effects and (iii) to secure employment by strengthening the regional economy.

Railway Infrastructure: Precondition for Sustainable "Green Transport"

Based on a state-of-the-art transport model, elaborated by BATCo and covering the area of the Baltic–Adriatic Corridor regions, several scenarios were developed for calculating and forecasting the effects of measures and policies (such as the removal of infrastructural, administrative and operational bottlenecks, increased costs for fuel and road tolls, etc.).

Calculation results based on these scenarios show that the overall transport volume in the European Union will increase up to 60% until the completion of the TEN-T core network by 2030. Therefore, the improvement of railway infrastructure and particularly the removal of infrastructure bottlenecks are essential. Moreover, they are a precondition to preserve the currently high modal share of Austrian railway freight transport. Otherwise, it would mean that the modal share of road transport would significantly increase by 2030.

The expected increase in road transport, mainly through the use of trucks, will have significant negative impacts on the environment and human health, as it goes hand in hand with an increase in air pollution (e.g. CO_2, PM10, NOx, etc.) and increased noise levels. Additionally, due to the fact that increased road transport implies more trucks on the roads, it is also expected that road safety would be negatively influenced with an increase in road accidents.

In order to increase the environmental friendliness of railways, in relation to the overall increased transport volumes, it is of utmost importance that the improvement of rail infrastructure is accompanied by supportive policy measures (e.g. road pricing, night-driving prohibitions for trucks, etc.) and it is necessary that measures for increasing the interoperability of the European railway system, particularly in border regions, is initiated by the responsible political and administrative levels.

In addition, railway operators need to be conscious of the fact that, in order to reach a positive change in transport behaviour and modal choice for both passenger and freight transport, the flexibility of the railway, which still is far behind road transport, needs to be improved and that new and innovative services have to be developed and implemented.

Logistics Centres Acting as Economic Incubators

In addition to technical and environmental analyses, BATCo dealt with economic activities, such as enterprises and Logistics Competence Centres (LoCCs), which are the main beneficiaries of an improved railway infrastructure. In this regard, LoCCs could play an important role since BATCo demonstrated that they have the potential to serve an incubator for the settlement of enterprises offering transport and logistics solutions and services. Therefore, a "Transnational Logistics Centre Incubator Concept" was elaborated in the course of BATCo. This concept is currently implemented in Villach/Fürnitz (Austria) as a pilot project, named ALPLOG, and briefly presented in the following section.

ALPLOG Carinthia: A "Premium Dry Port" for the North Adriatic Ports

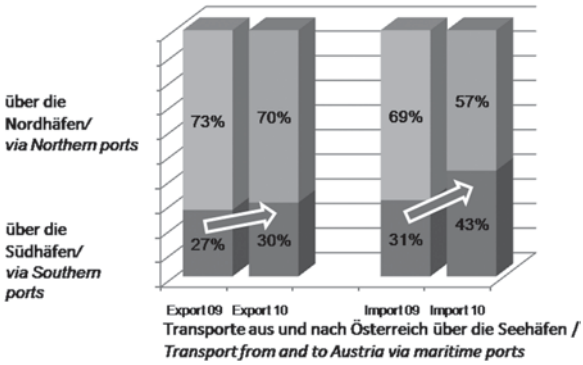
Carinthia is the southernmost region of Austria bordering Italy and Slovenia and, thanks to this favourable geographic precondition, Carinthia would be the perfect location for serving the hinterland of the North Adriatic ports. In addition to the advantage of railway accessibility, the main Carinthian logistics centre "ALPLOG" is located at the intersection of three Austrian highways with connections to Italy (A2), Germany (A10) and Slovenia (A11). A further benefit of the location of ALPLOG is the close proximity to the borders of Italy (20 km) and Slovenia (30 km). In particular, ALPLOG, located close to the city of Villach, benefits from the upgrading of its logistics infrastructure and it could offer the perfect location for development of innovative logistics services and solutions. ALPLOG provides headquarters for new enterprises focusing on shipping, innovative logistics solutions and services connected to logistics (Fig. 16.3).

Based on the developments at ALPLOG, BATCo lead partner "Regional Government of Carinthia—Department for Economic Law and Infrastructure" and BATCo partner "Development Agency of Carinthia" have signed a cooperation agreement with the NAPA represented by the ports of Venice, Trieste, Koper and Rijeka in order to implement ALPLOG as a "premium dry port" in the hinterland of the North Adriatic ports.

The importance of ALPLOG Carinthia for the North Adriatic ports is further strengthened by the analysis of transport volumes and flows between Southern Germany (e.g. Stuttgart, Munich, Ulm, etc.) and the North Adriatic ports via the "Tauern Axis" (along the former Pan-European Corridor 10). Figure 16.4 gives an estimation of the transport volumes between Italy and Germany with expected increases by 2030 for both the "Tauern Axis" and the "Brenner Axis". Considering the Baltic–Adriatic Corridor, there is tremendous potential for a premium dry port serving the North Adriatic ports in Austria.

Fig. 16.3 ALPLOG Carinthia dry port layout. (Source: BATCo)

Fig. 16.4 Forecasts of transport volumes (*1000 t/year) between Italy and Germany. (Source: BATCo)



Transnational Business Cooperation Alliance Serving as the Basis for Supporting the Regional Economy

From an economic viewpoint, the fact that enterprises, as potential end users of a well-developed Baltic–Adriatic Corridor, would be the main beneficiaries of increased transport volumes and improved infrastructure, BATCo has set up a network of Transnational Cooperation Points which directly support enterprises in their transnational business activities by providing services aiming to foster transnational cooperation and thus regional economic development in the regions along the Baltic–Adriatic Corridor.

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Chapter 17
Conceptualization and Planning of the Friuli Venetia Giulia Region as a "Territorial Strategic Platform" on the North Adriatic Gateway

Sandro Fabbro

17.1 Introduction

With reference to the northeast of Italy, the new value chains originated by globalization require a careful reconsideration of the original definition of the European priority corridors devised in the early nineties. Nowadays, it seems that corridors that run on a north–south direction, such as the Rhine–Alpine (former Corridor 24 Rotterdam–Genoa), the Scandinavian–Mediterranean (former Corridor 1 Berlin–Palermo) and the new Baltic–Adriatic Corridor, bringing Italy as well as the Mediterranean countries into closer contact with the richer and more dynamic areas of the so-called "Blue Banana", are those which seem to have more possibilities, in the short-to-medium term, to generate economic growth, in particular for the Italian northeastern territories (Dean and Fabbro 2011; Fabbro and Dean 2014; Honsell et al. 2006).

In the northeast of Italy, between the Adriatic Sea and the Eastern Alpine Arc, lies the Friuli Venetia Giulia (FVG) region. It borders with the Italian Veneto region, the Land of Carinthia in Southern Austria and the Republic of Slovenia. In geographical terms, the potentialities of this territory are evident. The region is interested by the following two important European corridors, in terms of both highways and railway infrastructures:

- The Baltic–Adriatic Corridor (along the north–south direction), which is a new one, is of interest in the region for the extension of the TEN-T project "Gdansk-Wien", from Wien to the North Adriatic ports (that currently are trying to cooperate through the North Adriatic Ports Association—NAPA).

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- The Mediterranean Corridor (along the east–west direction), which is the Trans-European Network for Transport (TEN-T) corridor linking Spain to Hungary (often referred to as former Corridor 5).

