Discontinuous Regions: High-Speed Rail and the Limits of Traditional Governance

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ABSTRACT

Globalization and the interconnectivity of the economy have magnified the role of regions, restructuring social and economic relationships into networks that span increasing distances. At the same time, greater attention is due to localized urban quality, as non-vehicular modes and compact forms of development become critical in an environmentally conscious world. Within this context, increasing interest and adoption of high-speed rail (HSR)—a mode that addresses multiple scales—is unsurprising. HSR technology is used both to respond to existing trends of increased interconnectivity between urban centers and to enhance economic connections within regions and mega-regions.

HSR has the unique ability to enable long-distance commuting across discontinuous regions that are far enough apart so as not to be adequately integrated by auto travel. This new geography of daily experiences has important potential implications for governance and relations among cities.

Using Portugal as a case study, this paper examines the relationship between HSR development and new models of spatial organization and governance. Based on interviews with national and local officials, we discuss ways in which HSR planning is changing attitudes towards regional identity and urban governance, including: the integration of national entities into local planning processes, the potential for new models of commuting, and the role of HSR as an exogenous catalyst for regional cooperation.

The case study reveals how HSR can serve as a catalyst for governments to rethink regional identity, intergovernmental relationships, and competitive positioning. The prospect of HSR implementation raises the profile of potential intraregional complementarity and highlights the importance of inter-governmental relationships.

ENVIRONMENTAL CHANGE AND SOCIAL CHANGE

Several decades ago in *What Time is this Place?* Kevin Lynch asked one of the oldest and most difficult to answer questions within urban studies: "What…is the relationship between environmental change and social change?" He goes on to enumerate various examples of this "loosely coupled" relationship (*1*). The simplest case is when a society wishes to alter its physical environment in a specific way—housing construction, irrigation, etc.—and so creates or alters organizations to accomplish the task:

> Should we want to cause a major environmental change, it is usually necessary or expedient to make some selected social changes as well, particularly in the nature of institutions...These institutional innovations may in time have secondary effects elsewhere in the social fabric. (*1*)

The period of high-speed rail (HSR) development corresponds to a time of increasing focus on the spatial implications of globalized network economies. HSR can change the time-space landscape, blurring the distinction between inter-city and intra-city travel, between urban and periphery, between global and local. HSR has greater potential than air travel to affect urbanization patterns because of its ability to directly connect city centers and avoid the significant pre-boarding time associated with air travel. Its technology therefore is sought to enable the formation of polycentric agglomerations of urban areas—mega-city regions of networked nodes that act as functional economic units at the global level (*2,3*). Simultaneously, the complexity of information-based tertiary economies and the challenges of sustainability both emphasize the importance of localized urban quality. The rise of information technology, rather than heralding the death of cities, only seems to have augmented agglomeration economies, as face-to-face interaction and labor specialization become ever more important (*4*). HSR has a clear competitive advantage over other modes as long as it connects urban centers, thus joining existing urban mobility systems with new regional accessibility. Similarly, real estate development potential depends on station accessibility and local development policies (5, *6*).

HSR development, therefore, occurs within a context that is simultaneously highly global and very local. The goals of HSR network development extend beyond the limits of single jurisdictions—to the regional, national, and even international (European Union) level. While HSR certainly creates the possibility of more sustainable economic growth, the realization of this promise depends, in part, on local land-use and accessibility planning, which in turn depends on local expectations of benefits from HSR. This research investigates perceptions and planning processes surrounding HSR at the national and municipal level within Portugal. It examines the relationship between large-scale environmental change and relevant multi-scalar social or governance changes.

This paper will be organized as follows. First, a historical perspective offers background on the relationship between transport and regional form. Next, a review of the arguments for regionalism is used to define the potential relationship between form and governance. The latter part of the paper presents the case of HSR planning in Portugal and demonstrates the role of large-scale infrastructure development as an external catalyst for changing approaches to regions and urban governance. While implementation of HSR in Portugal is currently postponed for the immediately foreseeable future due to fiscal austerity, lessons can nevertheless be drawn from the process up to this point. The suspended action, moreover, may create space for new thinking on the role of HSR in regional development. In this vein the paper's conclusion proposes directions for future work.

TRANSPORT AND METROPOLITAN DEFINITION

The relationship between mobility and metropolitan form is much studied and, at least at a basic level, well established (*7, 8, 9, 10*). The spatial definition of a metropolitan region is the result of millions of individual decisions regarding residential, employment, and business enterprise location. When aggregated, these decisions create a complex web of activity locations and the mobility infrastructure connecting them. The dominant activity for many people is employment; therefore, metropolitan regions can be defined in terms of labor market reach. Given the stability of people's daily travel time budget (*8*), changes in transport technology result in changing metropolitan form. HSR is the latest in a long history of technology changes altering the relationship between space and time, and therefore the feasible realm of daily activities.

THE REGIONALISM ARGUMENT

Actively discussed, if less clearly implemented, is the notion that as metropolitan areas grow to span multiple jurisdictions, so too should scales of "urban" analysis, intervention, and according to some (*11*) governance.

The basic argument for regional governance goes as follows: Fragmentation of land use and transport policy leave each municipality to act in its own self-interest, pursuing policies that will maximize local property values, attract higher-income residents, and minimize the burden of demand for local public services (*12*). At this disaggregate level competition dominates. Each local government does its best to attract residents and revenue-generating businesses while avoiding undesirable land uses and lower-income populations.

Beyond the troubling social equity issues and the tendency towards less efficient uses of land, organization at this disaggregate level also cannot cope with the needs of larger systems. For example, effective watershed management, minimization of land consumption, congestion mitigation, and larger-scale energy policies all require levels of organization at a broader geographic scale.

