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A Comparative Analysis of High-Speed Rail Station Development into Destination and Multi-Use Facilities: The Case of San Jose Diridon

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A Comparative Analysis of High-Speed Rail Station Development into Destination and Multi-Use Facilities: The Case of San Jose Diridon

MTI Report 12-75

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REPORT 12-75

A COMPARATIVE ANALYSIS OF HIGH-SPEED RAIL STATION DEVELOPMENT INTO DESTINATION AND MULTI-USE FACILITIES: THE CASE OF SAN JOSE DIRIDON

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16. Abstract

As a burgeoning literature on high-speed rail development indicates, good station-area planning is a very important prerequisite for the eventual successful operation of a high-speed rail station; it can also trigger opportunities for economic development in the station area and the station-city. At the same time, "on the ground" experiences from international examples of high-speed rail stations can provide valuable lessons for the California high-speed rail system in general, and the San Jose Diridon station in particular. This study identifies and draws lessons from European HSR stations that share similarities across several criteria with the San Jose area context. From an initial consideration of twenty European HSR stations, the researchers chose five stations for in depth case studies: Euralille and Lyon Part Dieu in France, Rotterdam Centraal and Utrecht Centraal in the Netherlands, and Torino Porta Susa in Italy. Additionally, the study drew information from relevant local actors and stakeholders to better tailor recommendations to the particular California context.Through the undertaking of different research tasks–literature review, case studies of European railway stations, survey of existing station plans and other planning documents for the Diridon station, station area analysis, and interviews with station area planners and designers–the study compiles timely recommendations for the successful planning of the Diridon station and other stations along the California high-speed rail corridor.

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EXECUTIVE SUMMARY

As both scholarly literature and experience on the ground indicates, good station-area planning is a very important prerequisite for the eventual successful operation of a high-speed rail ("HSR") station; it can also trigger opportunities for economic development in the station area and the station-city. What is less clear, however, is what constitutes good station-area planning.

This study seeks to: 1) understand the elements of good station-area planning for high-speed rail stations; 2) document what experts consider as challenges, opportunities and prerequisites for good station-area planning around the San Jose Diridon station; 3) document how station-area planning took place in five case studies of successful European HSR stations; and 4) extract lessons and recommendations for the Diridon station from the literature, local and European experts, and the five case studies.

This study began with a literature review on the planning and design of successful intermodal transit facilities. From this review, the authors determined three types of elements important to good station-area planning: 1) elements relating to station and station-area design and land uses; 2) elements relating to the operation of transportation services; and 3) planning and policy actions relating to station-area planning. Additionally, the authors undertook an evaluation of the Diridon station-area plans, and other related planning documents and reports, detailing the evolution of goals, vision, and challenges for station-area development. This textual review was complemented by visits to San Jose Diridon and interviews with San Jose planners and urban designers involved in the Diridon station-area planning. To better understand and extract lessons from the European experience of station-area development, the authors initially developed twenty profiles of stations in Germany, Austria, Spain, France, Belgium, Italy, and the Netherlands, and with the help of the study's advisory board, selected from them five case studies for detailed exploration. The case studies included the high-speed rail stations in Lille and Lyon, France; Utrecht and Rotterdam, the Netherlands; and, Turin, Italy. For the case studies, the authors reviewed relevant plans and other documents, and interviewed project managers.

Drawing from these multiple information sources, the authors reached the following attributes characterizing successful HSR station-area planning:

- Strong spatial connectivity, which we define as, "seamless integration of the station with its surroundings."

- Strong intermodal connectivity, which we define as, "the seamless integration of different transportation modes at the station, and a convenient access and transition from one mode to the other."

- Strong operational connectivity, which we define as, "good project governance, and coordination and collaboration among different public sector agencies and between the public and private sectors."

Drawing from the different sources of information collected for this study, the authors suggest a series of recommendations for Diridon's station-area development.

To enhance spatial connectivity:

- The passenger flows from one station area to the other should provide easy access to station platforms; passengers should be able to easily walk from one platform to the other.
- Attention should be given to the placement of station entrances, so that they are well-accessed by the surrounding street network.
- Particular emphasis should be given to the pedestrian connections.
- Wayfinding strategies and good signage should help passengers navigate through the station and get information about destinations outside the station.
- Station design should consider the creation of both outdoor and indoor communal spaces–such as an outdoor plaza and an indoor grand station lobby.
- Station design should incorporate and aesthetically integrate the existing historic station, but also expand significantly the station's space and facilities. It should avoid creating a "good/front" and a "bad/back" building side.
- Architectural design should consider how to bring ample natural light to the station's interior.
- If an aerial configuration is chosen, special care should be taken to make the elevated structure appear lighter and less bulky.
- The station should have a good provision of retail, entertainment, and cultural services, similar to many successful European stations.
- The station should have ample provision of traveler services–ticketing and information booths, storage space, waiting spaces, etc.
- The likely cancellation of the ballpark development offers the opportunity for mixed-use development and housing, activating the station-area 24/7, but it is also important to plan for land uses that can accommodate office/commercial and entertainment activities, and help concentrate jobs near Diridon station.
- Parking facilities should be distributed to the surrounding neighborhoods. In particular, shared-use parking with the Mineta International Airport and "parking benefit districts" in the neighborhoods surrounding the station should be considered.

To enhance intermodal connectivity, the City of San Jose should consider:

- Free shuttle connections to and from the Mineta International Airport.
- Location of a bus terminal in close proximity to the station.

- Expansion of bicycle-share and bicycle parking facilities.
- Utilization of the Mineta airport's car rental services.
- Seamless transfer of luggage from the airport to the station, and vice versa.
- Integrated ticketing among the different transit operators.
- Digital panels at the station with real-time information about the arrival and departure of rail services.
- Modest-size kiss-and-ride lots and distribution of parking in surrounding areas, including at the airport, as already noted previously.

Lastly, the following actions should help enhance operational connectivity:

- Coordination of activities of the different public and transit agencies and other stakeholders. This is already happening through Diridon's Joint Policy Advisory Board.
- Development of a Joint Powers Authority to manage the station development project with representatives from different agencies on its board of directors, who have executive, and not only advisory power.
- Consideration of different finance strategies for station-area improvements.
- Encouragement of public-private partnerships and joint development projects.
- A phased planning and development process, allowing more flexibility and responding better to changing real estate markets and transportation system changes.

I. INTRODUCTION

Good station-area planning is a very important prerequisite for the eventual successful operation of a high-speed rail (HSR) station; it can also trigger opportunities for economic development in the station area, and the station-city. Examples from European HSR stations have shown that planning is instrumental in coordinating land uses around them, often through densification and the location of major "traffic attractors," such as important public buildings and distinctive station architecture.[1] At the same time, the best European examples are distinguished by a seamless integration of the HSR station, with its surroundings and a strong intermodal connectivity that seamlessly links the high-speed services to other transportation modes and services.[2,3]

Successful international examples of HSR stations can provide valuable lessons for the California HSR system, in general, and the San Jose Diridon station, in particular. The study that follows identifies and draws lessons from European HSR stations sharing similarities across several criteria, with the San Jose area context. From an initial consideration of twenty European HSR stations, the researchers chose five stations for in-depth case studies: Euralille and Lyon Part Dieu in France, Rotterdam Centraal and Utrecht Centraal in the Netherlands, and Torino Porta Susa in Italy. Additionally, the study drew information from knowledgeable local stakeholders to better tailor recommendations to the particular San Jose context. By undertaking different research tasks—literature review, existing station plans surveyed, and other planning documents for the Diridon station, interviews with station-area planners and designers, and case studies of European railway stations–the study compiles recommendations for the planning of Diridon, and other stations along the California HSR corridor.

DIRIDON STATION AND STATION-AREA PLANNING

In July 2014, the City of San Jose ("City") adopted the Diridon Station Area Plan ("Plan"),[4,5] setting out a 30-year vision for Diridon station-area planning; Diridon is likely to undergo significant transformations in the next decades due to the planned arrival of HSR and Bay Area Rapid Transit (BART) services, and the electrification of Caltrain–the region's commuter-rail system. Together, with many additional planning documents released by the City, the California High-Speed Rail Authority (CHSRA), Caltrain and other state and federal planning agencies, the Plan documents a significant planning effort creating a unique multi-modal facility, surrounded by new, state-of-the-art development. Nevertheless, given the uncertainty of future infrastructure and policy development, the Plan needs to be flexible and open to multiple adjustments.

CHSRA is currently undertaking environmental review for the San Francisco-San Jose corridor, required by the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), with the intent of issuing a final environmental document by the end of 2017.[6] As part of this review process, the alignment and vertical profile for HSR through the Diridon Station Plan Area continues refinement. Major design questions, such as the decision of whether the approach to and/or the station itself would be aerial, surface, or tunnel, have not been resolved.

Another major element in the station-area planning process is the extension of BART services to San Jose, and the development of an underground BART stop at the Diridon station. The ultimate co-location at the Diridon station of HSR, Caltrain and BART services, in combination with local bus lines and Downtown Area Short Hop (DASH) services, the recent addition of bike sharing services, and the proximity of the station to the Mineta International Airport, promise to elevate the station as one of the state's premier transit hubs. At the same time, the availability of significant chunks of undeveloped or underdeveloped land around Diridon station, mostly in the form of surface parking lots owned by public entities, offers the potential for important densification of development in the station-area.

But as will be detailed in Chapter 3, planning and development of the Diridon station and its adjacent area also have some challenges. Physical/spatial challenges include how to compress the efficient co-location and integration of different railway services in the same limited station area, and how to avoid the barrier effect between the station–especially if this is an aerial structure, and its adjacent area. Some challenges are perceptual: how to change residents' minds the private car is the best mode of transportation; how to reduce the City's car dependency, and instead, strengthen the pedestrian, bicycle and transit access to the station; how to change the private sector's belief that all this parking is necessary around the station; and how to attract developers to invest in the area, and sharing the cost of its improvements. Lastly, some challenges are financial: how to identify funding for important public structures, such as high-quality station architecture and non-revenue producing public amenities, such as plazas and public spaces.