Through the Adriatic Sea, the FVG region presents direct connections with the southern Mediterranean Sea and the Suez Canal. This, in turn, means great possibilities to intercept a consistent part of freight flows between the Far Eastern countries (particularly China and India) and the most industrialized and developed Central European regions.

Due to the comforting forecasts regarding maritime trade trends and thanks to the regional favourable location, two out of three seaports in the FVG region, Trieste (the major port in the region and one of the largest in Italy) and Monfalcone (which is smaller than Trieste, but only 30 km far from it), could be interested by development programmes, aiming at significantly increasing the actual container-handling capacity. In 2011, these ports handled only ca. 400,000 TEU. Development projects could provide for the doubling of the existing container terminal in Trieste and the construction of a new terminal in Monfalcone. Thus, these ports could realistically increase the capacity to at least 2 million TEU in the next 10 years. Derived outcomes include the creation of new jobs, both in the short term during the construction phase and in the medium and long terms as a result of the increase in the logistic activities in the whole region (RAFVG 2011; Dean 2010; Dean and Fabbro 2011; Fabbro and Dean 2014). Furthermore, the transformation of the FVG region into a gateway of the European level could represent a chance to reaffirm, in a stable and convincing way, a new "specialty" for the existing regional Statute of Autonomy that originated during the Cold War epoch for safeguarding borders; it now seems to have lost some of its original legitimation (Fabbro 2011).

This perspective, also well known at the national level, requires a radical change in both the regional and national transport policies. Only with a decisive commitment for the development of seaports and the completion of the Baltic–Adriatic Corridor would it be possible for the FVG region and the northeast of Italy to become a global platform for international freight flows.

17.2 Platforms as Complex Territorial Strategies

Let us now introduce the planning concept of the region as a "logistic and territorial platform". In 2006, seven macro logistic areas referred to as "Logistic Platforms" were conceived by the National Logistic Plan (MIT 2006) in order to allow Italy to play a more relevant role in the global trade. Moreover, 25 punctual infrastructures, including airports, seaports and freight villages, were identified as the key nodes within these platforms. Nonetheless, the National Logistic Plan has missed a precise functional characterization of the logistic platforms and the main supporting infrastructure nodes afterwards appeared to be an exorbitant number if compared with the general tendency of reducing the number of unnecessary links and break-of-bulk points (Dean and Fabbro 2011).

Later, the 2007 National Strategic Framework (MSE 2007), a document aiming at integrating the national development strategies with the European directives so as to guide the allocation of European funds in Italy for the period 2007–2013, has instead defined 16 "Strategic Territorial Platforms" along the TEN-T corridors crossing Italy. For the northeastern regions, a "transnational strategic platform" named "Strategic Territorial Platform A4-Corridor 5 East" was defined. These platforms were intended mainly as innovative governance entities. Spanning different Italian regions interested by the major European transportation corridors, they should have had an important role in mediating the global and national interests with the regional and local ones, thus ensuring that the different territorial specificities would be opportunely accounted for during the decision-making processes of the European transport network. However, the real utility of these strategic platforms for the Italian territories as well as the possibility for their implementation in reasonable time has not been explored (Fabbro and Mesolella 2010; Dean and Fabbro 2011).

Finally, even the new 2010 National Logistic Plan (MIT 2010 and 2012) has not given any concrete response to the new transport needs and, furthermore, has not taken any concrete initiative to overcome the current economic and financial crisis. The plan has abandoned the "Strategic Territorial Platforms" approach, after only 3 years of its adoption, in favour of the early "Logistic Platforms" model, resulting only in a partially reworking of the previous 2006 National Logistic Plan.

The approach of the 2007 National Strategic Framework, with its 16 "Strategic Territorial Platforms", has left an important imprint from a methodological viewpoint and has demonstrated that an integrated system approach is conceivable, also in the context of the regional planning. The contents and objectives of the 2007 northeast transnational strategic platform have been recently taken up and relaunched in a book (e.g. Fabbro and Maresca 2014) that recognizes the need to promote this integrated territorial system, even through a campaign of strong visioning and political persuasion.

17.3 Friuli Venetia Giulia Region as a "Territorial Platform"

From this perspective, the Territorial Governance Plan of the FVG region (RAFVG 2013) interprets and plans the whole territory of the region as an integrated "territorial platform". It aims to recognize the peculiarities of its geographical location and the potentialities for a new model of regional economy strongly linked to trade flows between the Mediterranean Sea and Central Europe. In 2011, the absolute values of containerized traffic crossing the Suez Canal, to and from the Far East, corresponded to 18.35 MTEU. With a European absorption of approximately 31 MTEU, the Northern Range ports handled 20.4 MTEU. In comparison, the NAPA handled only 1.81 MTEU in addition to 120 MTON of other trades (MDST 2012). Considering that the demand for containerized cargo in Central and Eastern Europe increased by 390 % between 1996 and 2011 and that containerized traffic crossing the Alps from

Italy to Austria increased only by 14% during the same period, it is to be recognized that, although the opportunity was great, the performance of NAPA ports has remained low. The current capacity of the NAPA ports, equivalent to 2.5 MTEU, could be saturated by 2020, only in the presence of a 10% annual growth. Forecasts for the NAPA ports for 2030 range from a minimum of 2.6 MTEU (the double of its current handling) to 6.0 MTEU with consistent interventions in the port system and the rail network (MDST 2012).

However, before being planned as an integrated territorial and logistic platform, the region has to be recognized for its existing international freight transport assets.

- The port system, as already mentioned, is constituted by three main ports: (i) The Port of Trieste, which covers an area of 230 ha and whose banks reach depths of up to 18 m, currently handles 0.39 MTEU of containerized goods and 13.9 MTON of general goods per year (2011). It is estimated that the existing structures of the port could handle up to 0.6 MTEU per year. Therefore, the current use is more or less 65% of its capacity. New construction works foresee an increase in the port area to reach 385 ha. A new container terminal of 90 ha would allow to handle further 1.2 MTEU to achieve an overall port capacity of 2 MTEU per year. (ii) The port of Monfalcone, which covers an area of 60 ha and whose banks reach depths of up to 10 m, currently handles a small volume of containerized goods and more than 3.4 MTON of general goods per year (2011). New construction works would expand the port area to 135 ha and deepen its banks up to 13 m to host big ships in the order of 3000–5000 TEUs. (iii) The Port of Nogaro, which is essentially a local river port covering an area of 36.5 h, handles 1.5 MTON of goods per year (2012). New construction works would expand the port area up to 72.5 ha and deepen its banks to 8 m.
- The rail and road networks: (i) The motorway network comprises the toll highways A4 for 120 km, A23 for 121 km and A28 for 49 km. Freight flows cross the region in the order of 5 MTON per km per year. (ii) The railway network has double tracks for 299 km and single track for 170 km (including 85 km non-electrified). The level of use is mostly international with freight flows crossing the region with an international origin and destination in the order of 5.4 MTON per year. For comparison, international flows originating or arriving in the region are 5.3 MTON, whereas national flows are only 2 MTON per year (2008). The current use does not exceed 50% of the potential capacity, thus the rail network could move 7.5 MTON or 1 MTEU in addition. However, the railway network is poorly joined to the ports of Trieste and Monfalcone due to bottlenecks that must be removed. These interventions appear more urgent than costly. (iii) The main intermodal terminals are: the intermodal Terminal of Trieste–Fernetti, with an operating surface of 13 ha (25 ha total) and a rail link with 6 tracks for 13 trains per day and a junction with the toll highway A4. The Freight Village "Alpe Adria" of Cervignano, with an operating surface of 27 ha (46 ha total) and a rail link with 6 tracks, a capacity of 24 trains per day and a junction with the toll highway A4 at 9 km. The trucking terminal of Gorizia with a surface of 12.7 ha has a railway system nearby of 26.7 ha with 5 tracks, 1700 m of platforms and a capacity for 12 trains per day. The intermodal Wholesale Center of Pordenone,