Transportation, as a network phenomenon, presents a particular challenge at the disaggregate level. Well before the advent of the automobile era, labor markets began to span multi-jurisdictional regions. Despite more recent attempts at using land use planning to shorten trip distances (*13*) daily commutes seem ever more likely to cross jurisdictional boundaries (*10*). Moreover, spatially dispersed networks of clients and service providers have been continually increasing the demand for regional business travel (*2*).

It should come as no surprise then that the push for a larger scale of regional government has often been associated with the demand for rational mobility planning at a scale that matches expanding daily activity zones. In the United States, Metropolitan Planning Organizations (MPOs) were created to coordinate the investment of federal transport funding. In some places this legislatively mandated form of governance has attracted other regional duties. San Diego's MPO, for example, has since the 1970s gradually accumulated the responsibilities of land use planning, housing needs determination, and spending of state sales tax revenue (*14*). Other forms of regional transport-related governance include "special-purpose governments" (*14*) such as transit agencies and the more recent federally mandated Intelligent Transportation System (ITS) Architectures (*15*), which ensure consistency of ITS projects thereby de-facto creating inter-governmental and inter-agency cooperation to establish and manage the "architecture." Moving up to the scale of mega-regions, the current HSR-planning process in the Northeast Corridor of

the United States is being managed by the Federal Railroad Administration (FRA) in cooperation with multiple states. To meet these larger-scale concerns, the FRA is making a transition from its prior regulatory role towards more strategic thinking.

Consideration of the relationship between transport and metropolitan form has of late expanded to encompass larger and larger geographies. In the European Union (EU), in particular, spatial policy is explicitly linked to transport policy, and backed by structural cohesion and European Investment Bank funds. In the last decade the EU prioritized national and international HSR connectivity. The program for the trans-European transport network (TEN-T) includes 14 out of 30 high priority projects dealing with high-speed service (*16*). EU policies also incorporate explicit goals of promoting multi-nodal (polycentric) development. European transportation policy, therefore, incorporates an intention of altering or at least promoting new forms of spatial organization. The European Spatial Development Perspective (ESDP) promotes polycentricity at the multinational scale, seeking to support development outside the dominant 'Pentagon' of North West Europe (*2*). Portuguese national policy addresses similar goals of "economic and social cohesion" but at the smaller regional scale of polycentricity.

Built into both scales of policy is an attempt to deal with inherent tension and interdependence between the global and the local: "polycentric regions are believed to eliminate the social and environmental disparities of monocentric cities and to be better equipped to contribute to global competitiveness" (*11*). The motivation for HSR development in Portugal (now suspended due to the financial crisis) originally followed this line of reasoning:

> It results at least partly from a voluntary approach from the Portuguese authorities to create a mega-region between Lisbon and Oporto that could transcend the small demographic dimension of Portuguese cities and put them in a paradigm of networked cities in order to dissociate the relations between dimension and urban functions (*18*).

When issues span larger geographic scales, policy becomes less about the give-and-take of government officials trading benefits for local constituencies. Instead, in a globalized urbanizing economy, the success of one area depends in a more immediate way than previously on the success of a project in another not necessarily spatially contiguous area. While conventional rail already operates in Portugal, it is hoped the increment in accessibility provided by HSR will support unprecedented regional integration. HSR and its potential to create discontinuous regions—single labor and commercial markets that span large distances but do not include all intermediate areas—is a paradigmatic example of a network phenomenon that demands reconsideration of cooperation and control across scales and space.

The theoretical arguments for regionalism satisfy an intuitive sense that a problem should be matched in scale and form by the tools used to address it. The mirroring of networked society by networked governance is conceptually attractive; nevertheless, the actual development of regional cooperation is by no means straightforward. Barring formal regional government, collaborative management of larger-scale planning falls under the newer concept of *governance:*

> Since at least the 1990s, a general conceptual and practical shift has emerged, away from a "classical," territory-based, hierarchical structure (i.e., "government") and towards more fluid, de-territorialised, network-based, multi-actor structures (i.e., "governance") (*19*).

As such, the incentives for and expected benefits of collaboration must outweigh transaction costs and overcome institutional barriers to cooperation. As Rayle and Zegras discovered in a study of inter-municipal collaboration in Portuguese metropolitan areas, the emergence of collaboration depends on quite a number of factors including the legal and institutional environment, prior existence of intergovernmental networks of interaction, and—most relevantly

for the case of HSR—on an external trigger "that prompts potential partners to reevaluate their situation and consider collaboration" (*19*).