Such challenges, notwithstanding, are not new to HSR station-area development; some European countries have over 30 years of experience with planning and designing HSR stations. While HSR has not had universally transformative impacts in all station-cities,[7] through good and bad examples, we now possess an accumulated knowledge, and can extract lessons for good station-area planning and development.

STUDY AIM AND RESEARCH QUESTIONS

The principal aim of this study is, therefore, to review existing literature and data on international multi-modal HSR stations, drawing lessons and best practices from selected case studies of European railway stations and interviews with European and United States experts, in order to inform the development of proposed California HSR stations, and in particular, Diridon Station in San Jose. The study seeks to answer some key questions related to both the transport node and the place functions of a future Diridon Station, integrating not only HSR, BART, and Caltrain services, but also non-vehicular transportation modes, such as walking and bicycling. Research for this study centered on the following questions:

- What and how can San Jose Diridon Station learn from key European rail stations built adjacent to major commercial, office, and residential uses? What types of uses are the most-compatible with HSR service?

- What and how can San Jose Diridon Station learn from key European rail station-area planning and operations processes dating back fifteen to twenty years?

RESEARCH METHODOLOGY

The study began with background research and a systematic review of the planning, transportation engineering, architecture, and public policy literature about the planning and design of successful intermodal railway facilities. A flourishing body of new literature focuses on the operations and dynamics of HSR stations in different parts of the world.[8-18] This study drew from referenced literature to examine various issues, such as HSR station design and layout, inter-modality, station access, wayfinding, parking, car- and bike-sharing, ticketing, passenger services, etc.

Next, the researchers developed a list of key comparative criteria of European cities/ stations sharing certain similarities to San Jose in size, location, and/or station-area plan and scope. The authors compiled a 'long list' of twenty possible case studies, preparing a short overview for each station on this list (see Appendix A). With the help of the study's advisory board, five 'best fit' comparisons were selected for detailed case studies, in order to identify lessons from the retrofit and current operation of facilities at San Jose Diridon. Many of the comparison stations have been operational for more than a decade, allowing for enough hindsight for evaluation. Equally important to finding out what has worked well, is to learn from what has gone wrong: How did plans have to be adjusted? Which goals did not come to fruition, and why? How well have long-term visions weathered changing conditions, volatile real estate environments, and changing political climates? To gather information for these case studies, the authors not only relied on secondary sources, but also interviewed planners and transit managers at these stations.

Additionally, the authors undertook an extensive evaluation of Diridon station-area plans, environmental impact reports (EIRs), and other planning documents detailing the goals, vision, and anticipated challenges for the development of the Diridon HSR station and its vicinity. This review and analysis of plans and texts was complemented by: 1) visits to San Jose Diridon to evaluate the area's urban form characteristics, surrounding land uses, spatial connectivity, available parking, and intermodal connections including walkability and bikeability; and, 2) interviews with San Jose planners and urban designers involved in the Diridon station area planning. The purpose of these efforts was to better understand current capacities, operations, visions, and challenges for the Diridon station.

The findings from the literature review, European case studies, site analysis and interviews with local and international professionals were compiled to identify lessons and best practices, and, ultimately, recommendations for the planning and design of the Diridon HSR station. While the immediate focus for this study is Diridon station, many of the recommendations should be applicable to other stations on the California HSR corridor.

REPORT LAYOUT

Following this introductory chapter, Chapter 2 examines the relevant scholarly and professional sources that evaluate the planning and design of successful intermodal railway stations, identifying the forces driving HSR station-area development, as well as, typical challenges related to station-area planning. Chapter 3 focuses on the Diridon station, and presents a review of all relevant plans and other planning documents to better

understand the characteristics, planning vision, perceived challenges, and opportunities for station-area development at this station. This chapter also summarizes interviews and discussions with key actors involved in station-area planning and design for the Diridon station. Chapter 4 turns the attention to European HSR stations; it first discusses some key comparative criteria used to identify relevant case studies and 'best fit' comparisons for San Jose Diridon, then proceeds to discuss in detail the five case study stations, extracting lessons from their planning and development. The concluding Chapter 5 summarizes lessons learned, and offers specific recommendations on how to enhance the spatial, intermodal, and operational connectivity at San Jose Diridon and other California stations.

II. LITERATURE REVIEW

Throughout the late nineteenth and early twentieth centuries, railway stations represented paradigmatic civic projects in European and American cities. Grand and spectacular transportation hubs–such as Union Station in Los Angeles, St. Pancras in London, Atocha in Madrid, or Leipzig Main Station in Germany–were the main gateways to their respective cities and "urban symbols of society on the move, change, and growth."[19] However, after World War II, as the vast majority of surface travel started taking place in private automobiles, railway stations and surrounding districts lost their lure and significance as important elements of a city's urban form. With drastic decreases in railway ridership and increases in the numbers of people leaving central cities–where most of these stations were located–for the suburbs, many station-districts also emptied of people and business activity.

Starting in the 1980s, however, and continuing to this day, railway stations have experienced a renaissance in many European countries.[20-23] As part of the building of a new HSR network infrastructure, municipalities in France, Germany, Spain, the Netherlands, Belgium, Italy, and the United Kingdom (UK) started revamping and significantly extending historic railway structures, and/or adding new station buildings, often designed by well-known architects. In many cases, this architectural fervor extended to the station's surrounding district, leading some scholars to talk about "rail station (area) megaprojects – broadly defined as private, public, and public-private sector-led transport, real estate, and/or public space investments inside and adjacent to major railway stations which total 100 million Euros or more."[24] Inventorying these rail mega-projects in 2012, Peters and Novy identified 136 projects planned in the previous two decades in Europe, with two-thirds of them developed during the first decade of the twenty-first century.[25]

Municipal ambitions to use HSR projects for urban restructuring, and as a catalyst for local development and enhancement of a city's image, are often behind such megaprojects.[26,27] Some of these projects have spurred impressive growth and development in formerly underperforming city areas, with new concentrations of office, retail, convention, entertainment facilities, and in some cases, housing. Successful examples include station projects in Lille (Euralille) and Lyon (Part Dieu) in France; Rotterdam (Rotterdam Centraal) and Utrecht (Utrecht Centraal) in the Netherlands, and Torin (Torino Porta) in Italy–discussed further in Chapter 4. But not all of the projects have been successful, and emerging literature seeks to understand the components of the success or failure of HSR station-area planning.

The chapter that follows summarizes this literature by discussing: 1) the types of projects that have evolved around HSR stations in the last decades; 2) the forces driving station-area development; 3) the challenges faced by such development; and 4) the strategies and factors behind successful station-area planning and project implementation.

HSR STATION AREA DEVELOPMENT PROJECTS: CHARACTERISTICS AND TYPOLOGY

In the book *Railway Stations and Urban Dynamics: High-Speed Issues*, Jean-Jack Terrin reviews the characteristics of HSR development projects in six European cities. He draws some basic characteristics, arguing:

> High-speed train stations may well be on their way of becoming a new architectural type, a kind of mobility infrastructure that is a cross between the airport hub, the service-oriented shopping centre, and a multicultural public space… They are based on two models: one which is probably outdated but still in existence is the 20th century transport infrastructure model; the other is more futuristic and gradually evolving: a centre connecting local and global and producing mobility-related services.[28]

However, not all HSR development projects are alike. Depending on the type of station-city, its aspirations and resources, different types of projects can emerge. For example, Pol distinguishes between '*international service cities'*–such as Barcelona, Amsterdam, Rotterdam, or Lyon–that aspire to be global players in the service sector and knowledge economy, and '*cities in transition*'–such as Lille, Marseilles, or Turin–that seek to boost and restructure their economy.[29] Both types of cities are likely to see the HSR station as an opportunity to attract more business and real estate development in the station district and beyond. But not all station-cities are in such a position, or even wish to do so. Looking at the United States (US–i.e., California) context, Loukaitou-Sideris identifies six categories of station-cities: *Large Metropolitan Center, Small Metropolitan Center, Suburban Employment Center, Suburban Dormitory, Exurban Dormitory, and Rural*.[30] The first three categories of cities are more likely to promote station-area development than the last three. San Jose is a large metropolitan center, and the type of development that may emerge around the Diridon Station will be quite different than the development that may emerge around Fresno–a small metropolitan center, or Anaheim–a suburban business center.

Some scholars have sought to create a typology of station-area development projects. Thus, Bertolini et al., identify three different frames of development in Europe:[31]

1. *Property capitalization projects* that took place mostly in the 1980s and focused primarily on the station building and block. Such projects were undertaken by railway companies and private developers, with the goal of value-capture and "cashing in on land owned by newly privatized railway companies."[32]

2. *Urban Mega-Projects* that took place mostly in the 1990s–some are still under development–and were significantly larger in scale, encompassing multiple blocks in the station area. Such projects were spearheaded by a boosterist public sector, aggressively seeking large private developers and big projects.

3. Lastly, emerging *transit-oriented development* projects take place in a number of polycentric European urban regions. Spearheaded by coalitions of regional governments and public transportation agencies, the scale of such projects is more modest, as they appear at multiple locations at stations across the railway network.

Peters and Novy identify four categories of Train Station Area Development:[33]

1. *Strategic Mega-projects* involve significant and large-scale development in the station-district, and require active government involvement and both public and private investment.

2. *Station Renaissance Projects* are primarily concerned with the redevelopment of station facilities, such as the remodeling and expansion of historic stations and their enhancement with shopping and entertainment.