with a total area of 74 ha, is connected with the toll highway A28 and has a rail link of 3 ha with 2000 m of platforms and a capacity of 16 trains per day. Furthermore, it is interesting to note that goods crossing the Alps in the FVG region are for two third via Tarvisio (north–south bound) and one third via Gorizia and Villa Opicina (east–west bound), an amount estimated at 10 MTON by rail and 50 MTON by road.

- The network of production zones: In 2011, the regional gross domestic product (GDP) amounted to 34 MLD €. The regional level of export amounted to 12.4 MLD € (mainly towards Germany, the UK and France) which is roughly equivalent to 36% of the regional GDP. The transport and logistics supply chain is the most important in the region both for service and production. It comprises, in fact, about 3000 companies which contribute about 30% to the realization of the regional GDP (MSE 2007). In the FVG region, there are 12 large industrial mixed zones of regional importance and 10 clusters of typical products including knife, furniture, agricultural food, wine, coffee, chairs, naval and marine products, thermo electro-mechanical and digital technologies and the Piasentina stone.
- The network of cities and territories: The region is not particularly populated, having only 1233 million inhabitants and a few major cities: Trieste, Udine, Pordenone and Gorizia. The territory is articulated in a number of municipalities (more than 200), but the very same Territorial Governance Plan tries to aggregate them in only 11 Local Territorial Systems (STL) with sizes ranging from the greatest STL Trieste—Monfalcone—Gorizia with a population of 306,000 inhabitants (marked by serious population aging) to the smallest of STL Maniago—Spilimbergo with a population of only 26,000 inhabitants (marked by population growth but poor infrastructural accessibility).

The structural and governmental integration of all these logistic and territorial components (assumed as a perspective in both the infrastructural and territorial regional plans, RAFVG 2011, 2013) is considered (see again the mentioned recent book by Fabbro and Maresca 2014) as a unique system worth planning and implementing as a whole and capable of pursuing two main regional objectives:

1. To set territorial strategies and regulations in order to plan a new spatial order, directly and indirectly linked to European transport corridors and their opportunities.
2. To generate conditions for the emergence of a new territorial economic base in a region that, due to its strong manufacturing base, is particularly suffering the current economic downturn.

17.4 Conclusions

We should not think that there must first be the logistics platform (RAFVG 2011) and then the territorial platform (RAFVG 2013). The two platforms, even if they refer to different actors, plans and programmes, must go hand in hand since they

represent the two sides of the same coin (see Chap. 1). The so-called regional Territorial Platform is a metaphor not only to represent a simple "Logistic Platform"—integrating the different logistic components in order to get a more efficient system of organizing and distributing the freight flows—but also to generate a new territorial economic base and a space order directly and indirectly linked to the main European transport and logistic supply chain. This perspective, to be effective, requires that public policies and spatial planning deploy these supply chains in the real physical territory as a precondition for attracting private investments to realize the infrastructure and also efficient operators in transport service management. These may be attracted only if public decision and regulation could assure a stable policy framework and certain and reliable implementation times and rules. Regional spatial planning instruments can play an important role in promoting greater political consensus about spatial strategies and in stabilizing land use regulations. In particular, the new Territorial Governance Plan, approved by the FVG region in 2013, should be strongly addressed towards pursuing these objectives.

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Chapter 18
Mega Transport Infrastructure Projects as an Opportunity for Local Cohesion

Flavio Gabrielcig and Milan Turk

The Friuli Venetia Julia (FVG) region in Italy and the territory of the Republic of Slovenia nearest to the Italian border, is a privileged area for the relations between Italy, the Baltic and the Central Eastern Union's markets, a significant aspect in light of the European Union (EU) eastward enlargement. The Province of Gorizia has defined several structural actions for the functional upgrading of this area by outlining the main strategic guidelines aimed at strengthening the local territory and its crucial role together with neighbouring Slovenian areas within the system of the national and international "large networks". In particular, the Province of Gorizia has tackled infrastructural aspects by acknowledging the specificities of a cross-border area, regarded as a crossroads between east and west, and assuming a central role, thanks to strategic decisions made at higher levels regarding the Venice–Trieste–Koper–Ljubljana axis (e.g. the Mediterranean Corridor).

The cooperation actions planned between Italy and Slovenia and the characteristics of their contexts confirm the role played by this cross-border area, especially in view of the economic development of European territories. Thus, these considerations have led to the assessment and planning of a new transport axis along the Villesse–Gorizia–Ljubljana line, with the aim of adequately responding to the east–west transport demand, supplementing the future realisation of the Mediterranean Corridor and further integrating the Baltic–Adriatic Corridor. Infrastructural actions have been prioritised with a view to develop the programmed scenario. This scenario has allowed to define the most urgent infrastructural needs, to select the core

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of an effective and dynamic partnership system and to identify a number of project objectives where resources and efforts have to converge.

The Italian/Slovenian cross-border area is characterised by a series of positive features, such as very mature and sound infrastructures (in terms of networks and nodes), and a very dynamic Slovenian counterpart, with an extremely important economic and infrastructural growth, already involved in national or international projects. However, the local system is marked by criticalities (e.g. cultural and language barriers, environmental sensitivity, etc.), which, in some cases, may be turned into strengths. In fact, the crucial role played by the FVG region in programming and strategy-making, with special reference to the definition of programmes and priorities, in close and direct collaboration between local administrations and the central government and the collaboration and dialogue with the Slovenian partner, characterised by a remarkable cooperative spirit, is well known.

The local territory around Gorizia, Nova–Gorica and Šempeter–Vrtojba can, therefore, be regarded as a junction area, where the link between large infrastructures and the local districts contributes to cohesion by creating synergies between towns and cities, networks and infrastructure nodes, all of which may be devised in view of achieving a rural and urban, integrated, flexible and sustainable development. The minimisation of the "destruction" of the local territorial capital and the promotion of a new use of the existing capital, avoiding the risk of becoming a transit area, without favourable repercussions on the local level, can be attained not only by identifying compensation and mitigation measures but also by integration, intermodality, accessibility and innovation.