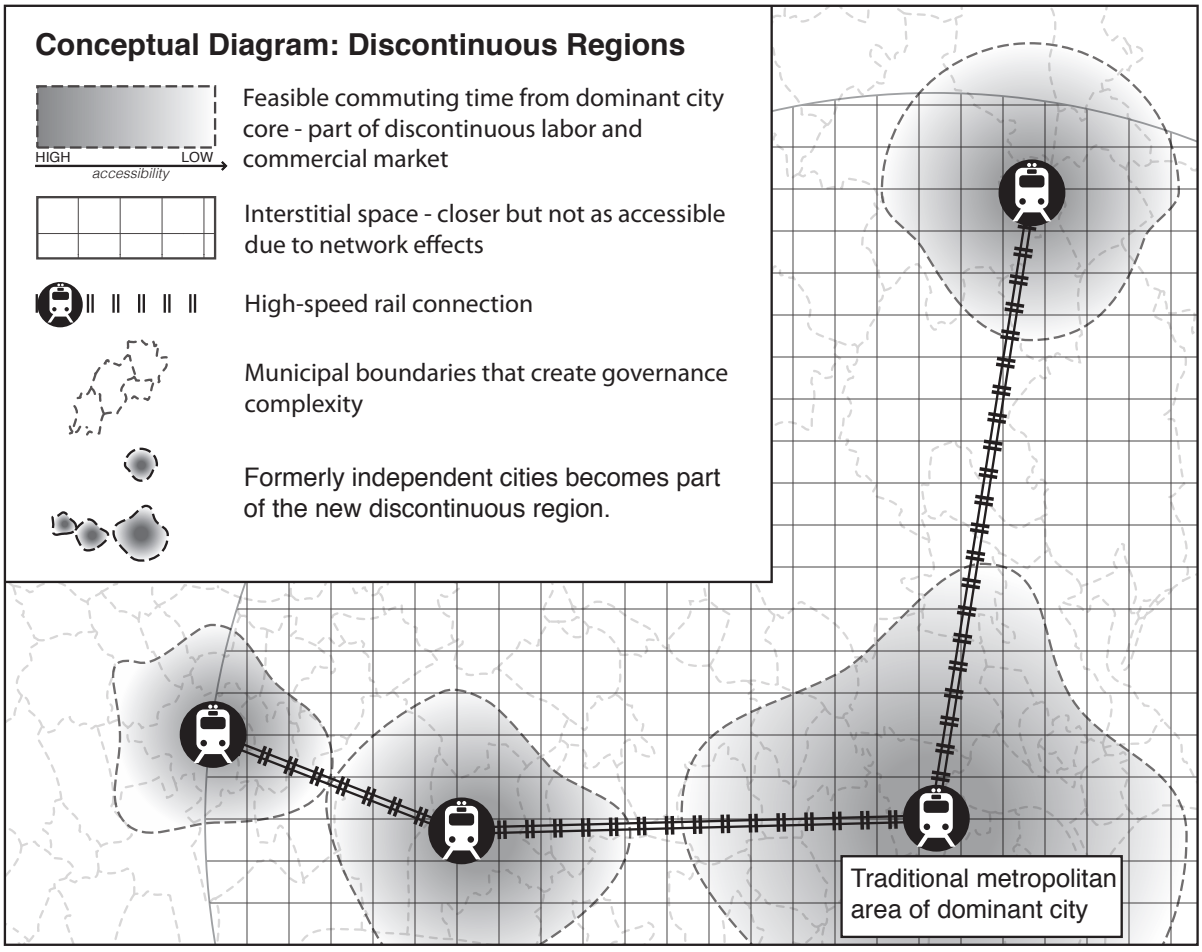

FIGURE 1 Discontinuous Region.

Rayle also discusses the importance of inter-municipal competition as a constraint on cooperation and postulates the role of higher levels of government in incentivizing cooperative action. She recommends that the central government disburse funds at the metropolitan level in order to provide a significant enough incentive to overcome the competitive "zero-sum context of metropolitan planning" (*19*).

The case studies of HSR reported in the latter part of this paper reveal a twist on the competition effect: the expected changes in accessibility (and therefore in the competitive landscape) within Portugal may actually motivate cooperation between municipalities. The threat of losing out to Lisbon is beginning to alter expected outcomes of municipal collaboration within the central region of Portugal. In the same way that at the national level Lisbon is seeking to network with its surrounding cities and so become more competitive at an international scale, Leiria and particularly Coimbra are interested in networking at the more regional scale so as to not lose out within the national (and to a more limited degree, international) arena.

Parallel to the literature detailing institutional collaboration is a body of work dealing with the benefits and challenges of stakeholder involvement in decision-making processes. "Stakeholder" refers not only to members of the public but to "any group or individual who can

affect or is affected by the achievement of the organization's objectives" (*20*). Recently, ideas of collaborative adaptive management have moved stakeholder approaches away from one-time consultation to provisions for ongoing management. The nature of rapidly changing, unstable and "increasingly networked societies," demands a conversion of planning into ongoing cycles of implementation and learning aimed not only at approaching the public interest now, but also capable of evolving to fit changes and provide management into the future (*21*). The land-use transport sector is characterized by long timelines for project development and realization of impacts. Thus, ongoing collaborative management is a particularly salient approach to the involvement of multiple levels of government. Coimbra's urbanization plan is one case of a national entity engaging with local government as an ongoing management partner critical to the success of a much larger endeavor.

PORTUGAL: INSTITUTIONAL BACKGROUND

Before investigating the specific case of HSR planning in Portugal, it is important to explain its institutional context. In Portugal there are four legally defined levels of spatial organization: sub-municipal or freguesia, municipal, regional, and national. In reality the vast majority of power is concentrated at the municipal level and national level. Regional governance encompasses a patchwork of entities beholden for power and resources either to national or local governments (*19*). In 1991, metropolitan governments were established for Lisbon and Porto. Appointed municipal representatives serve to coordinate planning activity. In 2003 this concept was expanded to enable a variety of municipal coalitions, with criteria based on population size and level of urbanization (*22*). The scope of potential local action has also increased in recent years. Under the principle of 'general competence,' local government may undertake any action for the wellbeing of its residents (*23*). Greater financial resources do not necessarily accompany this freedom but it has played a role in the diversification of public service delivery modes across municipalities in Portugal (*23*).

Portugal has also experienced significant socioeconomic restructuring since its entrance into the EU in 1986. In particular Lisbon, Portugal's dominant metropolitan region, is now part of the globalized service economy: by 1991, 70% of total employment in the Lisbon region was in the tertiary sector (*23*). Economic change is accompanied in turn by spatial and governance changes:

> There has been a shift from what was still a single centre city in the late 1960s, to a poly-nuclear metropolitan area by the beginning of the twenty-first century. The reality of an increasingly complex, diverse and rapidly developing city strongly interrelated with its broader city-region has brought increased recognition of the limitations of current governance systems and spawned the emergence, in a largely fragmented and evolutionary manner, of a range of new governance arrangements (*23*).

The case studies in the next section will be used to investigate HSR's potential to extend this process from the more traditional metropolitan scale to the scale and form of new discontinuous regions.