3. *Transport Development Projects* primarily involve transportation infrastructure and improvements of a station's intermodality.

4. *Urban Development Projects* involve the (re)development of station-adjacent properties seeking to take advantage of their proximity to the train station.

Lastly, examining Spanish HSR projects, Bellet identifies three related categories of urban restructuring:[34]

1. Removing existing, centrally located conventional tracks and building HSR tracks at a city's periphery. Such projects free-up land at the city center that can be consequently redeveloped; at the same time, the new HSR station creates a "new centrality" and a secondary center in the city. This is the example of Ciudad Real.

2. Building the HSR station at a central location, but relocating pre-existing railway installations–e.g., railway yards, freight facilities–to peripheral areas. Such relocation of auxiliary facilities frees up significant land area, which can now be redeveloped as commercial and office space. This is the example of Zaragoza.

3. Introducing new HSR services in a central location by redeveloping and expanding a pre-existing conventional rail station, and simultaneously redeveloping the area around the station. This is the example of Lleida, and will be the example of San Jose.

Loukaitou-Sideris discusses six variables that intervene and influence the type of urban design strategy and station-area development (Table 1):[35]

1. Geographic context (large metro; small metro; suburban employment center; suburban dormitory, exurban dormitory, rural, airport related).

2. Ridership–origin, destination, both.

3. Station location–central or peripheral.

4. Network type–shared or dedicated tracks.

5. Guideway track–elevated, surface or tunnel.

6. Type of parking–structure or surface; concentrated or distributed.

The first three variables influence the mix and type of land uses and the type and size of development in the station-district. The last three variables affect the amount of station-adjacent developable land, as well as, how stations are integrated into their surrounding areas.

Table 1. Influences on Station-Area Development

Variable	Type of Station
Geographic context	Large metro center Small metro center Suburban employment center Suburban dormitory Exurban dormitory Rural Airport related
Ridership	Origin Destination Both
Station Location	Central Peripheral
Network Type	Shared track Dedicated track
Guideway Type	Elevated surface Tunnel
Type of Parking	Structure Surface Concentrated Distributed

Source: Loukaitou-Sideris, A. (2013).

FORCES THAT DRIVE STATION-AREA DEVELOPMENT

A number of authors have outlined the driving forces behind the proliferation of station-area development projects in Europe during the last two decades. Bertolini et al., identifies several innovations and changes as responsible for this proliferation.[36] These include technological innovations, institutional changes, public policies, and shifts in the spatial dynamics of contemporary societies.

Technological innovations, in particular, the development of the HSR technology, has helped minimize distances and improve the accessibility of station-cities. This enhanced accessibility is considered very important for many firms. and has triggered new development around stations. A prime example of this is Lille, which became an important crossroads between London, Paris, and Brussels after the opening of its HSR station, triggering very significant development in the station-district.[37]

Institutional changes, in the form of railway privatization, have led railway companies to behave as private entrepreneurs seeking to capture the accessibility and centrality advantages that HSR station locations are creating. They have pursued the development of commercial and entertainment services within the HSR station, and the development of land above or around the station. For example, the Spanish railway construction company

ADIF–Administrador de Infraestructuras Ferroviarias–has often entered into public-private partnerships with private companies for the development of commercial facilities, such as shopping centers, in its station areas.[38]

At the same time, city boosterism has often resulted in *municipal policies* seeking to take advantage of HSR, in order to improve a city's competitiveness in the global urban network.[39,40] Thus, a number of European station-cities have developed masterplans for HSR station-districts seeking to attract large-scale development projects. In some cases, such plans are part of national policies, such as in the Netherlands, where all six of the country's HSR stations are part of large development projects called 'New Key Projects,' and sponsored by the national government.[41] In addition to the motive of increasing economic competitiveness, such policies are often motivated by desires for more sustainable, walkable, and dense urban forms served by alternative modes of transportation. The development of high-density nodes around stations is, therefore, considered as promoting a desirable urban form. The building of such nodes has been enabled by public and private sector investments, but also by the availability of large parcels of developable land in the vicinity of many station-areas, left empty because of the deindustrialization of cities, and their shift to the new knowledge and service economy.[42,43]

Additionally, economic and social trends have altered the spatial dynamics of contemporary society, enabling increasingly, "footloose households and firms, which, however, do not just diffuse in space, but rather use space selectively, and locate in different places, depending on trade-offs that vary per actor and/or activity."[44] High accessibility and easy connections to other nodes, which characterize many European HSR stations, are considered a premium for the firms of the finance, insurance and real estate (FIRE) economy, increasing the desirability of locating there. As Kloosterman and Trip explain, "the high-speed train may facilitate the development of an international business center for two reasons: 1) it provides additional transport facilities which are important especially as knowledge-intensive businesses still very much depend on face-to-face contacts; 2) it provides an image that suits international business."[45] At the same time, easy access to services and amenities in high-pace, dense urban areas is also favored by certain households–singles, double-income/no kids, often the employees of these firms.

While the previously mentioned factors and forces explain the proliferation of station-area development around many HSR stations in Europe, Bertolini and Spit emphasize that each station is different, and specific economic and spatial factors may intervene at particular station locations, impeding or promoting development. Such factors include the condition of national and local economies and real estate markets, the position of the station-city in the hierarchy of other cities on the network and its proximity to other major (first-tier) cities, and the availability of developable land near the station;[46] these factors are not controlled by planners. A set of other factors, however, that planners control may help define good station-area planning, and will be discussed later in this chapter.

CHALLENGES OF HSR STATION-AREA PLANNING

The accommodation and smooth integration of transport and urban development is not a simple undertaking. One of the challenges of station-area planning is that stations

should balance the characteristics of a transportation node with those of an ambient place. Examining the forces behind station-area development around Dutch train stations, Bertolini discusses this node-place dynamic. He describes a model in which different station areas vary in regard to their value as a node and as a place, and gives examples of different station areas that fall into different categories or combinations.[47] Value as a node is a function of the accessibility of the HSR station, or how easily the traveler can get from it to other big cities. However, value as a place is a function of the intensity and diversity of activities in the station area. Put differently, many node stations serve as places of origin for travelers, while place stations serve primarily as destinations. Some stations combine both functions, as is the case with stations located at the central business districts of large metropolitan areas. Nevertheless, what becomes clear is urban design considerations should be different in stations that are nodes–origins or places–destinations, or both.

The dual nature of station areas needing to act as nodes, accommodating both transport and non-transport networks, and as places hosting a variety of diverse uses, generates a series of challenges. Bertolini and Spit identify five types of challenges:[48]

1. *Spatial challenges*, because of the compressed nature of most sites that should accommodate passengers passing through, station employees, local businesses, and local residents living in the station vicinity. Another spatial challenge is generated by the bulky railway infrastructure–tracks, railroad yards, auxiliary structures, parking spaces–that often creates a barrier effect separating the station from its surroundings. However, unlike airports that need vast amounts of land for airplanes to take-off and land, and are enclosed and cut-off from surrounding neighborhoods, railway stations can be integrated into dense urban contexts.

2. *Temporal challenges*, because transport investments do not necessarily have the same time horizons as redevelopment plans. This, combined with the generally long time frame of station-area development,[49] generates uncertainty, which is highly problematic for private developers. Real estate markets can also affect planning with significant fluctuation. Thus, "the general implication is that a plan that is too dependent on a particular property market or transport policy context could easily and rapidly become outdated."[50]

3. *Functional challenges*, because railway stations aspire to be multifunctional environments, acting as both transit hubs, and places for travelers and non-travelers to congregate. The multiplicity of activities within a relatively small area is challenging. Sometimes there is also a tension between the notions of a station as an open-access, public environment, and a transportation node that is highly controlled, enclosed, and secured.[51]

4. *Financial challenges*, because of the high cost of addressing technical difficulties and accommodating conflicting requirements. The fiscal constraints of the public sector often require reliance on private investments, in turn, leading to more intensive use of the land, higher floor-area ratios (FARs), and the predominance of offices, over other uses. Because of the high cost of development, some initial goals and plans for non-revenue producing amenities, such as public spaces, may have to be downsized, compromising the integrity of the plan.

5. *Management challenges*, due to the mix of public and private investments and properties, the many agents and stakeholders involved, and the need for coordination.

FACTORS THAT DEFINE GOOD STATION-AREA PLANNING

Development within HSR station districts is critically important, but is also challenging. Scholars, however, agree that proactive planning by municipalities is critical.[52] What contributes to good HSR station-area planning? As already mentioned, HSR stations should function as both transportation hubs and ambient places. Thus, scholars focus on both spatial–physical form related–and operational–transportation related–characteristics. A third set of factors encountered in good station-area planning literature relates to planning and policy factors.