According to this approach, the local section of Mediterranean Corridor should be regarded, within the existing framework of motorways, railways and logistic systems, as a node/network platform linking together infrastructures as well as urban and functional nodes in order to:

- Enhance the local intermodal potentials according to the existing or planned services (e.g. Ronchi dei Legionari airport, port of Monfalcone, new intermodal terminals and railway stations) and the local territorial characteristics (e.g. rural areas, rich in natural and cultural resources)
- Introduce compensation actions for the enhancement of the slow mobility system for both tourists and residents
- Safeguard the natural and rural character of the local areas
- Upgrade the existing railway track, so as to use it for a metropolitan railway system, across the Italian–Slovenian border
- Identify commercial/logistic/industrial nodes in accessible centres suitable for intermodality

Therefore, within the framework of the "Poly5" project, the province of Gorizia and the municipality of Šempeter–Vrtojba are carrying out studies targeted at recovering and adapting existing infrastructure, prioritising strategic projects, implementing environmentally friendly transport and defining innovative sustainable mobility scenarios. In particular, the upgrading of existing infrastructure will take into account the prospected route of the Mediterranean Corridor and the expected flows,

highlighting networks which could be concerned by direct development and those which could be interested by induced and corollary results of corridor realisation. In this framework, the plan requires the drafting of essential guidelines and documents for the joint and shared planning of cross-border transport projects. In particular, this area is interested by two local projects:

- The ADRIA-A project presented in greater detail below.
- A cycling infrastructure network running through local territories. In this regard, an analysis of the current situation has been carried out, based on the mapping of cycling pathways, both existing and planned (e.g. the pathways defined in the programming of involved public administrations). Thus, priority cross-border itineraries have been defined and included in a network with the Eurovelo and Bicitalia itineraries as well as the regional networks.

18.1 The ADRIA-A Project

Since the northern Adriatic cross-border area between Italy and Slovenia is fragmented and inappropriately exploited by the local population, the ADRIA-A project aims to create a unified, integrated Italian and Slovenian transport area by developing a light railway system (Fig. 18.1). The project intends to contribute to greater accessibility and cohesion of the cross-border area, both for the local population as well as for enterprises, with positive returns on the social and economic development of the area. Thus, the ADRIA-A Project is financed by the Cross-border Cooperation Programme Italy–Slovenia 2007–2013 and the following stakeholders are actively involved in the project under the leadership of Central European Initiative (CEI):

- Four competent national ministries (Slovenian and Italian ministries for environment and transport)
- Local authorities (regions, provinces and municipalities)
- The main generators of passenger transport (ports and airports)

The northern Adriatic area counts approximately half a million population, however railway lines are not entirely connected with many missing links. They are not integrated with other modes of transport, which results in a decreased capacity of the railway transport. This makes the railway transport uncompetitive. Furthermore, irregular accessibility levels result in lower development levels of some areas within the region and great differences between them. Consequently, within and around the area of interest, the use of road transport infrastructure is predominant with high adverse correlated effects. Therefore, in the entire cross-border area, the reorganisation of transport is urgent. To start with, greater accessibility could be achieved by developing the Italian–Slovenian integrated light train transport system. Environmental protection is a further aim pursued by the project, which strives

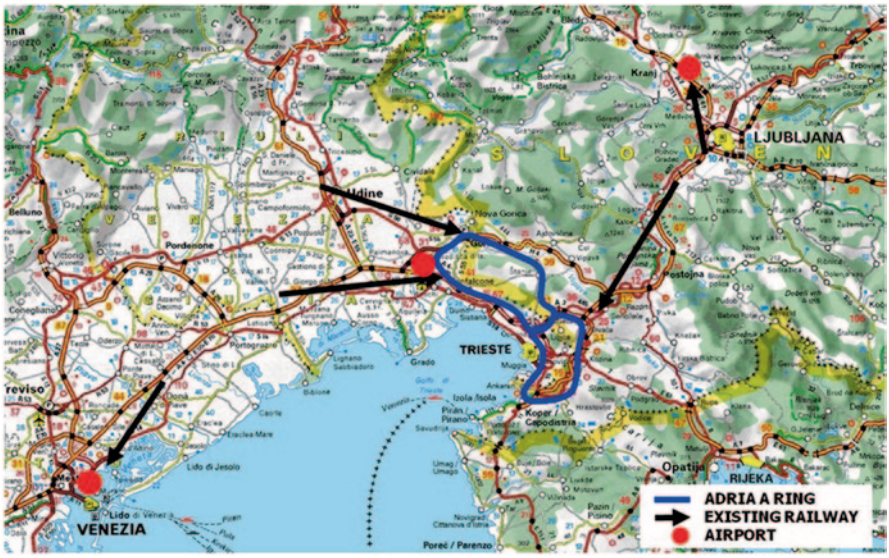

Fig. 18.1 The ADRIA-A light railway ring and its connection to other infrastructure systems. (Source: CEI, ADRIA-A Project)

for sustainable territorial cross-border integration with focus on the development of intermodal transport policies.

Thus, increasing competitiveness and attractiveness in the cross-border area can be achieved by connecting the entire greater area to local and nearby ports and airports. In doing so, the synergy between activities, transport systems and hubs could be established, further increasing and enhancing transport services as well as transportation with positive effects on tourism, the local economy, universities, research institutes, etc. To achieve these effects, the following tasks have been devised:

- Enhancement and modernisation of the existing railway infrastructure, which will connect sections within the mentioned area and also provide a connection to the EU transport corridors and other transport systems in neighbouring regions—thus, planning of feasibility studies for the missing links and upgrading of those rail connections which constitute bottlenecks on the infrastructure.
- The establishment of a transport model in the mentioned area (enabling shifts from one transport mode to the other—from road to rail—or, as the case may be, the integration of transport systems) and connection to major intermodal transport hubs (e.g. ports and airports) in the nearby vicinity, so that railway connections would work as support for those hubs and their development and foster their operation in conjunction to the light railway system.
- The establishment of a regulative policy to enable the connection between different transport modes through the harmonisation of tariff systems and unified ticketing systems.

- Formation of partnerships with a common management in the cross-border area (since, currently the operators of the railway infrastructure as of other transport systems are not connected, nor there is any coordination between them).

The ADRIA-A project is not oriented only towards the preparation of theoretical solutions, but also to the establishment of an administrative and operational basis with the aim to achieve actual goals of cooperation. For this reason, the FORUM and European Grouping for Territorial Cooperation (EGTC) entities (see description below) have been established to ensure that cooperation results within the ADRIA-A project would be taken into account and implemented in the territorial and transport planning even after the conclusion of the project. FORUM operates on the entire project area and its function is to coordinate strategic project plans while EGTC is focused on a narrower field of specific infrastructural developments. Eventually, these two institutions should develop into a permanent form of cross-border cooperation with the following goals:

- FORUM for *cross-border cities*—provides the institutional basis for the second phase of project continuation, the so-called ADRIA-B project, to improve the light railway system and the public transport system, to coordinate investment activities and to avoid duplication; it then would provide for other common priorities relating to the envisioned infrastructure along with the provision of guidelines for the coordination of municipal, regional and national development programmes.
- EGTC—provides for the coordination of urban design and traffic plans as well as the coordination of infrastructure investments in order to prevent duplication; it also provides for marketing with the aim to increase public and private investments into the area and it deals with EU funds.