As is so often the case, Portugal's economic growth was unfortunately accompanied by sprawling development. The 2010 *State and Outlook* report released by the European Environment Agency (EEA), an agency of the EU, cites concerns over "Disorderly urban expansion causing fragmentation and degradation of surrounding areas (affecting quality, ecology, production and landscape potential and contributing to the depopulation and deterioration of other areas)" (*24*). This degradation, the report points out, is compounded by

"Insufficient transport intermodality, too much dependency on private vehicles and insufficient development of other transport modes such as rail" (*24*).

HSR ostensibly offers the means to develop economically without associated sprawl and auto-dependent mobility. The realization of this potential depends to a large degree on local planning and policies that support "train station-oriented development" (*25*). Municipalities in Portugal are responsible for managing a broad spectrum of local services including urban planning and public transportation (except in the Lisbon and Porto metropolitan area) (*22*). Of particular interest given the importance of access and egress to HSR stations is the structure for local provision of transit. Porto and Lisbon have their own funding structure and relationship to the central government. Elsewhere municipal governments are responsible for funding local transportation. There are no central government subsidies for municipally owned transportation services, with the exception of capital project grants. Operating subsidies from the central government are distributed exclusively to state-owned enterprises, such as the *Metro do Porto*, not to municipalities. EU Structural Funds can be applied to specific projects at a local level. These funds are, however, administered by the central government (*22*). Increasingly important inter-city bus routes are operated by private companies and licensed by IMTT, the national transportation regulator. Only ad-hoc coordination exists municipal and regional private operators (Interview, SMTUC, unpublished data).

Finally, municipalities bear the greatest responsibility for shaping development and land use. While strategic planning occurs at the national and regional scales, the Plano Director Municipal (PDM) or municipal master plan is the regulatory zoning instrument used to implement spatial strategies (*22*). No formal mechanisms exist for coordinating land use decisions and public transportation service (Interview, SMTUC, unpublished data).

PLANNING FOR HSR IN PORTUGAL: THREE CASES

The following study of three cities in Portugal; Évora, Leiria, and Coimbra; is based primarily on information collected during interviews with national and local officials in January 2012.

HSR planning in Portugal has focused primarily on two axes: one heading west connecting Lisbon and Madrid and another within the densely populated coastal region, connecting the two largest cities of Porto and Lisbon. This research focuses on three cities that could feasibly be brought within commuting distance of Lisbon by HSR investment. Évora is located on the Lisbon-Madrid axis, approximately 135 road kilometers (84 miles) from Lisbon. This city of 50,000 would be brought within a thirty-minute trip (station-to-station) of downtown Lisbon by HSR. Both Leiria and Coimbra are located along the north-south HSR axis. Coimbra is the third major city in Portugal, located 200 road kilometers (124 miles) north of Lisbon. Leiria is located 70 kilometers (43 miles) south of Coimbra. HSR would bring Leiria and Coimbra within 36 and 56 minutes of Lisbon, respectively, although time to connect actual origins and destinations would of course be greater.

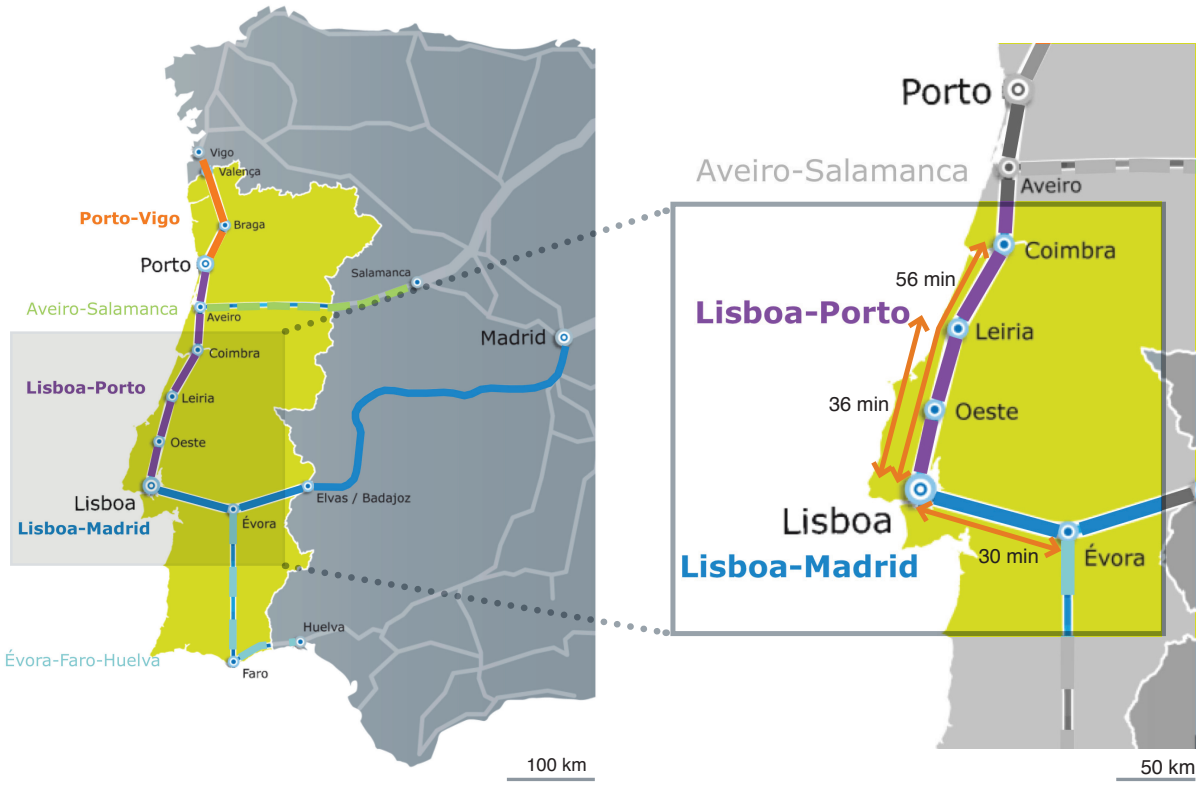

FIGURE 2 Proposed HSR network (Adapted from The Portuguese High Speed Rail Project. Presented, Rede Ferroviária de Alta Velocidade (RAVE), Moscow, April 2004).