More specifically, Nuworsoo and Deakin emphasize the importance of good intermodal connections, physical improvements–e.g., creating a greater concentration of retail establishments and cultural amenities, economic improvements–i.e., generation of more business activity, and social improvements–i.e., places for people to congregate) in HSR station-areas.[53]

A survey of HSR experts, administered by Loukaitou-Sideris et al., finds the most important preconditions for station-area development include: central station location, good integration of the station with its surroundings, station connectivity, good level of service, and strong political will and vision.[54] Cervero and Bernick observe that good access to the stations for vehicles and pedestrians has been a catalyst for development.[55] In more recent work, Eidlin also stresses the importance of good non-auto access modes and HSR–in particular, the use of bicycles.[56] Other authors also emphasize the importance of a station's node qualities, such as good connectivity with other modal choices–rail feeder systems, highway linkages, shuttles, etc.[57,58]

Cascetta and Pagliara emphasize the importance of coordinating land use around stations through densification, the location of major "traffic attractors"–such as important public buildings, and distinctive station architecture.[59] Similarly, Kloosterman and Trip underscore the importance of quality of place, arguing that, "quality of the urban environment, the quality of architecture and urban design and the attractiveness of public space, may actually pay by means of increased real estate revenues, despite the additional investment it requires."[60] The authors conducted two case studies, in Amsterdam and Rotterdam, to identify the different actors in station-area development, and the extent to which the private and public sectors view themselves as creators of place quality.[61] In another study, Trip discusses the quality of place from various perspectives: urban structure, functional diversity, quality of functions, public space, and architectural expression.[62]

Loukaitou-Sideris discusses urban design recommendations for good HSR station planning. She argues that stations should not be internally focused, but rather, well connected to their adjacent area. Thus, urban design strategies should seek to mitigate the barrier effect and integrate the station to its wider urban fabric, such as covering sections of the rail tracks, constructing rail bypasses and different types of railway crossings, adapting to specific topographic site conditions, and avoiding large amounts of surface parking around the station, instead, scattering parking structures in the surrounding area.[63]

A study examining the Randstad region in the Netherlands emphasizes the importance of the level-of-service–frequency and type of train services–at HSR stations in influencing decisions of offices to locate there. The authors find that stations offering HSR connections are favored as office locations, because of their greater accessibility. A secondary, but important, effect for office location relates to the architectural quality and aesthetic image of the station neighborhood.[64] Nevertheless, very few studies examine the aesthetics of HSR projects. An exception is Dovey, who discusses the architecture and urban design of Euralille, detailing how architect Rem Koolhaas has tried to build a new city geared toward a new sense of interacting at a global scale, and the desire to travel everywhere fast.[65]

The crucial question researchers ask is how to achieve such goals through the actions of governments and markets. According to Cervero and Bernick, development around HSR has been higher in cities with significant public sector involvement–e.g., Lille.[66] However, Lille may be a unique case, because the city's strategic position between London, Paris, and Brussels has contributed to its exceptional growth after the inauguration of HSR.[67] Murakami and Cervero emphasize that without proactive public agencies and local champions pushing for investment around stations, the effects of new HSR on economic development are likely to be small.[68]

Loukaitou-Sideris et al., note that station-city masterplans should carefully consider their local assets and competitive advantages, but also their regional context and economy in order to identify ways that these can be boosted by HSR. Thus, station-area planning should take into account, not only the immediate, half-mile radius station area, but also the five-mile radius, and in particular, the densest nodes or destinations within that wider region for jobs, services, and commercial activity. Particular attention should be given to ways these more distant nodes are well-connected to the HSR station by different transportation modes. At the same time, cities should seek to enhance "complementarity" with newly accessible neighboring areas, by identifying productive relationships with them, and seeking to attract the type of development that complements development in the neighboring stations.[69]

Because the full development effects of HSR may take decades to realize, planning must be undertaken as a set of phased goals that can be accomplished at various stages of system development.[70] The San Francisco Bay Area Planning and Urban Research Association (SPUR) recommends that HSR station-cities adopt land-assembly and land-banking strategies around their stations to maximize the value of future development. They also indicate that station-area planning should take into account value capture in the surrounding area, as a means for the public sector to generate desired development effects. There are several common methods of value capture, such as tax increment financing, special assessments, development impact fees, and joint development.[71]

Table 2 summarizes the physical, operational, and planning/governance related variables contributing to good station-area planning, as determined in the literature. As the authors will discuss in the next chapter, the 2014 Diridon Station Area Plan seeks to incorporate almost all the factors listed under the Physical/Spatial and Operational/Transportation categories. Additionally, Diridon Station's central location at the edges of downtown San Jose represents an asset. The variables that are less determined, however, as of the time of this writing, are those shown in the third column of the Table 2.

Table 2. Elements of Good Station-Area Planning

Physical/Spatial	Operational/Transportation	Planning Policy and Governance
- Central station location. - Good integration of station with surrounding area–minimization of barrier effect. - Densification of land uses around station. - Concentration of retail, commercial, and cultural amenities. - Public places and plazas for people to congregate. - Scattering of parking structures throughout station areas. - Availability of bicycle parking. - External station building orientation. - Distinctive architecture.	- Good intermodal choices and connections. - Good level of service. - Good pedestrian access to the station. - Good bicycle access to the station.	- Significant public sector involvement. - Political leadership/local champion. - Public-Private Partnerships - Coordination of different actors. - Consideration of both local and regional context / complementarity. - Multi-phased planning. - Land assembly; land banking. - Value capture.

Source: Authors.

III. DIRIDON STATION-AREA PLANNING

California voters approved Proposition 1A in November 2008, issuing general-obligation bonds to fund the initial stages of a HSR system linking Northern and Southern California. Diridon station in San Jose was soon identified as one of the key stations along the route. The City began to ready the station for the arrival of HSR, embarking upon a process properly anticipating the maximum possible build-out of new transit-related developments. To better understand the characteristics, current planning vision, perceived challenges, and opportunities for station-area development at Diridon station, this chapter presents first an overview of relevant plans and other planning documents. This is followed by a synthesis of interviews with knowledgeable stakeholders about the process of planning at Diridon, and the associated challenges, prospects, and opportunities.

DIRIDON STATION-AREA PLANNING EFFORTS

At the end of the twentieth century, a number of planning efforts started in earnest in San Jose for the downtown area and its adjacent neighborhoods. According to architect Frank Fuller, who was involved in station-area planning as a principal for the consulting firm Field Paoli: “From 1999 through 2001, Field Paoli led a consultant team that produced a plan for ‘Greater Downtown San Jose,’ which was completed for the City’s Redevelopment Agency at that time. It included the neighborhoods around downtown, as well as downtown, and the area around the Diridon Station was one of the neighborhoods. In 2001, high-speed rail was considered to be far into the future and the City did not want to include it in the plan.”

A later planning document published in 2010, and related to Diridon Station, was the Alameda Plan–a community vision for one of San Jose’s most unique corridors, located immediately to the north of the station.[72] The plan was prepared by BMS Design Group and Kimley Horn Associates for the San Jose Redevelopment Agency and Caltrans. It presented design recommendations, “intended to help enliven The Alameda as a retail center and multi-modal transportation corridor and to foster economic development, while at the same time protecting the historic neighborhoods that surround it and making it the destination of choice for residents of the area.”[73] The future transformation of Diridon Station was clearly a major motivation for taking action on the Alameda Plan at that time, and the project’s boundaries encompassed the station (Figure 1, bottom right). As stated in the plan:

> *The Alameda plays a unique and important role in San Jose as a gateway to the city and downtown. […] At the southern end of the project area is San Jose’s major multi-modal transit center at Diridon Station, poised to grow with a future BART station and High Speed Rail. The Alameda is a major bus service route for the Santa Clara Valley Transportation Authority (VTA) bus network. The adjacent community includes historic residential neighborhoods, local serving retail, and new higher-density infill development near the Diridon Station.*”[74]

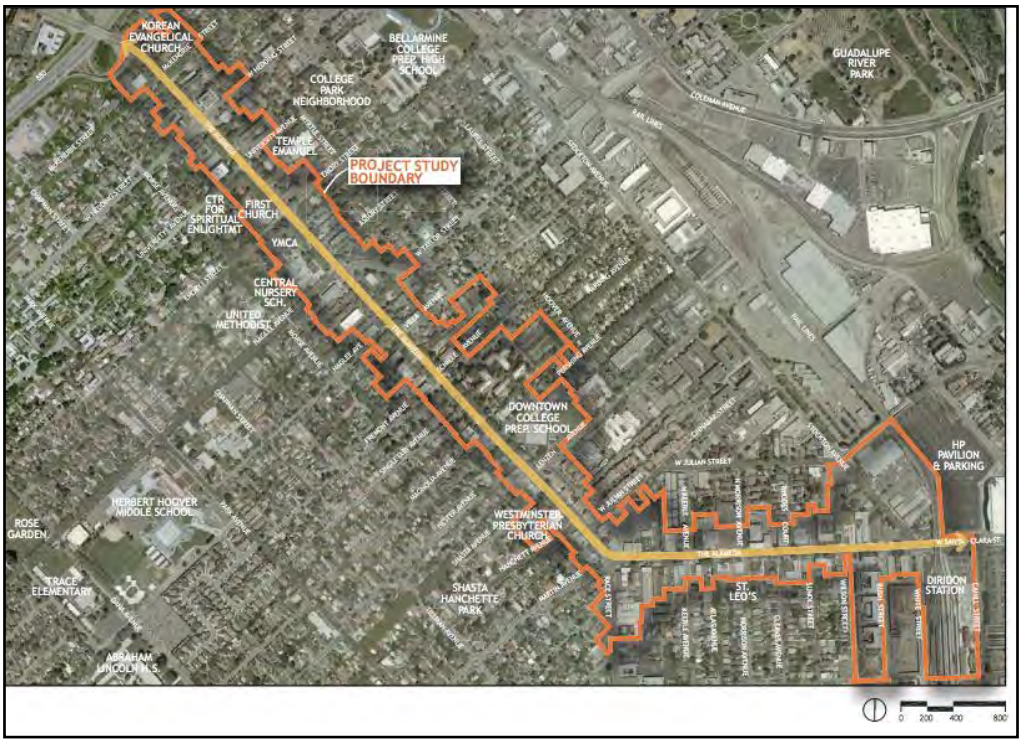

Figure 1. Project Study Boundary for the 2010 Alameda Plan

Source: The Alameda Plan, p.2-2 http://www.sjredevelopment.org/TheAlameda TransportationImprovements/TheAlamedaPlan.pdf

The first two Diridon-specific reports released by the City, as part of the station area development grant, were the Existing Conditions Report, published in March 2010,[75] which included an evaluation of existing and proposed land uses, market, regulatory, and infrastructure conditions, and the Alternatives Analysis Report, published in July 2010,[76] which presents a summary of three project alternatives–with some conceptual design work and massing–and an evaluation of their relative merits. Alternative A included mostly residential land uses, Alternative B mostly sports and entertainment, and Alternative C mostly commercial uses. However, with many unknowns at the time, it was difficult to assess how services would interact with one another.[77] Parallel to the completion of these initial reports, a multi-year public engagement process commenced to develop the Diridon Station Area Plan (DSAP).[78]

Additionally, in September 2010, the Urban Land Institute (ULI) published the study California High Speed Rail TOD Market Place on transit-oriented-development (TOD) opportunities around new California HSR stations,[79] providing a useful analysis of the real estate surrounding the station (see Table 3). The ULI panel of experts, who authored the study, recommended the creation of a complete, twenty-year, high-density TOD-specific plan and comprehensive EIR, including the following provisions:

- Reduced auto dependency and parking footprint through shared parking and transportation demand management program, administered by a Transport Management Agency.