18.2 Light Railway System: Planning the Gorizia–Nova Gorica Route

Greater Area: Intercity Connection

Between the neighbouring cities of Gorizia, Nova Gorica and Šempeter (Fig. 18.2 left) there is a need for integration of border public transport systems, which are currently separated and fragmented, leading to an insufficient use/demand for public transport. The planning of proposals for the development discussion is based on the analysis of existing freight and passenger flows and their potentials. On the basis of these information, also based on the development indicators and municipal development documents, an analysis regarding the state of the existing public railway infrastructure has been carried out to determine what measures (improvements/renovation/revitalisation) are necessary to ensure the introduction of the passenger transport and smooth operation/development of logistics activities in freight trans-

Fig. 18.2. *Left:* the area of three border cities. *Right:* design of the two missing rail-links. (Source: CEI, ADRIA-A Project)

port. In particular, new lines, electrification and some other technical equipment have been identified as priorities. The definition of all these measures in terms of costs is still under elaboration, especially given that separate studies are required for planning the new section of the route in regard to each specific transport service. For passenger transport, there is a need to establish (i) whether the existing stops along the railway line are suitably located or whether additional locations are necessary; (ii) and whether the equipment at stations/stops and its suitability are accommodated to the needs of passengers and adjusted to the contemporary way of living (e.g. sound system, light system, P&R, weather protection, accessibility for people with disabilities, etc.). Instead, for freight transport, important logistics and production activities have been developed on both sides of the border, Italian and Slovenian, forming an actual or potential asset of freight railway services. Thus, studies should envisage preliminary designs of the infrastructure for the integration of cargo and intermodal terminals for freight transport in the area, while taking into consideration motorways and traffic plans in progress.

Narrower Area: A Feasibility Study for the "Triangle Lines"

The route branching-off Šempeter–Vrtojba–state border–Gorizia and the railway line Nova Gorica–Sežana represents a connection of the Jesenice–Sežana railway line to the Italian railway network in the direction to the existing railway station in Gorizia and in the southern direction to the Gorizia–Sant' Andrea station. Currently, this line is not used for passenger transport, since there are important shortcomings related to this section; precisely two missing links, or two semicircular line connections that would form a triangle on the Slovenian and another on the Italian side (Fig. 18.2 right). These links would significantly rationalise the operation of the railway transport. In fact, while the existing railway infrastructure enables a direct connection between Gorizia and Nova Gorica and Jesenice, the connection from/to the Gorica–Sežana route is not possible, which is why the implementation of the triangle on the Slovenian side is urgent in order to achieve the efficiency of this railway line section. It is interesting to note that such triangle lines used to exist in the past and were constructed back in 1902; however these triangles, or the so-called lunette, were abandoned and destroyed after World War II as a result of the new state border.

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Chapter 19
Afterword. TENs and Visions for Cohesion of the European Space

Klaus R. Kunzmann

19.1 Introduction

Europe, in 2015, is not in good shape. It is not just because of the conflicts with Russia on the eastern border nurturing militant regionalism and the return of nationalism in Europe, nor it is due to the inability of the European Union (EU) to deal with migration flows coming from the Middle East and North Africa, or the unsolved economic conditions in the Mediterranean member states, caused by the financial turmoil during the first decade of the twenty-first century in a world where market principles are losing their social dimension.

Despite the impressive achievements of the EU and all the efforts and policies for territorial cohesion, Europe in 2015 is far from being a territory where all citizens can enjoy equal living conditions. The disparities between countries and regions, and within regions and cities, are growing rather than declining. On one hand, ambitious trans-European projects, like the Trans-European Networks (TENs), are being pushed forward to improve interregional accessibility across the old continent; on the other, European money is supporting the construction of bicycle lanes in remote rural areas to promote slow tourism and support ailing rural economies.

Experience has shown that implementing trans-European corridors is not an easy venture. In the introduction to this book, Sandro Fabbro has summarized the experience as follows:

> At the beginning of the TEN-T policies, in fact, many planning and institutional capacities, with their positive outcomes, were probably considered taken for granted, while the concrete experience has shown, particularly in these last ten years, that the "multilevel governance" (the method that has been promoted to coordinate European spatial planning, with the national and regional interests) has been quite ineffective, lacking procedures and tools to be implemented and leaving all the process on the shoulders and the good will of

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> the single partners involved. This book, on the basis of the outcomes of the Poly5 project, attempts not only to demonstrate that, at least on the Mediterranean Corridor (one of the corridors of the TEN-T), an effective coordination between the European, the national and the regional planning of the corridor seems to have failed, but also that an alternative approach could be pursued. The alternative proposed here tries to overcome two 'failures' that happen in the transport infrastructure sector: the typical 'market failure' due to a low transport demand and the 'failure of the state' that happens, in particular in rail transport, when huge public spending is connected with very little social and territorial benefits. The solutions usually adopted range from the reduction of public spending and intervention in the sector (in favour of a stronger liberalization) to a deeper economic and financial control on the utility of the infrastructure works. Although, these solutions are necessary, they seem not sufficient to address the above-mentioned double failure. So, our general hypothesis is that the above can be valid solutions only if intertwined with visions and strategies based on vertical and horizontal subsidiarity, where cities and regions can play a strategic role as key stakeholders in the spatial transformation processes.

Against all rhetoric assurances, many policies of the EU somewhat strengthen the centralization of economic power in metropolitan city regions, while many peripheral regions, as in the Alpine area, are struggling to maintain qualified jobs and slowly eroding private and public services. Even though there are many programmes for the obvious losers of European economic and infrastructure policies, they rather cushion the negative economic impacts of other policies. The EU Commission cannot be held responsible alone for the growing disparities on the continent. National, regional and local governments in the member states of the EU are willing allies or contributors in the field. They take with pleasure the generous offer of the European Commission to co-finance local and regional projects to relieve their debt-ridden budgets. For the sake of the European idea, which is still work in progress, they cannot be accused for their acquisitive attitudes.

19.2 Challenges of European Territorial Development

In the present turbulent politico-economic context, planners and decision-makers in Europe are confronted with multiple challenges (ESPON 2007a, 2013, 2014; Kunzmann 2010; Robert 2014). High youth unemployment raises questions about the right approach to education and training in society. With the aging of the population, public services for a fourth age of senior citizens have to be provided. With changing family values, families as the homestead of children are gradually being replaced by new forms of partnerships. Solidarity is replaced by individuality. Information overload and excessive public participation are hampering planning and decision-making processes. The complexity of things to be taken into consideration, when developing cities and regions is exceeding the limited absorptive capacity and ailing competence of local, regional and even national governments. Not surprisingly, on all tiers politics dominated by party ideologies and strategies are more and more falling in discredit. Complaining about migration flows and the treatment of refugees at the European level is one popular reaction to media reports about flows of refugees and migrants, opposition to local action is the other. The closer these

come to the local or even neighbourhood living spaces of people, the more the challenges are visible. On the ground, many actions for addressing the challenges are faced with "not-in-my-backyard" attitudes. Planners are well aware of all these challenges, though they know, or at least they should be aware, that solutions are not in their hands. Even when it comes to explicit spatial challenges, planners have only limited influence. They cannot change governance and develop peripheral regions in Italy, Poland or Scotland to compete with London or Paris, or even Naples and Bologna. Their power to accelerate structural change in old industrial regions is limited. Spatial planning cannot solve all the problems caused by value changes, political ideologies, financial strategies or economic policies rooted in, or just promoted by, vested economic and institutional interests (Kunzmann 2004, 2006; DATAR 2010; DG Regio 2013).