Prior to visiting each municipality, an initial interview was conducted at the Lisbon offices of REFER, the national rail agency charged with planning HSR. Of primary interest here was to ascertain the degree of national-local interaction in the HSR planning process. As part of the formal environmental impact assessment (EIA), municipalities were provided with alternatives for comment. A primary issue at this stage is station location. Not only does a station's proximity to a city's activity center affect the degree of connectivity into the local urban economy, it also—because of expectations about the level of impact—affects the degree to which municipalities feel they should engage in the national HSR planning process. Évora was only presented with one possible station location in the EIA, with various alignment differences considered. For Leiria, sites to the east and the west of the city were analyzed, with the western site ultimately selected. In Coimbra, by contrast, the initial pre-EIA proposals located the station significantly outside the city. Political pressure altered the proposed location to a site north of the city's two conventional rail stations, in a relatively underdeveloped area. In all cases, national policy priorities dictated that stations should have some connection to the conventional rail system.

Also affecting the level of impact expected by each municipality is the increment in accessibility resulting from planned HSR. Évora is at present served by four trains per weekday in each direction with a travel time of 1 hour and 58 minutes (*27*). The planned frequency for HSR would be 12 trains per day and 30-minute travel times (Lopes, unpublished data). The primary conventional rail Norte line does not currently serve Leiria. Accessibility by rail is very low, with five trains per day from Lisbon, only two of which do not require transfers, and all of

which are slowed by the frequency of intermediate stops. Bus and private automobile are the primary means of access to Lisbon from Leiria.

Coimbra, as one of Portugal's major cities, important for both its educational institutions and cultural history, is currently served quite well by the rail system. With more than hourly frequency between Lisbon and Coimbra for most of the day, along with the higher speed "Alfa Pendular" tilting-train service, rail is already a competitive option for travel between Coimbra and Lisbon, although as in all of Portugal the competition from the private automobile has increased. The proposed HSR would reduce travel times from 2h05 for intercity service (Intercidades) or 1h51 for the Alfa Pendular to just under an hour (*27*), pushing service under the threshold for reasonable daily commuting times.

The three sets of interviews with local government officials and planning staff in these cities revealed shared conceptions of how HSR can change regional identities and the demands placed on urban governance. These are discussed in detail below.

HSR Commuting and Social Impacts

Beginning with the effects of HSR on the urban experience, city officials in both Évora and Coimbra independently mentioned new modes of commuting that might emerge or be augmented by the provision of HSR service. In Évora, teaching faculty and senior management professionals were proposed as demographics that might live in Évora and commute to Lisbon for part of the week (or vice versa). According to Arq. Pereira (unpublished data), it is not uncommon for faculty to teach at multiple institutions and therefore have multi-destination commutes. Similarly, senior management professionals with multiple business locations and/or the flexibility to work from home might use HSR to commute part-time. The planning officials in Évora emphasized the city's quality of life as an asset that might attract people who wish to live in the city and commute into Lisbon. Évora is located in what could be characterized as an idyllic agricultural setting and is famous for its historic city center. The city planners, while excited about HSR, are apprehensive about the social effects of potentially dramatic population change. The city feels strongly about maintaining the strength of its core and for this reason has already turned down one proposal for a new service-industry development in the vicinity of the station, 9km from the city center. The projects as they saw it would have become an independent entity and thus deliver primarily external benefits. This choice brings the development challenges of a non-central station into focus.

The perspective on commuting was similar in Coimbra: Because of the University and various health institutions, the city boasts considerable intellectual capital. Unfortunately, much of that knowledge base is lost once students complete their education. Coimbra's greatest expectation with respect to the HSR project and the associated urbanization plan (discussed below) is to retain its knowledge base. At present, people relocate to Lisbon or Porto to find jobs. The city officials want to increase housing supply and develop Coimbra as a residential base for commuting outward. One desirable model would be to have people live in Coimbra and then work a few days a week elsewhere and a few days in the city. This model is most applicable to a specific socioeconomic class (academic, health) that lends itself to part-time commuting. The reasoning, according to city officials, is that Coimbra can provide a more relaxed residential environment (than Lisbon or Porto) while still maintaining easy access by train to the cultural and social aspects of the bigger cities (Interview, Coimbra, unpublished data).

The idea of commuting for part of the week or to multiple destinations is consistent with other research: A recent report cites the fact that "many workers are not required to appear in one office five days a week" as one of the major drivers of increases in super-commuting (*28*). Similarly, the POLYNET study, published in 2006 and aimed at defining more closely the concept of polycentricity, revealed the importance of intraregional mobility to the extent that for some professionals, "the nature of their work may make a regular daily commuting pattern impossible" (*2*).

The difference between "super-commuting" or even longer distance business travel by other modes and regional HSR is that HSR commuting would no longer necessarily refer to the tail-end of the distribution of willingness to travel, but rather (assuming adequate station accessibility, a significant assumption) to a set of travel times within the normal range of commuting behavior, even if distances are in the range of "super-commuting". It is therefore important when thinking about HSR and its effects on labor-market definition to consider the potential for associated social change. Not all people are equally likely to commute via HSR or to relocate to smaller connected cities. Demand studies are important not only to predict the use of the transport service, but also to understand the much broader socioeconomic changes that might come with an altered metropolitan region (*29*).