- Increased building height caps.
- Policies that support high-density office uses in the core area.
- Policies that support high/mid-density workforce housing.
- Short- and medium-term development focused on dining, entertainment, and convenience goods.
- Improved connectivity to and from central Diridon, to the surrounding neighborhoods and the downtown.
- Creation of a unique destination characterized by a landmark station, memorable architecture, people-oriented urban design, and intimate public spaces.
- Dedicated shuttle service to and from downtown and the airport.
- Creation of a mixed-use, multi-purpose ballpark.
- Establishment of a formal Diridon Advisory Group and a Joint Development Authority to ensure the successful implementation of the plan.
- Creative approaches to building and programming an elevated HSR viaduct.

Many of the recommendations of the ULI report found their way into the final DSAP.

Table 3. Diridon Station Area Summary Information

Study Location:	**City of San Jose, Santa Clara County**
Incorporated Status:	*1850*
Total Area:	*178.2 square miles*
Bordering Cities & Communities	*Campbell, Milpitas, Santa Clara, Los Gatos, Morgan Hill*
People	
Total Population:	*1,023,083 (Jan 2010)*
Avg. Population Density:	*5,741 people per square mile*
Estimated Total Housing Units:	*307,614*
Racial Makeup:	*White - 31.8%, African American - 2.9%, Asian/Pacific Islander - 30.6%, Other - 2.9%, Hispanic or Latino (of any race) - 31.9%*
Median Age:	*35.6 years*
Median Household Income:	*$80,616*
Transportation	
Public Transit Access to Study Area:	*Current: Caltrain (commuter rail), Altamont Commuter Express, Amtrak, Valley Transportation Authority Light Rail, regional/local bus routes, Planned: California High-Speed Rail, Bay Area Rapid Transit (urban rail), Bus Rapid Transit, POD Car System.*
Major Vehicular Access to Study Site:	*State Route 87, Interstate 880, Interstate 280*

Study Location:	City of San Jose, Santa Clara County
Predominant Modes of Transportation:	*Drive Alone - 77.8%, Carpool - 9.2%, Transit - 4.1%, Walk - 1.8%, Bicycle - 1.2%, Other - 5.8%*
Identity	
Major Industries:	*Professional & Business Services; Durable Goods Manufacturing; Trade, Transportation & Utilities Services; Educational & Health Services, Government*
Major Tourist Draws:	*San Jose Sharks (NHL), HP Pavilion, San Jose Convention Center, performing arts & museums*
Key Historically-Known Aspects:	*Capital of Silicon Valley*
Unique Characteristics to Identity:	*#1 in technology expertise - the San Jose area is home to the largest concentration of technology expertise in the world-over 6,600 technology companies employing more than 254,000 people*

Source: ULI (2010) HSR TOD Study (p.47).

In March 2014, SPUR, a local nonprofit with the mission of promoting good planning and good government in the Bay Area, published The Future of Downtown San Jose,[80] presenting a comprehensive guide of development opportunities in San Jose, with special attention to both Downtown and the Diridon station-area (Figure 2).

In this report, SPUR presents six ideas for achieving a more successful and active downtown, namely to:

- Welcome all kinds of uses into downtown, but hold out for jobs near regional transit.
- Make sure what gets built adheres to key urban design principles.
- Promote a larger area of “Central San Jose,” with downtown as its core.
- Make it easier to get to and through downtown without a car.
- Retrofit downtown to be more pedestrian-oriented.
- Build on downtown’s strengths as the cultural and creative center of the South Bay.

The report also presents over two dozen specific recommendations on how to achieve these ideas, many of them with specific relevance for the Diridon station-area. They include the following:[81]

- Expand the existing network of paseos, or pedestrian walkways, throughout downtown. In particular, extend the Paseo de San Antonio to Diridon Station.
- Use downtown as a demonstration zone for achieving the City’s goal to reduce solo driving to just forty percent of all travel by 2040.
- Reserve major unbuilt sites around Diridon Station and near Market and Santa Clara streets for jobs.

- Eliminate minimum parking requirements in new development.
- Require new development to have tall ceiling heights and active uses on the ground floor.
- Make downtown a “park once” environment, where people prefer to park their car getting from place to place on foot.
- As a precursor to HSR, create a faster Caltrain bullet service that connects San Jose and San Francisco in less than sixty minutes.
- Make light rail faster by speeding up the trains, studying double tracking, and reducing the number of stations.

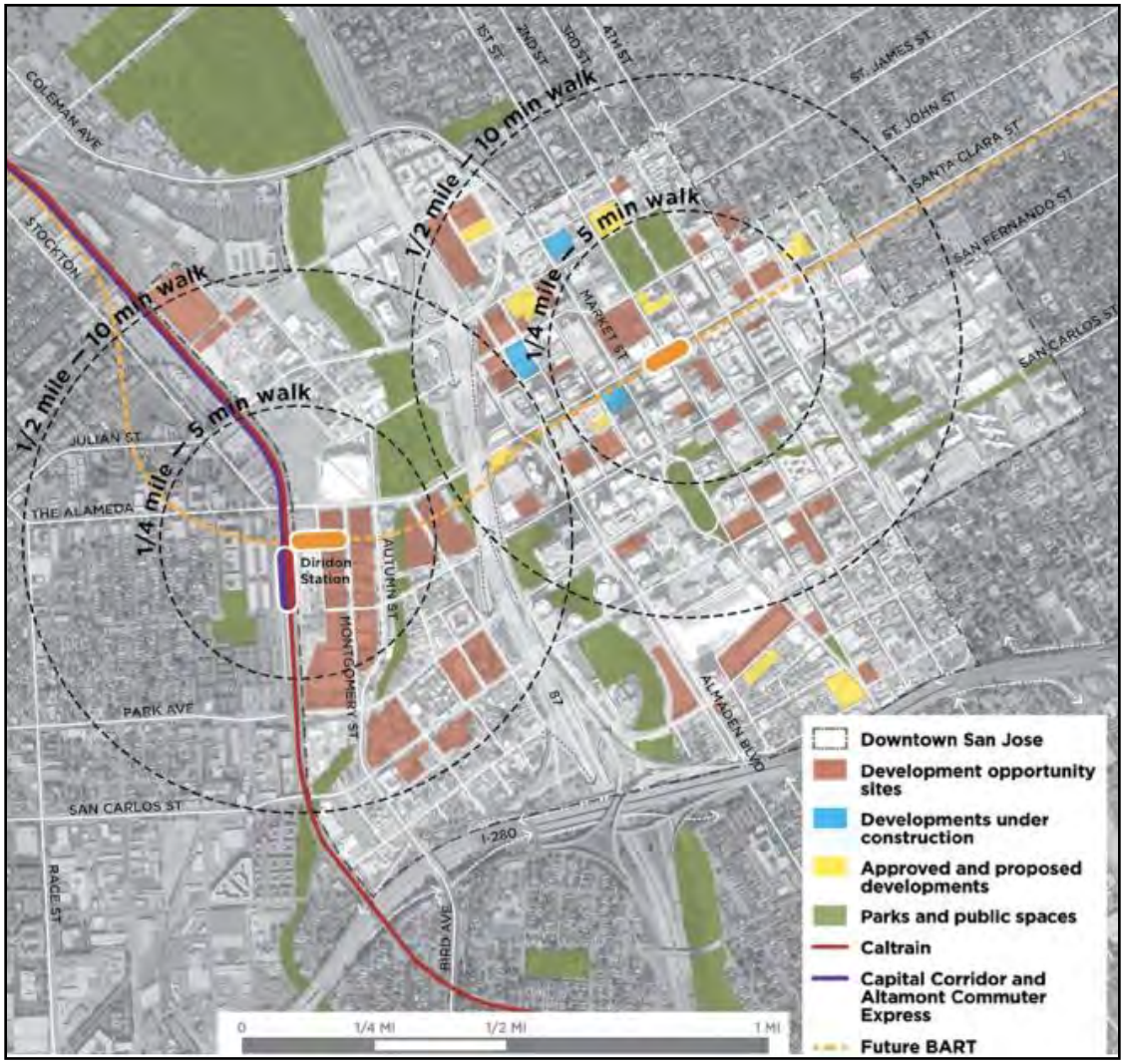

Figure 2. SPUR Report Illustration on Development Opportunities in Downtown San Jose

Source: SPUR (2014), p.19.