Spatial planning can contribute to address the problems by raising awareness, leaving the technocratic or academic ivory towers, improving communication, increasing better spatial information, moderating and bridging sector policies and showing possible pathways of spatial or territorial development. Planners can develop more holistic strategies to stop the marginalization of regions by exploring their territorial capital and launching strategies to better use this capital, promoting the role of small- and medium-sized towns for regional development and protecting public services from being sacrificed to efficiency criteria. They can also protect natural and cultural heritage by legal regulation and effective law enforcement. They can raise their voices when large land consuming infrastructure projects or massive industrialization of agriculture threaten to have negative impacts on local living spaces and local economies. With their generalist perspective of spatial development and their knowledge on the requirements of people and households, they can moderate conflicting interests of using land and resources. Planners have to bridge theory and practice in academia as in practice.

Can EU cohesion policy make any impact? The cohesion policy of the EU is a predominantly economic policy with limited spatial and social dimensions. Of course, it promotes the idea of Europe. The policy conveys the hope that regional disparities will be flattened, showing pathways into the future and forcing local and regional governments to articulate and sharpen their visions and aims. The policy intends to guide governments to develop their strategies for the implementation of local and regional development, and distributes limited financial resources for local projects to encourage further action. Cohesion policy could be instrumental to influence sector policies to better address the challenges of (unintended?) territorial impacts.

Moreover, cohesion policy will transfer knowledge by communicating best practices, strengthening competence to deal with local challenges, and it will set quality standards according to EU wide norms and regulations. Overall, EU-cohesion projects are great learning projects for planners, politicians as well as for citizens. The Poly5 project has been one such learning project, linking local and regional competence to European knowledge. This book has documented these complex learning processes.

19.3 Challenges of the TEN-T Project

Developing the Trans-European Transport Network (TEN-T) is one of the more significant EU responses to the challenges mentioned above. The project is unanimously supported by the member states. They all expect positive spatial impacts on their national territories. The rationale of the ambiguous and costly project is obvious: for example, improved trans-European accessibility is strengthening the global competitiveness of Europe as a whole. It will reduce travel and transport times between metropolitan city regions. The network will better link Eastern to Western Europe. At the time of the Cold War, the East was cut off from the thriving economic development of the West after World War II. The network will certainly accelerate spatial cohesion of the European territory, though rather between countries than regions. Countries in the European periphery, such as in the North, the East and the South of the continent expect better linkages to the European core. Countries in the core, such as Germany, Austria or Switzerland, expect relief on their congested transport corridors, as too many trucks are transporting food and other goods between the Mediterranean and the Northern countries. A better trans-European network will certainly contribute to deepen the single European market and strengthen the political and economic dimensions of Europe in times of globalization and technological change. Hence, it is perfectly understandable to develop and promote the TENs (Fig. 19.1).

Obviously, the project has winners and losers. The winners are European city-regions which the networks link. Port cities, particularly, will welcome the network, as they will greatly benefit from improved connectivity and faster accessibility. Then, the consulting and construction industry designing and implementing the network, will benefit, as well as logistics industries and the growing e-shopping economy. The realization, management and maintenance of the network will create and sustain a broad range of jobs. Researchers all over Europe, from many different disciplines, have already been commissioned with studies to explore the best alignments of corridors. They have carried out numerous feasibility and impact studies to support the realization of the network. There are also moderators, who have been asked to manage the participation process and communicate with people and landowners to minimize conflicts between vested interests of potential winners and losers.

There are losers as well, villages, cities and territories which sit in the shadow of the trans-European transport corridors. They will suffer the negative implications of the network. Their geographical location will be less attractive for investors searching for new locations, and it will add burden to local economies with higher access costs to the network. In addition, they will experience stagnation of financial means to maintain or even develop local and regional infrastructure, as higher budgets are needed to support the implementation of the transnational corridors. Shifting scarce financial means within the public sector will be unavoidable. However, the European rationale will find more political support by national governments than the regional or even local rationale. In the end, no funds will be available to provide

Fig. 19.1 European new infrastructure. (Source: Formato 2014)

for "less important" and "less convenient" infrastructure for people who wish to stay where they are living. Due to the shift of investment, school children, workers and elderly people will have to spend more time in commuting or reaching public services. Consequently, they will be the prime losers.

19.4 Pathways into the Future of European Space

Realistically, in contrast to the often expressed hope of the community of (mainly academic) spatial planners in Europe, there are no paramount policies for the future development of European space. Experience made with the European spatial development concept (CEC 1999; Faludi 2014) shows that in the sociocultural environment of a politically diverse Europe, which is dominated by market forces, there is no willingness to accept a top-down strategy for the development of the European territory. Only very few member states of the EU have such a politically approved concept for the national territory guiding local, regional and national development.

With regard to the present mistrust in any form of top-down European intervention into national or regional spatial development, and for the sake of preserving European regional cultural identities, such a technocratic concept would not make sense at this moment. Given the power of the market and the vested interests of national governments, any comprehensive spatial concept would be another EU paper tiger rather than a guideline for action. A Pan-European territorial concept will not find political support in these circumstances.

However, a society needs visions and simple narratives to show pathways into the future. The Europe of tomorrow will be as heterogeneous as it has been for more than a thousand years, it will be a patchwork of regional economies, based on the respective territorial capital and the power of regional governance. Under a Pan-European umbrella and national supervision, clearly metropolitan city-regions will dominate and compete for investments, qualified labour and events. In their own interests, and depending on local guidance and willingness, these metropolitan city-regions will take some responsibility for maintaining endogenous regional economies and appropriate living conditions in their wider metropolitan hinterland. In Germany, the term "Verantwortungsgemeinschaft" (intra-regional solidarity) has been coined to define this relationship between core and periphery (Sinz 2007).

ESPON, the European Spatial Observatory Network, has published scenarios for the European territory towards 2050 (ESPON 2007a). Notwithstanding substantial research data and a set of assumptions, the vision is not visionary enough and it does not show pathways into the future space of Europe. The scenarios do not really add value to the European Spatial Development Perspective (ESDP), which has disappeared from the political agenda, after the extension of the EU. The recent ESPON scenarios are, rather, a list of policy goals. Everything is correct: *connecting Europe globally, promoting co-development with neighbouring regions, unleashing regional diversity and endogenous development, supporting a balanced urban structure and managing natural resources sustainably*. All this needs to be done. These goals are mostly communicated by the spatial planners' community. They are, at least rhetorically, also the often-stated goals of the EU and national governments. However, policies to achieve these goals by appropriate programmes and actions of the European Commission are not noticeable.

In 2015, Europe is muddling through the crisis. The "old" continent is trying to cope with challenges, especially in the east and in the south. The metropolitan city-regions are doing business as usual, with some emphasis on improving city-region mobility, on affordable housing, on energy management or dealing with the implications of aging and of a cosmopolitan society and on the growing disparities between richer and poorer households. All this is done in a broader economic, politico-administrative and sociocultural political context, which does not offer easy solutions. There is much "Ratlosigkeit" (helplessness) when it comes to defining in which direction Europe will or should go, or wishes to go in a globalized world. Should "old" Europe rely on its historical and cultural roots, or should it follow the market-led modernity path of the USA? How will it deal with the evolution of China as an economic world power and what will be its relationship to Africa? All

this will have considerable impact on the European space, on cities and regions in the member countries of the EU respectively.