The rearrangement of spatial and economic relationships within a region, while influenced by contemporary forces of globalization and supported by new infrastructure like HSR, nevertheless does not begin with a tabula rasa. New functional networks are overlaid onto an existing urban landscape (*17*). As a result, cities may develop dual identities, simultaneously existing in relative self-sufficiency, with a given labor market structure and socioeconomic base, and as networked entities within a new "discontinuous region." Ciudad Real in Spain, for example, now combines the characteristics of an isolated small city and of a suburban district. Located 112 miles from Madrid and linked via a 51 minute HSR trip as of 1992, this relatively small city (population 65,703 in 2003) has some of the best-documented small-city-to-large-metropolis commuting via high-speed rail (*29*).

More notable than the existence of commuting itself is the social differentiation of the "Avelinos," as they are called—from AVE, Alta Velocidad Española. A survey conducted by Garmendia et al. found that households that choose to locate close to the Ciudad Real HSR station tend to be owners rather than renters and are more likely to have children than the city average. They attribute this to expanded metropolitan-level location choices; people interested in the Madrid labor market but in less permanent family situations would be more likely to rent and therefore could be accommodated within the contiguous metropolitan area. Families, on the other hand, chose to relocate so that they can afford more space. The survey also revealed that 39% of daily commuters to Madrid were born outside the province of Ciudad Real (*29*). "Avelinos," the new class of HSR commuters, possess partially distinct socio-demographics from the prior city population.

In the longer-run, these kinds of changes may have implications for social relations and for the demand profile for public services imposed on a local government. Prior to deployment, the HSR planning process should incorporate awareness of possible social implications and raise questions at the local level about whom the HSR investment is intended to serve. Is it most important to consider convenience factors (e.g. multimodal coordination) that cater to multi-destination business travel? Or perhaps, as officials in Évora and Coimbra hinted at, the points of influence are those that address "residential environment" choice to cater to more diverse and mobile households (*17*). In reality, the market for all large-scale infrastructure can (and should)

reach across groups. Nevertheless, asking user-oriented questions can guide decisions at the municipal scale and begin to address what it means, in terms of local decisions and everyday experience, to be integrated into a discontinuous region.

Governance and Coordination

Next, the municipal interviews in Coimbra and Leiria, along with interviews at REFER, revealed changing views of intergovernmental relationships and the need for coordination. Évora, because of its external proposed station location and relative isolation from neighboring population centers, has less inducement to consider cooperative governance in response to HSR. Coimbra provides an example case in which a national agency (REFER) views a local entity as an indispensible partner in the development of a large-scale system. As discussed earlier, the economic benefits of HSR depend very much on local development. Moreover, land use planning requires a long timeline and ongoing management. For this reason, REFER and the municipality of Coimbra have entered a formal cooperative protocol. Together they are managing a 100-hectare (247 acre) urbanization plan to develop the HSR station area into a new city gateway.

Under this plan, HSR is but one piece of a multimodal hub and new urbanization area that will serve both the city and the region. The Coimbra housing market is high-priced; the presence of high-income professions (doctors, nurses, teachers, engineers, upper-level state employees) along with a sizeable student population—the majority of whom are from outside the city—pushes prices up for the existing supply of housing (Interview, REFER, unpublished data) and thus contributes to the development potential of the station area. Involvement of REFER in local planning was actually a way to reduce transaction costs: the overall project will still need to get approval from all involved parties but REFER offers extra management and financial resources to speed up the overall planning process (Azevado, unpublished data).

The most interesting aspect of this national-local cooperation is that it shows evidence of creating spillover effects beyond the single-issue of HSR. Under the current financial situation, there are three possible scenarios for the urban plan and station in Coimbra:

1) A national HSR public-private partnership (PPP) goes forward as initially planned by REFER with the Coimbra station plan embedded in it.
2) An HSR PPP goes forward but the station is not included and is instead built as a separate project under REFER's full control. This approach would make detailed collaboration between REFER and Coimbra easier.
3) *No HSR PPP materializes. Planning of the station and development of the urban plan continues until funding can be procured. The HSR aspects are left out of the intermodal station (tracks, escalators, etc.) but without precluding their future addition.*

Although the HSR project in Portugal has been suspended, the urbanization plan in Coimbra is ongoing and considered important enough to continue (at least in planning) regardless of the HSR situation. Nevertheless, there are constraints associated with complex multi-scale planning processes. Many years of anticipation of a new station for Coimbra have preempted more incremental improvements to the existing rail stations.

In addition to the entry of a national agency into a local planning process that extends beyond the single issue of HSR, representatives from both Leiria and Coimbra cited HSR as a reason to reconsider institutional relationships within the central region of Portugal. In both cases the double-edged sword of increased accessibility via HSR is motivating changing attitudes. While shorter travel times from Lisbon mean that Coimbra and Leiria might attract more visitors,

the compressed trip time also runs the risk of eliminating overnight stays. City officials in Coimbra and Leiria recognize that their cities' competitiveness within the tourism and business tourism industry depends on their ability to be part of multi-day multi-destination trips.

In Leiria the opening of a new highway connecting to Fatimah, a major pilgrimage site, and the possibility of HSR connectivity are reasons, according to city planners, that Leiria might rethink its currently competitive relationship with Fatimah. Similarly Coimbra is considering a shift away from regional competition to a more cooperative approach. A regional association of tourism was previously established but Coimbra chose not to become a member. The organization was established by the central government and from Coimbra's point of view was too large, had inappropriate sub-regions, and did not pay adequate attention to Coimbra. Objecting to the headquarters' location in Aveiro, the city refused to participate and created its own authority. Now, while there are still two authorities, the relationship between them is more relaxed. The current municipal government understands that collaboration is needed and that they have to be able to market the whole region, not just the city, in order to compete (Interviews, Coimbra and Leiria 2012).