THE 2014 DIRIDON STATION-AREA PLAN

During the same time, the City was also involved in a major planning effort of a comprehensive plan for the Diridon station area. In 2009, the City issued three requests for proposals that were eventually combined into one: 1) the overall station area plan for the 240-acre area surrounding the station; 2) the station itself; and, 3) related environmental work. Each request was led by a different consulting firm, but the different subcontractors were under the coordination of Field Paoli.[82] The planning process took a total of five years–2009-2014, as it stopped and started several times.[83] Finally, in June 2014, the San Jose City Council adopted the DSAP, and also certified the pertaining EIR. The 319-page DSAP sets out a thirty-year vision for the future planning of the Diridon station-area, likely to undergo significant transformations in the next decades, due to the planned arrival of high-speed and electrified commuter rail, as well as, the City's efforts to effectively re-assign a station-adjacent area originally intended to house a major-league baseball stadium.

This work was funded by a $750,000 grant from the Metropolitan Transportation Commission's Station Area Planning Grant Program, while VTA and the City contributed an additional $200,000 to the planning effort. Three public community workshops, led by Field Paoli, gave numerous stakeholders, including individuals, businesses, agencies, institutions, and many private and public entities the opportunity to provide input into the DSAP. For the actual document, the following key agency stakeholders were invited to participate in the development of the DSAP's final plan report:

- City of San José, Department of Transportation
- City of San José, Department of Planning
- City of San José, Building and Code Enforcement
- City of San José, Department of Housing
- City of San José, Office of Cultural Affairs
- Association of Bay Area Governments
- VTA
- Caltrain

Additional related documents include a 10-Year Horizon Analysis Report,[84] an Implementation Strategy Report,[85] and the Integrated Final Program Environmental Impact Report.[86]

Plan Objectives, Key Themes, and Goals

The Plan's study area includes 240 acres that exist within a half-mile radius of the Diridon station. The primary project objectives of the DSAP are the following:

- Establish a land-use plan and policy framework guiding future development and redevelopment toward land uses supporting transit ridership and economic development, and create a world-class cultural destination;
- Improve pedestrian, bicycle, motorized and transit connectivity between the station site and existing adjacent commercial and residential areas;
- Develop and implement urban design standards that promote walkable, livable, and business-supportive environments within the Diridon station area;
- Provide a variety of commercial and mixed-use development opportunities, ranging from large-scale corporate or institutional sites to smaller infill development sites;
- Create a highly active and lively pedestrian- and bicycle-friendly environment with excellent connectivity to downtown destinations and regional transit;
- Expand Diridon Station to create a well-integrated center of architectural and functional significance;
- Ensure the continued vitality of the San José Arena (SAP Arena), recognizing that the Arena is a major anchor for both Downtown San José and the Diridon Station area, and that sufficient parking and efficient access for Arena customers, consistent with the provisions of the Arena Management Agreement, are critical for the Arena's on-going success;
- Enhance the existing neighborhoods and add high-density residential- and commercial mixed-use development within the study area, and to act as a catalyst for similar developments in surrounding areas;
- Prepare a program-level environmental clearance document which anticipates the maximum build-out to facilitate subsequent project-level environmental review, possible changes to existing policy/regulatory documents, capital improvement projects, and private development proposals;
- Educate and inform the public about the area planning process and TOD concepts; and,
- Create a great place in the City as a local and regional destination.[87]

The DSAP succeeded in establishing an overall land-use plan and policy framework for the area that included the following four key themes:

- Establish the station and surrounding area as the local, citywide, and regional destination where residents and visitors alike can live, work, and play.

- Foster a vibrant public realm throughout the station area supporting pedestrian activity, and integrates public spaces into development with new plazas, parks, and public spaces.

- Reflect the Silicon Valley spirit of innovation and San José's rich history of transformation and progress through iconic, world-class architecture, distinctive civic spaces, and dynamic built environments.

- Create a strong sense of place for the Diridon station-area, and an identifier for San José as the center of Silicon Valley, and the technological capital of the world.[88]

These themes relate to the following specific goals:

- *Urban Form and Structure.* Create an urban district in the station area with buildings that maximize height potential. The station area should accommodate a mix of uses, including commercial, office, and entertainment development.

- *Connectivity*. Establish and strengthen connections to surrounding districts and within the planning area for pedestrians, bicyclists, and motorists, with emphasis on east-west connectivity across State Route 87 and the rail corridor.

- *Transportation.* Prioritize pedestrian circulation and transit. Improve pedestrian and bicycle connection to Guadalupe River from the station area.

- *Compatibility with surrounding neighborhoods*. Ensure sensitive transitions in scale and design to surrounding residential neighborhoods.

- *Land Use*. Provide a range of commercial and residential uses; commercial uses would include neighborhood services for surrounding residential areas, and a synergistic mix of entertainment, hotels, shopping, restaurants, and offices.

- *Open Space*. Enhance and expand recreational opportunities in the station area, establishing an open space system integrated with Los Gatos Creek and Guadalupe River Park.

- *Art.* Activate the streets, parks, and station with art that engages visitors and residents alike. Integrate art into infrastructure to humanize and enliven standard features.

- *Parking*. Disperse parking in different locations in the planning area and beyond, ensuring easy walking access to destinations.[89]

Plan Areas and Zones

For analytic purposes, DSAP differentiated between eight different sub-areas in the study area, namely A: Arena North; B: Transit Center; C: Stockton Corridor; D: Dupond/McEvoy; E: Royal/Auzerais; F: Park/San Carlos; G: Potential Ballpark/Station South; and H: Station East (also see Figure 3).

Figure 3. Diridon Station Area Plan Sub-Areas

Source: DASP 2014, p. 1-6.

The DSAP design and planning team aggregated these different areas into three major zones, namely a 'Northern Innovation Zone,' a 'Central Commerce and Entertainment Zone,' and a 'Southern Urban Neighborhoods Zone' (Figure 4). DSAP calls for a total of 2,588 residential units (15% affordable), 4.96 million square-feet of office, 420,000 square-feet of retail, and 900 hotel rooms. FARs are largely set based on the height limits–about 130 feet, because of the proximity of the site to the airport.[90] The planners are very careful to note there are still many different ways in which the area could be laid-out and still fulfill the objectives of the overall masterplan, so they emphasize that the final composite (Figure 5) represents but one of several possible solutions. In particular, the area for the proposed ballpark remains a major unknown that likely has to be rethought. Nevertheless, most likely there will be a continuation of the proposed office and commercial uses, in the area initially envisioned as a ballpark.[91]

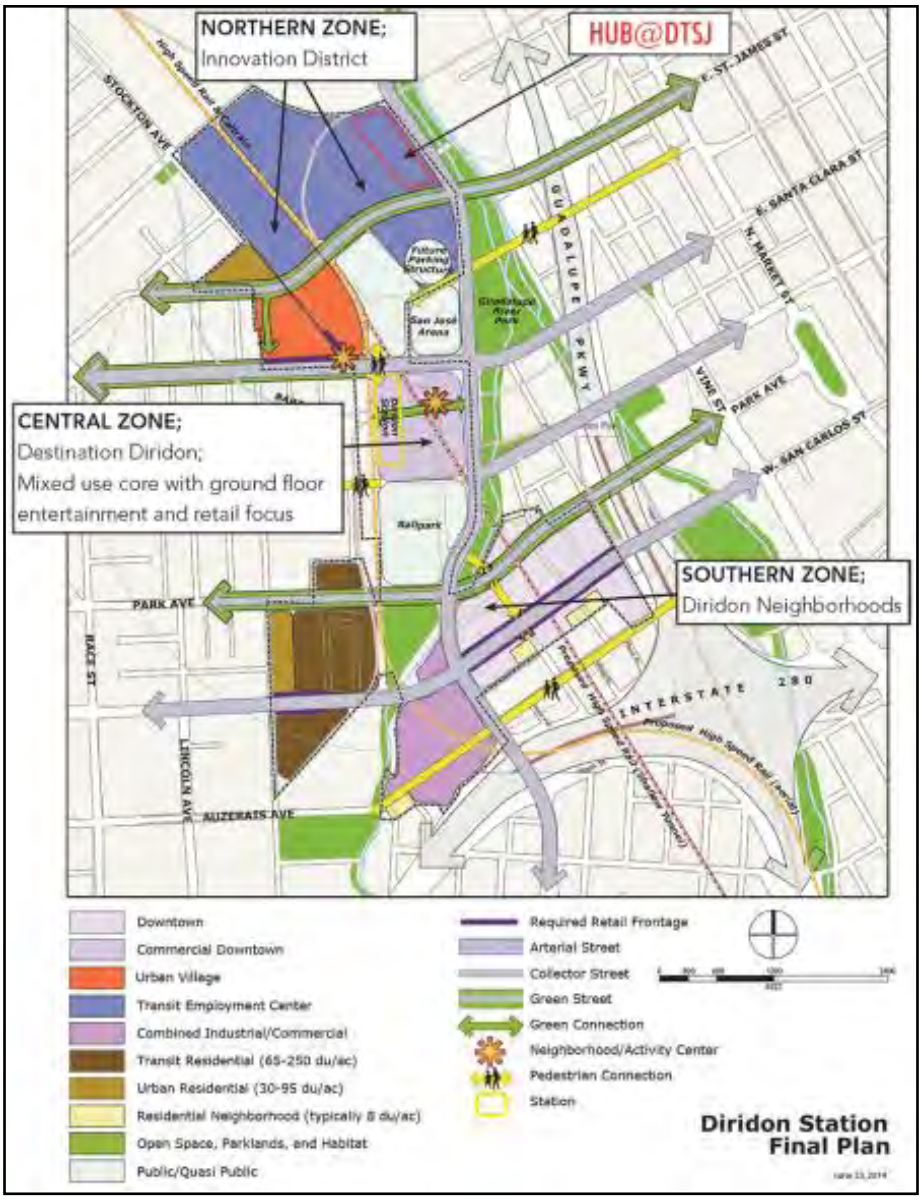

Figure 4. DSAP Land Use Plan Summary

Source: DSAP 2014 (p. 2-2) and *http://www.hubatdtsj.com/images/DSAP_land_use_map_fullscreen.png*

Figure 5. Diridon Station Area Preferred Composite

Source: City of San Jose (2014).