In the past, many visions have been devised for the European space, though few have had an impact on development. The following storylines are just a very brief holistic narrative on a few visions of Europe, seen rather from an external global perspective, than a European viewpoint. They are storylines to stimulate the imagination for developing local, regional or even national strategies. Thus, where should Europe go?

19.5 Europe: Cultural Theme Park of the World

This storyline is obvious. Culture is generally seen as a key territorial potential for urban and regional economic development in post-industrial societies. Europe is a unique cradle of culture and history. To an extent, Europe is already a kind of a cultural park today. The paramount wealth of its cultural heritage is exceptional. Not surprisingly, this cultural dimension of Europe is one reason why the continent is the prime target of global tourism. The immense cultural heritage of Europe attracts more and more visitors from around the world to its numerous small, medium-sized and big cities. This potential is widely used. Most urban as well as regional development strategies in Europe rely very much on the cultural capital of cities and regions, whether it is of global or just local importance. This is one reason why the conservation of the urban and heritage is a key concern of city development as well as the development of cultural infrastructure or the establishment of specialized universities. Cultural creativity is seen as an essential in promoting creative industries. Many local and regional economies in Europe are linked to culture, heritage and the related cultural, creative and tourist industries. From traditional crafts to innovative research, the field offers a large job market for a broad range of professions.

From Venice to Tuscany, Aix-en-Provence to the Massif Central, Bavaria to Brandenburg, Scotland to Sardinia and Salamanca to the Canary Islands, Europe could become a second and third home continent for the affluent middle and upper class of the world, especially from Asia, Russia and North America. Offering courses in European history and culture, music and performing arts, or courses in crafts and design, while enjoying relaxing days in a European village, town or urban quarter, would provide local and regional jobs. The focus on culture would encourage cities and regions to maintain their high level of cultural infrastructure. It would inspire the real estate sector to intensify services for global buyers. Promoting Europe as a cultural “theme park” would support strategies at institutes of higher education to specialize and promote culture-related educational programmes, following the success of Italian, German and French academies of music, film and design. Culture and food are closely interlinked. Hence European gastronomy and its considerable job dimension would be an essential element of such a cultural policy. Appropriate mobility strategies would serve such cultural tourism and related education and training programmes, such as the ones for gastronomic sciences at universities in

Piedmont or San Sebastian. Many other policy arenas would follow and develop strategies for future economic development related to the broad field of culture. Europe's economy would benefit from the global theme park image.

19.6 Europe: A Pastoral Continent

Europe has a long tradition of agriculture and food production. Agricultural products from the continent are exported all over the world. Consumers in Asia, America and the Middle East enjoy European wines and oils, bread and cheese, fruits and meat. In Europe, regional food branded and controlled as bio-food, is gaining more and more importance.

Economically, socially and culturally, the sector is more important for Europe than people normally would believe. Germany, the second biggest food producer in Europe, is still producing 80 % of the food, 10 % of which is already following EU regulation for biological food production and the demand is growing.

While industrial mass production is gradually moved from Europe to China and India, and soon to Africa, the growing number of people in those countries and regions would need to have access to food. Fertile agricultural land in Asia is scarce. For climatic reasons, Africa is not in a position to meet the annually growing demand for agricultural products. Latin America is too far away from Asia and the Middle East. Thus, another shift can be observed. Recent trends show that young people in big cities in Europe are pleased to return to rural areas and pioneer new agriculture-related businesses. They try to escape from the stress in the big city and enjoy simple life in rural areas. They may do it just for romantic reasons, for a limited time period only, or as they wish to commit themselves to more sustainable lifestyles.

Considering such observations and trends, why not try turning Europe into the food basket of the Middle East, North Africa and China? While uncontrolled urbanization and industrialization processes damage the eco-systems of Asia, the Middle East, Africa and Latin America, benefitting from 2000 years of knowledge in food production, Europe preserves its diverse and cultural landscapes by promoting food production as a key element of the regional economy. Ecological objectives, low carbon principles and resource conservation determine endogenous regional policies. Integrated policies promote rural–urban economies and intra-regional economic circuits. Principles of agro-tourism prevail in tourism policies. Silence, learning and nature observation are the key assets of European holiday regions. Policies to promote traditional medicine and cultivate medical herbs complement agricultural development strategies. Where agricultural production is not feasible for soil or other reasons, forests and nature parks will be extended across Europe. The strategies could be linked to tourism policies, attracting global tourists to Europe, who wish to enjoy rural landscapes, food and cultures in a diversity of agricultural sceneries, be it just for consumption, or even for participating in cultivating processes.

The remarkable success of the slow food and slow city movements is an indicator of changing values and attitudes in Europe, which could support policies to accept Europe as a sustainable pastoral continent. Pastoral Europe could easily become the prime target of citizens suffering from authoritarian technocratic regimes in smart cities around the world.

19.7 Europe: Knowledgescape of the World

Knowledge is often identified as the new resource and survival strategy of Europe in the Asian century. National governments are gradually raising the expenses for higher education and research. International corporations are expanding their research and development activities, even establishing their own corporate universities and training centres. Innovation has become a key concern. Public and private universities are graduating more and more students and tend to attract more and more research contracts. British universities are leading the field in Europe and have become great earners when it comes to attracting students from Asia, Africa and the Middle East, who willingly pay enormous fees to get a certificate from a renowned university. Even scientific publishers are dominating the market of academic literature. Cities such as Heidelberg, Oxford, Cambridge, Lund, Delft, Bologna or Salamanca are benefitting from the reputation of their traditional universities.

Knowledge is more than competence learnt at a university. Germany is known for its efficient vocational training system, which provides skilled manual labour for innovative industries. In addition to its successful export of industrial products, the country has even started to export this system to other countries. Lifelong learning is gradually becoming a key concern of the post-industrial society in Europe.

Building on such trends, cities and regions in Europe could intensify their efforts to better organize the transition process from an industrial to a knowledge society. Supported by national governments, in partnership with local and regional stakeholders, they could enhance their local "knowledgescapes". Urban development strategies, which centre on knowledge development, would have to rethink location decisions and relocate institutes of higher education into inner city campuses, where the knowledge institutions could be better integrated into the urban fabric. By creating urban environments for learning and living, for sports and entertainment, they have to meet the expectations of the "creative" class. Existing military barracks, obsolete industrial structures and vacant shopping centres could be converted into attractive inner city knowledgescapes. The intended conversion of the international airport of Berlin Tegel into a university could be a good model. In addition to such physical action, local and regional policies would have to rethink urban development priorities to welcome cultures for students from around the world. Industrial cities could explore how obsolete industrial production sites, steelworks and coalmines could be turned into education and training centres for target groups in Latin America, Africa or Asia and even North America. Small and

intermediate cities could learn from Oxford, Delft or Heidelberg how to gain new importance as spatial knowledge foci of higher education and e-learning by offering local environments, which meet lifestyles of students and researchers for graduate and postgraduate programmes or shorter face-to-face workshops. All this could be done to reinforce Europe as a prestigious "school" of the world.