Coimbra and Leiria are additionally reconsidering regional mobility planning in response to the external catalyst of HSR. Leiria and the adjacent community of Marinha Grande are 10-12 minutes apart by car and interact extensively, effectively sharing their labor market. The municipalities have for many years discussed an inter-municipal transportation plan. The planning staff in Leiria views HSR as the sort of catalyst that might push the municipalities past the transaction costs/expected benefits threshold towards cooperation. Coimbra is eager to have a regional transport authority to define rules and coordinate both public and private transport operators. Current trends of suburbanization and increased inter-city commuting within the region around Coimbra mean that the city is already struggling with inadequate regional mobility planning (Interview, SMTUC, unpublished data). The introduction of HSR would magnify this existing gap. The proposal for a regional transport authority is included in the city's formal strategic plan document, as the creation of such a body would depend on the central government for definition and authorization.

CONCLUSIONS AND FUTURE WORK

Returning to Lynch and the question of institutional innovations causing secondary effects, there is much yet to study in the relationship between HSR, discontinuous regions, and governance. As we have seen, HSR can serve as a catalyst for governments to rethink regional identity, intergovernmental relationships, and competitive positioning. From an intentional policy perspective, however, our understanding must develop beyond the descriptive relationship posited thus far: transport changes regional form and form can change attitudes towards governance, which can in turn continue to redefine the spatial and functional organization of a region. For these reorganizations to happen in any intentional manner, more clearly defined expectations, across scales of government, are needed at the outset.

Practice-oriented analysis must recognize that if new functional systems result from HSR investment, these will necessarily be overlaid on existing spatial, governmental, and economic configurations of cities and towns. Because of the global importance of information-based network economies, there is a temptation to focus on purely functional definitions of regions, in terms of flows of people and information. Nevertheless, the morphology of urbanized space still matters. Environmentally, the interstitial spaces of discontinuous regions have the potential to be

subjects of spatial planning aimed at preserving biodiversity through the avoidance of habitat fragmentation and the preservation of natural systems (watersheds, for example) (*30*). Without policy aimed at compact development, the environmental good of discontinuous regions is by no means guaranteed. From the perspective of government, space matters because it is the unit of control. Functional relationships that define economic networks or labor markets are inherently fluid and semi-de-territorialized; one cannot simply define a higher level of government to make more "optimal decisions" because the scale and boundaries of the functional economic unit are not fixed. Moreover, economic networks are layered and differentiated across sectors and across scales. One city may simultaneously exist within regional and international networks and each role may possess a degree of mutual independence (*2*). Thus, *governance* and the creation of relationships between units and levels of *government* remains a necessity. In order for cooperation to emerge, each government entity needs to more fully understand their expected outcomes in order to seek common ground.

In some ways HSR is unique: it enables a continuity of daily lived-experience across geographic distances which are greater than those that could be integrated by the automobile or conventional rail, in effect creating social and economic relationships within discontinuous regions. This discontinuity could enable intentional preservation of the interstitial spaces between urbanized areas. Moreover, HSR can create a higher degree of interdependence between the areas it serves and thus increase the importance of local policy to the realization of regional and national objectives. In other ways, the magnitude of HSR as an environmental change simply highlights existing trends (sprawling land use patterns, increased inter-city commuting) and magnifies already relevant gaps in the Portuguese planning process: the challenges of coordinating inter-city transport with intra-city service or the inadequate connections between spatial and mobility planning.

To clarify goals and expected outcomes for HSR at each level of government will require further refinement of theory: What is the nature of relationships between cities within a region connected by HSR, along the spectrum from hierarchy to equality? The results of the POLYNET study state unequivocally that dominant cities still matter and have a unique role to play as gateways into the global economy (*2*). If that is so, what does it mean for how secondary cities like Évora, Leiria, and Coimbra establish goals for HSR or define their relationship to Lisbon? Good work exists describing the underlying causality of dispersion and clustering, including investigations into labor specialization and the fact that negative externalities (pollution, congestion) seem to be more spatially localized than positives ones (knowledge spillovers, labor pooling, etc.) (*31*). Further work is needed to translate these more descriptive arguments into actionable approaches for national and, in particular, local governments. Moreover, the utility of such furthered understanding would extend beyond Europe—although admittedly that has been the focus here. As Ross and Woo point out, "among the most important issues in HSR planning" for the US is "integrated cooperative governance, which is particularly significant under the fragmented political system in the U.S." (*3*).

Successful HSR deployment demands a toolkit of policy and design aimed at extracting the most economic, social, and environmental benefit from a project, accompanied by an appropriate structure for management and intergovernmental cooperation. Such a toolkit will be derived both from fundamental theory about functional relationships and spatial organization and from a commitment to grappling with the constraints and complexity of multi-actor multi-objective governance systems. Only then will HSR become a mechanism for intentionally and positively influencing the development of our urban regions.

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- Luis Santos and Ricardo Grade, SMTUC, Coimbra, November 2, 2012.

WORKS CITED

1 Lynch, K. *What Time is this Place?* The MIT Press, London, 1972, pp. 215-223.

2 Hall, P. and K. Pain. The *Polycentric Metropolis: Learning from Mega-City Regions in Europe*. Earthscan, London, 2006, pp. 3, 13, 110-112, 118-121, 197-211.

3 Ross, C. L. and M. Woo. The Identification and Assessment of Potential High-Speed Rail (HSR) Routes from a Megaregion Perspective. In *Transportation Research Record: Journal of the Transportation Research Board,* Transportation Planning 2012, Transportation Research Board of the National Academies, Washington, D.C., 2003, pp 3.

4 Glaeser, E. Are Cities Dying? *The Journal of Economic Perspectives*, Vol. 12, No. 2, 1998, pp. 139-160.

5 Menéndez, J. M., et al. New high-speed rail lines and small cities: locating the station. *The Sustainable City II: Urban Regeneration and Sustainability*. Editors, C.A. Brebbia, J.F. Martin-Duque, and L.C. Wadhwa, 2002.