Station Massing

DSAP already provides some suggestions about the station's built form and overall layout (Figure 6). As noted above, however, detailed design suggestions would be premature, as CHSRA, as of this writing, was undertaking environmental review processes for the blended-service corridor segment from San Francisco to San Jose, and for the segment from San Jose to Merced, and there are still many factors that can influence the ultimate layout and height of the station building.

Figure 6. Proposed Diridon Station Massing

Source: DASP 2014, p.2-77.

Current Planning Activities and Realities

The major difference between the 2014 plan and the current reality is there will most likely be no baseball stadium, requiring a re-thinking of this central area. For many years, the City actively sought to attract the Oakland A's baseball team and build a new, state-of-the-art ballpark adjacent to the new Diridon Station complex within ten years. This ambitious plan suffered a major setback in the courts, however, and is currently less likely to come to fruition as Major League Baseball franchise officials continue to block the team's move. While development of a stadium seems unlikely as of this writing, other developments around the station and its vicinity is generally quite strong–see Figure 7 for a listing of all nearby active development projects.

CHSRA's 2012 Business Plan already confirmed that HSR service into San Francisco is to be a "blended service," sharing electrified Caltrain tracks. California Senate Bill 1029 (Chapter 152, Statutes of 2012) allocated $705 million towards the $1.45 billion needed to improve the corridor between San Francisco and San Jose. The Peninsula Corridor Electrification Project Final EIR was released in January 2015. According to the CHSRA 2014 Business Plan, there is to be 'Bay to Basin' HSR service from San Jose to the San Fernando Valley by 2026, and full one-seat-ride service from San Francisco to Los Angeles via San Jose by 2028.

CHSRA is currently completing preliminary engineering and NEPA/CEQA environmental review for the two segments from San Francisco to San Jose, and from San Jose to Gilroy. The 'Notice of Preparation' for this review was published in May 2016 (Figure 8). As part of this review process, the alignment and vertical profile for HSR through the Diridon Station Plan Area continues to be refined, and no exact time for the beginning of construction has been announced. Major design challenges, such as the decision on whether the approach to and/or the station itself would be aerial or tunneled, have not been resolved. According to DSAP, CHSRA, "prefers an alignment through the Diridon Station Area along an elevated structure above the existing surface Amtrak/Caltrain/ACE tracks to the north of the station and at the station itself," while to the south, "the alignment would curve to the east as it leaves the station heading south, and follow Interstate 280 and State Route 87."[92]

OFFICE (New office planned in survey area: ±2,300,000 sf)

	Name	Size	Comments	Status
A	Railyard Place - Insight Realty Co.	240,000 sf - Office/R&D	Application Pending	
B	River Corporate Center - Bldg 111	Foundation Only	192,000 sf	Foundation Permit Only
C	DiNapoli	Up to 1 million sf	±1,000,000	Planning Stage
D	374-408 West Santa Clara Street	Planned Bldgs A + B (7-9 Stories), ±724,000 sf	Planning Stage	GP in place
E	AC Hotel Marriott	7 Stories - 210 Rooms	Hotel	Under Construction
I	Boston Properties	±3.2 Acres	No Current Permit	FAR TBD
II	Riverpark Towers	±321,628 sf	±19,735 sf floorplates	50% Available

RESIDENTIAL (Units planned and under construction: 4,700+ dwelling units)

	Name	Size	Comments	Status
1	Mill Creek	7 Stories - 168 Units	22,000 sf of Retail	Under Construction
2	138 Stockton Avenue	6 Stories/166 Units	9,000 sf of Retail	Application Stage
3	Railyard Place	±400 Units	Under Application Review	GP Modification Required
4	195 West Julian Street	408 Units	Combines with #5 for 721 Units	
5	201 West Julian Street	18 Stories/313 Condos	Combines with #4 - 721 Units	
6	Silvery Towers	2 Towers @ 20 Floors 1 Tower @ 22 Floors 643 Condos	20,000 sf of Retail	Under Construction
7	Centerra	21 Stories - 347 Rental Units		Completed 12/21/2015
8	VTA Parking Lot	No Current Application		Parking Lot
9	Alameda Square	Under Construction		To complete 06/2015
10	1 South Market Street	23 Story Tower - 312 Units	±6,500 sf of Retail	Fully Occupied
11	Post Street Tower	21 story Tower - 180 Units	±7,000 sf of Retail	Planning Stage
12	Timmmoli Crew Site	1-9 Stories, 325 Units (estimated)		Planning Stage
13	150 South Second Street	23 Stories - 399 Units	Some Retail Planned	Planning Stage
14	300 South Second Street	12 Stories	Student Housing	Planning Stage
15	The Pierce	8 Stories - 230 Units	±3,500 sf of Retail	Under Construction
16	The Museum Project	300 Units - 185 Suites	Hotel a part of Project	Under Negotiation with City
17	470 West San Carlos Street	2 Bldgs @ 6 Stories	143 Units	Planning Stage
18	443 West San Carlos Street	23 Stories - 399 Units	Some Retail Planned	Planning Stage
19	201 Delmas Avenue	117 Units	GP Approved	Planning Stage

Figure 7. Development Projects around Diridon Station, as of March 1, 2016

Source: http://www.hubatdtsj.com/images/HUB_at_DTSJ_flyer_CW.pdf (p.3).

SUBJECT: Notice of Preparation of a Project Environmental Impact Report/Environmental Impact Statement for the California High-Speed Rail System, San Francisco to San Jose Project Section, Blended System Project

The California High-Speed Rail Authority (Authority), as the Lead Agency for the California Environmental Quality Act (CEQA) process for a proposed California High-Speed Rail (HSR) system**, is rescinding the Notice of Preparation (NOP) for the San Francisco to San Jose Project Section published in December, 2008,** and will jointly prepare an Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) for the San Francisco to San Jose Project Section (Figure 1) of the California HSR System, Blended System Project, in compliance with CEQA and the National Environmental Policy Act (NEPA). The Authority is now issuing this new NOP to inform stakeholders (members of the public; Tribes; federal, state and local agencies; organizations, and other parties) about the Blended System Project and solicit their input on the scope of the EIR. The preparation of the San Francisco to San Jose Project Section EIR/EIS for the blended system will involve a scoping and public outreach process; development of preliminary engineering designs; and assessment of environmental effects associated with the construction, operation, and maintenance of the HSR system, including track, ancillary facilities, and stations, along the Caltrain corridor from San Francisco to San Jose.

The Authority and Federal Railroad Administration (FRA) will hold scoping meetings and outreach activities as part of the CEQA/NEPA process.[1] FRA is the federal lead agency for NEPA and will publish a Notice of Intent (NOI) in the Federal Register, announcing that FRA is rescinding its 2008 NOI and issuing a new NOI to initiate the federal environmental review process for the San Francisco to San Jose Project Section of the California HSR System, Blended System Project.

Figure 8. CAHSRA's Notice of Preparation of a PEIR/PEIS, May 9, 2016

Source: CAHSRA website at *https://www.hsr.ca.gov/docs/programs/statewide_rail/proj_sections/SanFran_SanJose/SF_SJ_NOP_Filed.pdf*

Meanwhile, the extension of BART to Silicon Valley is in progress, but the extension to the Diridon station area will not occur until Phase 2 of the BART extension project, for which funding is not yet fully secured. According to the official project website:

> *In keeping with voter-approved Measure A, VTA is committed to delivering the full 16-mile extension of the BART line to Santa Clara County, known as VTA's BART Silicon Valley Extension*." ..."*Diridon Station would be located just south of West Santa Clara Street, between Autumn Street and the San Jose Diridon Caltrain Station. This station would consist of below-ground concourse and boarding platform levels. Street level pedestrian connections would be provided to the San Jose Diridon Caltrain Station, and VTA's Diridon and San Fernando light rail stations. This station would also include bicycle facilities*.[93]

The current station-area plan assumes the underground station structures–"station box"–for the future Diridon/Arena BART Station will be constructed within ten years, ideally concurrent with new development in the adjacent area, in order to minimize future disruption, but again, details are yet to be resolved (Figure 9).

Figure 9. Conceptual Plan of VTA BART's Station at Diridon

Source: http://vtaorgcontent.s3-us-west-1.amazonaws.com/Site_Content/PhaseII_concept_exhibit-Diridon_LETTER.pdf

AECOM and SOM consultants have also been hired to prepare a so-called 'Intermodal Study,' evaluating how the different transit modes can best co-exist and complement each other at the station.

CHALLENGES, OPPORTUNITIES, AND PREREQUISITES

Together, with many additional planning documents released by the City, CHSRA, Caltrain and other state and federal planning agencies–most of which were subjected to intense public scrutiny, the station-area plan documents released so far represent a significant planning effort aimed at creating a unique multi-modal facility, surrounded by new, state-of-the-art development. The building of major infrastructural projects, such as HSR stations, however, often encounter several specific challenges. To better understand these challenges, but also the prospects of station-area planning at San Jose, Diridon, as well as the opportunities generated by the coming of HSR, we interviewed the following four knowledgeable individuals–see Appendix C for interview questions:

1. Ben Tripousis, Northern Regional CHSRA Director, previously the manager of the San Jose Department of Transportation,

2. Jessica Zenk, San Jose Division Manager, Department of Transportation,

3. Frank Fuller, Partner, Urban Field Studio, and,

4. Laura Tolkoff, SPUR San Jose Policy Director.

Challenges

The interviewees identified a number of challenges relating to station-area planning at Diridon. Some of these challenges are characteristic of megaprojects, while others are specifically associated with HSR projects, and others still are site- and context-specific. Table 4 lists these challenges.