19.8 Europe: A Smart Continent

In recent years, global corporations such as Siemens, Cisco, IBM or General Electric are undertaking considerable efforts to promote smart technologies for solving urban problems. Under the slogan "smart city", they offer services to address urban challenges, such as personal mobility, congestion, delivery of public services, energy conservation or demographic aging. Prompted by their initiatives and marketing power, the label "smart city" has become a much applauded paradigm of cities in Europe (and elsewhere). Confronted with the manifold implications of new information and communication technologies, particularly the iPhone technology, on urban life cities, city governments have started to explore when, where and how new smart technologies can be used in urban development. Great promises made by the corporate advocates of smart technologies seem to seduce or even convince politicians and city managers to support a quick transition from traditional to new technologies: they have started to develop the required technical infrastructure for their city-wide introduction. Energy can be saved, senior and disabled citizens can have better access to public and private services, individual mobility can be increased and safety can be improved. Shopping attitudes may change and tourists will explore cities differently from how they did it in the past under the advice of real (not iPhone) tourist guides.

Exploiting the potential of smart technologies, city regions in Europe, which are accommodating 80 % of Europe's population, could promote smart city development and start investing in the required urban infrastructure. Similar to the developments in the beginning of the last century, when fast-growing cities of industrial regions built water and sewage infrastructures together with telephone networks and underground metro systems, such a move would create new qualified employment in cities. New professions covering this field will replace labour trained in traditional engineering and planning disciplines. New institutions will support teaching senior citizens how to apply new smart technologies in everyday life and sustain or improve their quality of life. Smart technologies will favour higher densities and support the development of compact cities, thus contributing to resource conservation. This is a fine chance to reduce the consumption of land for urban development. E-shopping will change the nature and character of inner cities. Shopping malls will be converted into showrooms for products, like museum shops. Fun shopping will influence the design and the use of public spaces. Language is no longer a problem in the smart city. Smart translation technologies in hand will support the cosmo-

politan dimension of cities. Rural regions in turn could join, albeit in quite different forms. Smart technologies will facilitate rural regions to survive. They will enable people who prefer to live in low-density regions to have convenient access to public services, such as welfare, health, education and public transport.

19.9 Europe: China's Special Economic Zone

China is a hope for Europe, not a threat. Since the Chinese economy is thriving, Chinese investment in many countries in Europe is growing considerably. Particularly in the technology sector, more and more Chinese firms are buying up European firms, which are producing for European and Chinese markets. Chinese production already takes place in industrial production zones in Italy, Romania and Spain. The port in Athens is partly owned by Chinese companies. Chinese investors are active on former airfields in France and Germany. China is speeding up transport linkages to Europe. Two decades from now, high-speed trains from China will arrive in Eastern Europe. Huawei, the electronic giant, is getting more and more involved in building up innovative information and communication systems in Europe. Alibaba's e-shopping empire will soon follow. China is investing in European agriculture and forests. Chinese students are by far the largest batch of students at European universities. Chinese tourists have discovered Europe as their favourite target. Chinese creative industries are slowly catching up with their American and European competitors. Chinese newspapers are serving the Chinese readers in Europe. The European interest in Chinese culture and language is rising. Gradually, China, the new world power, is arriving and raising its presence in Europe.

Keeping all this in mind, it could make sense to welcome even more Chinese investment and establish special (free) zones for Chinese investors in Europe. This could be done in former industrial areas in Slovakia, Poland or Eastern Germany, with high unemployment, but easy access to European and Chinese markets. Here, Chinese corporations could co-operate with European enterprises to produce automobiles for the European market and to avoid long-distance logistics. European institutes of higher education could be encouraged to develop joint science and technology parks with Chinese universities, where Chinese graduates in Europe would co-operate with European engineers to develop the next generation of industrial robots for industry 4.0 processes or even high-speed tramways for city regions in Europe and beyond. To attract media and the interest of European developers, Chinese architects are invited to produce master plans for these industrial zones. They could also be asked to make designs for the adjacent flagship technology parks and housing compounds for Chinese engineers, technicians and researchers. Experience in China has shown their immense creativity when it comes to design smart future-oriented buildings.

19.10 Europe's Industrial Belt in North Africa

For a short time, the Arab Spring triggered off a rethinking of European development and migration policies in the Mediterranean region. However, with growing conflicts between traditional and liberal societies, the enthusiasm was soon over. While the number of refugees from the Middle East and North Africa is increasing weekly, the EU does not have any reasonable strategies to cope with the issue. The Mediterranean Union, headquartered in Barcelona, is a sleeping institution. It is getting hardly any significant support from the political leadership in Europe. The issue would need a new initiative, though times in the second decade of the twenty-first century are not favourable for any effort to revitalize the idea of bridging European and North African development.

However, why not initiate, together with Turkey, Israel and Spain, and eventually oil-rich Nigeria and Sudan, a joint European-African integration zone? This zone could qualify for funding from a financial programme, similar to that of the Marshall Plan, which revitalized the economy of Europe after World War II. This plan could even be jointly implemented with China, which is already very active in North Africa and does not suffer from notorious colonial memories in the region. The aim of such a "Mediterranean Marshall Plan" would be to develop a new industrial belt in North Africa. Following the model of China, free economic zones would first be established in the region, with good accessibility to efficient port facilities. These zones would receive energy from huge solar energy plants in the Sahara and water from solar energy driven desalination plants along the Mediterranean coast. Instead of transmitting energy from Africa to Europe and trying to stop labour from Africa from seeking passage to Europe, the continent would develop industrial zones in North Africa, which could trigger off further industrial development in the whole region. While unqualified labour is ubiquitously available, qualified technical labour would have to be educated and trained in technical colleges and technical universities, established under partnership programmes with German, Czech, Italian or French industries. Technology parks could be attached to the institutes of higher education to promote innovative industries for North African economic and social development. Such a North African industrial belt could learn from China and replicate the success story of China's successful industrial development to target the whole African continent. In the long run, Europe's industry would slowly move down to North Africa.

19.11 Conclusion

The above holistic storylines of European spatial development are just narratives of possible pathways into the European space and visions that regions may consider. The storylines are not alternative scenarios for strategic planning or political action. Some narratives are more obvious than others. Some may be wishful thinking or

just irrelevant. Sometimes they describe overlapping narratives, which focus on selected spatial development trends and options from a holistic perspective. To some extent, they could also complement each other.

What do the above storylines have to do with the TENs? What do they have to do with EU cohesion? At first not very much. The storylines of selected potential pathways to spatial development in Europe and the ambitious TENs project of the EU, in the context of EU cohesion policy, represent two quite different perspectives. The purpose of these storylines is to raise imagination beyond mainstream spatial development concepts. The TENs programme, once implemented, will contribute to further the cohesion of European states within the EU. It will also give regions in Europe a chance to develop their own profiles, while being linked to Europe and the world. Europe is and will remain a mosaic of regions, regional economies and cultures.

Against all rhetoric statements and assurances, the European transport and network will further contribute to the concentration of economic activities in Europe. It will serve the metropolitan city-regions benefitting from the network. The hope that regional access systems will soon follow the realization of the TENs is simply illusive.

However, the trans-European corridors are perfect training grounds for European cooperation, for balancing European and local interests, for communicating with citizens and entrepreneurs. Though this training is more than a few seminars and a few public participation shows and seminars, it requires continuous on-the-spot communication among all stakeholders involved, a lot of trust and patience and above all, a clear vision. For a transport corridor the vision is obvious. There is a beginning and an end of the corridor, and there are numerous obstacles in between which have to be removed, not by power or financial promises, but by communication and mutual trust. Only offering visions and building up trust will bring the solution. No vision, no communication, no cooperation, no trust, no corridor.

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