6 Nichols, M. Planning High Speed Rail Stations for Sustainable Urban Development: European Case Studies. *The German Marshall Fund Policy Brief*, February 2011, pp 1-7. http://www.gmfus.org/archives/planning-high-speed-rail-stations-for-sustainable-urban-development-european-case-studies/. Accessed July 4, 2012.

7 Muller, P. O. Transportation and Urban Form: Stages in the Spatial Evolution of the American Metropolis. Chapter 3, *The Geography of Urban Transportation*, 3rd edition, pp. 59-85. Editor S. Hanson. New York, Guildford Press, 2004.

8 Schafer, A. Regularities in Travel Demand: An International Perspective. *Journal of Transportation and Statistics*, 2000, pp. 1-31.

9 Richardson, H.W. *The New Urban Economics: and Alternatives*. Taylor and Francis, Inc., 2007, pp. 7-30.

10 Forkenbrock, D.J. Transportation Investments and Urban Form. In *Transportation Research Record: Journal of the Transportation Research Board,* No. 1805, Transportation Research Board of the National Academies, Washington, D.C., 2003, pp 153.

11 Ross, C. L. and M. Woo. Megaregions and Mobility. *The Bridge on Urban Sustainability*, Vol. 4, No. 1, 2011.

12 Wheaton, W. C. and D. DiPasquale. Local Governments, Property Taxes, and Real Estate Markets. *Urban Economics and Real Estate Markets*. Prentice-Hall, 1996, pp. 319-337.

611 *13* Cortright, J. *Driven Apart: How Sprawl is Lengthening Our Commutes and Why Misleading*
612 *Mobility Measures and Making Things Worse*. CEOs for Cities, 2010.
613 http://documents.scribd.com.s3.amazonaws.com/docs/3mea0rxg001huf45.pdf?t=133305
614 0406. Accessed July 4, 2012.
615 *14* Metcalf, G. Regional Planning Without Regional Government. *SPUR Newsletter,* July 2004, pp.
616 1-2.
617 *15* National ITS Architecture. http://www.iteris.com/itsarch/. Accessed 23 July 2012.
618 *16* Trans-European Transport Network: TEN-T Priority Axes and Projects 2005. European
619 Commission, 2005. http://ec.europa.eu/transport/infrastructure/maps/doc/ten-
620 t_pp_axes_projects_2005.pdf. Accessed 6 July 2012.
621 *17* Kloosterman, R.C. and S. Musterd. The Polycentric Urban Region: Towards a Research Agenda.
622 *Urban Studies*, Vol. 38, No. 4, 2001, pp. 623-633.
623 *18* Pagliara, F., J. Abreu e Silva, J. Sussman, and N. Stein. Megacities and High Speed Rail
624 systems: which comes first? Presented at the mobil.TUM 2012 - International Scientific
625 Conference on Mobility and Transport, Munich, Germany, 2012.
626 *19* Rayle, L. and Zegras, C. The emergence of inter-municipal collaboration: Evidence from
627 metropolitan planning in Portugal. *European Planning Studies,* accepted 18 July 2011,
628 forthcoming.
629 *20* Mitchell, R.K., B.R. Agle, and D.J. Wood. Toward a theory of stakeholder identification and
630 salience: Defining the principle of who and what really counts. *The Academy of Management*
631 *Review*, Vol. 22, No. 4, 1997, pp. 854.
632 *21* Innes, J. and D. Booher. Consensus Building and Complex Adaptive Systems – A Framework
633 for Evaluating Collaborative Planning. *APA Journal*, Vol 65, No. 4, 1999, pp. 412-423.
634 *22* Nelson, J. S. The Portuguese Surface Transportation Policy and Finance System: Current
635 Status. *MIT Portugal Program Working Paper Series*, 2008.
636 *23* Silva, C.N. and S. Syrett. Governing Lisbon: Evolving Forms of City Governance. *International*
637 *Journal of Urban and Regional Research*, Vol. 30, No. 1, 2006, pp. 98–119.
638 *24* Land use (Portugal). *SOER 2010: The European environment – state and outlook 2010*.
639 European Environment Agency, November 2010.
640 http://www.eea.europa.eu/soer/countries/pt/soertopic_view?topic=land. Accessed 6 July
641 2012.
642 *25* Peters, D. and J. Novy. Train Station Area Development Mega-Projects in Europe: Towards a
643 Typology. *Railway Station Mega-Projects and the Re-Making of Inner Cities in Europe. Built*
644 *Environment*, Vol. 38, No. 1, 2012.
645 *26* The Portuguese High Speed Rail Project. Presented, Rede Ferroviária de Alta Velocidade
646 (RAVE), Moscow, April 2004.
647 *27* CP Timetables. http://www.cp.pt/ Accessed February 2012.
648 *28* Moss, M. L. and C. Qing. The Emergence of the "Super-Commuter." *Rudin Center for*
649 *Transportation*. New York University Wagner School of Public Service, 2012.
650 *29* Garmendia, et al. Urban Residential Development in Isolated Small Cities That Are Partially
651 Integrated in Metropolitan Areas By High Speed Train. *European Urban and Regional*
652 *Studies*, Vol. 15, 2008, pp. 249-264.
653 *30* Beatley, T. Preserving biodiversity. *American Planning Association. Journal of the American*
654 *Planning Association,* Vol 66, No. 1, 2006, pp. 5-20.
655 *31* Meijers, E.J. and M.J. Burger. Urban Spatial Structure and Labor Productivity in U.S.
656 Metropolitan Areas. Presented at the Regional Studies Association annual conference
657 'Understanding and Shaping Regions: Spatial, Social and Economic Futures', Leuven,
658 Belgium, 2009.