Table 4. Challenges of Diridon Station-Area Planning

Megaproject specific	- Economics - Timeframe uncertainty - Attracting private investment - Multiplicity of actors - Governance
HSR-project specific	- Modal integration - (Uncertainty over) Type of alignment - Barrier effect
Site/context specific	- Car dependency - Parking situation - Proximity to airport (height restrictions) - Limited east-west connections - Lack of community redevelopment agency

Source: Authors.

Economics

Megaprojects are characterized by very large budgets.[94] The development of Diridon station and the 240 acres that surround it is a major undertaking, and one that will require a significant amount of investment from the City. CHSRA's budget includes the development of station platforms and other rudimentary station improvements, but does not cover the significant costs related to station-area improvements, and the building of the station structure(s). As emphasized by a number of interviewees, how the City ensures adequate funding for building a major transportation hub and an 'iconic' architectural facility, as well as, purchasing and consolidating developable sites around the station, represents an important challenge, one that can influence the overall success of the project. At the same time, public investment is often considered a prerequisite to trigger private development. As Ben Tripousis emphasized, "the only way to get private capital into the game is when there is a significant and ongoing commitment of public resources."

However, as emphasized by Laura Tolkoff:

> *There is definitely a shared commitment to make Diridon Station into a bold and iconic station. However, there isn't any funding for a central station at the moment. It's possible that there will be a temporary station, or that the station will have to be built iteratively. It is important to have a very strong commitment for bold and cohesive design at the outset by involving designers in the plans for the station, by having strong advocates for high-quality architecture and design in executive roles, and clear expectations and enforcement for urban design in the station area.*

Other than building an iconic station structure, availability of funding would enable the City to purchase and consolidate land around the station.

Uncertainty of Timeframe

Another challenging characteristic of megaproject development is uncertainty. As explained by Jessica Zenk, "A major challenge of the project relates to the uncertainty with its timeframe. …It has been very hard to plan with each of the transit systems having their own set of uncertainties about their timing, about their funding, about their alignments. It is quite a multi-variable equation."

Attraction of Private Investment

Uncertainty also makes the attraction of private development more challenging, and this is a rather common characteristic of megaproject development. In the case of Diridon, there seems to be, at the moment, some, but not overwhelming interest from local developers. According to Tripousis:

> *Developers are a little reluctant at the moment. Most developers in this area make their money on housing, and this is not a housing-rich area around the station. So there has been some interest but not an overarching level of interest… Developers also have some significant concerns about how the HSR will come into the station; they have expressed concerns, especially for housing development, if HSR comes in an aerial configuration—and I'm not sure exactly why that's the case. Let's just say they are not identifying the iconic architectural and design opportunities that an aerial facility would bring, and they see more the matter of dividing the community and negative impact from a development standpoint.*

Multiplicity of Actors

Another common challenge of megaprojects is the multiplicity of actors and stakeholders that represent different interests in the project. In the case of San Jose, these actors include municipal and county agencies, CHSRA, a variety of transit operators–VTA, BART, Caltrain, the San Jose Sharks–who have the activity rights to the Arena, private developers, community groups, etc. Coordinating, negotiating, and reaching agreements among these actors is not trivial.

Governance

How these different stakeholders share power and reach participatory decision-making is one of the most challenging aspect of a megaproject,[95] and this is also true for the Diridon station project. As Tolkoff noted:

> *One of the things that can be learned from European stations is the role of governance in determining station outcomes—whether it's how functional the station is, how usable it is, or whether the project is delivered on time and on budget. These examples show that it is important to clearly articulate the project's ambitions but also its challenges and*

> *interdependencies, and then design organizations, operating structures, partnerships, and decision-making and oversight protocols to overcome those challenges. It includes outlining the things that require cooperation, the things that need to be centralized, and an understanding of what's at stake if those things are not addressed. European cities are good at identifying a vision and what it takes to deliver that vision.*

A Joint Policy Advisory Board (JPAB) was established in 2010 to oversee the Plan's development, and has been seen as a stepping stone towards a firmer governance structure, even though its role is only advisory. JPAB includes representation from BART, the City, VTA, Caltrain, the State of California, and CHSRA. According to Zenk:

> *There is a lot of good will and good intension to communicate, but we are all recognizing how difficult it is to advance and communicate about individual projects [BART, HSR] and advance the larger vision…. We believe it will be helpful and necessary to have a Joint Powers Authority but we did a lot of research to learn from other places and believe that we should not jump in to create a JPA before we fully understand how it should be structured.*

At the moment, JPAB only has advisory powers. As noted by Tolkoff:

> *The Diridon Station Joint Policy Advisory Board is meant to be a precursor to a more formal coordination body, such as a JPA. The role of the [JPAB] today is to inform elected officials and community representatives about the projects that are happening in their district. The Board does not have an official mandate to make decisions about the projects collectively, although each member of the Board individually has significant decision- making authority and ability to influence these projects.*

On the other hand, interviewees characterized as "very good" the level of coordination and cooperation among staff participating at the *Diridon Intermodal Group*. This group was developed out of JPAB at the recommendation of Senator Jim Bell, who wanted the local agencies to work together with the transportation providers–Caltrain, VTA, and HSR–to identify how they can generate revenue to develop an expanded station area.[96]

A second set of challenges is not unique to the San Jose project, but characteristic of HSR projects worldwide. These include:

Modal Integration

Modal integration of a HSR station is of critical importance to its success.[97] In addition to high-speed, conventional, commuter, and light rail, San Jose Diridon Station will offer bus, taxi, shuttle, and other onward connections that all have to be accommodated smoothly and efficiently within the station vicinity. Tripousis considers this multi-modal integration as the biggest challenge of station-area planning. He notes:

> *Diridon Station will actually have more modal connections than the Transbay Center in San Francisco. So that's important, and how do you make the most effective use of those connections by making the transfer, from light rail, to Caltrain, to HSR, to local*

> *buses, to ground transportation, to last mile services–whether it's pedestrian or bike access–how do you make that transition as seamless as possible? How do you provide resources that allow people to make those connections as seamless as possible, akin to the Deutsche Bahn (DB) Card and the ability to use the same [ticket] from one transportation system to the next?[98] That's really what is going to set Diridon Station apart from other station locations and from other transportation centers, certainly in California, absolutely in the US. So that's first and foremost: how do you make this connection seamless?*

In addition, managing the different modes converging at the station and identifying adequate space for each one of these modes is challenging. As noted by Frank Fuller:

> *With Uber, Lyft, taxis, public and private buses, the linear feet of available curb space along streets becomes a significant criterion for station planning. This subject did not arise in the Diridon Station Area Plan that began in 2009, but now there needs to be discussion about managing this phenomenon. In some downtown districts, the competition for street curb space has become intense, where all types of vehicles compete throughout the day. Often vehicle competition blocks access by pedestrians and bicycles. From the early days of the Station Area Plan, the Plan called for north-south curbs to be allocated for buses, taxis, and vehicle drop-off of passengers. One implication of this direction is that pedestrian and bike connections from the downtown to the east would be hampered. This aspect of the Plan will need to be studied further, including one alternative that was presented in the Station Plan which allocates curbs in the east-west direction within the street grid. Available curb space within the City streets has become a new issue because of the many new and different kinds of vehicles, which are not single-occupancy. Transportation vehicles have proliferated in the past few years, such as public buses, private buses from many different companies, private car services such as Uber and Lyft, as well as light rail, and bus rapid transit (BRT) within City streets. How to route the vehicles and manage curb space on streets around urban blocks has become a significant issue.*

Type of Alignment and Barrier Effect

The type of alignment of the tracks—underground, surface or aerial—influences the connectivity of the urban form and how the station relates to its surrounding area. At the time of this writing, CHSRA seems to have ruled-out the underground option. As reasoned by Tripousis:

> *We are fully analyzing an at-grade option and an aerial option for Diridon Station. The city and various stakeholder groups have also asked us to look at an underground station option, which really isn't feasible. There is a very high ground-water table, there's essentially an aquifer underneath the DS. Tunneling isn't a problem but constructing a station box the size of the Empire State building, roughly 150 ft. underground in order to accommodate a HSR station, is a significant challenge. You can probably engineer your way through it but the question will be "why?" and the cost is enormous.*

However, many view the aerial option with some trepidation. According Tolkoff:

> *We don't yet know if the high-speed rail tracks will be at-grade or aerial. I think there is a real concern that an aerial structure will be disruptive for the neighborhoods that surround it. On one side of the station you have more historic, lower density residential communities and on the other side is downtown. Whether or not high-speed rail is aerial, the station will need to be designed for maximum permeability.*

The third set of challenges are particular to the specific San Jose context and station location, and are as follows:

Car Dependency and Parking

San Jose is a very car-oriented city, and currently one out of three people access the station as solo drivers.[99] Transit mode shares in the city are significantly lower than in San Francisco. So even though there has been a concerted effort to discourage driving as an access mode to rail stations, many stakeholders worry about the provision of adequate amounts of both short- and longer-term parking options in the development of the station and its surrounding area. Exactly how much parking should be planned for, where it will be located, and in what form–surface parking lots or parking structures, concentrated or scattered–are important planning decisions that will have an effect on the urban form.

Currently, the station is surrounded by vast surface parking lots. These lots create barriers that separate the station from its adjacent areas and counteract visions for a pedestrian-oriented, vibrant space. However, eliminating this parking is challenging because of an agreement the City has made with the San Jose Sharks–National Hockey League, and because some transit operators also object to a reduction in parking.[100] As explained by Zenk:

> *We have an agreement with the Arena to maintain more than 3,000 parking spaces available for their use within 1/3 of a mile, and more than 6,000 spaces within half-mile. The Arena and City are therefore greatly concerned about how to meet our obligation when the surface lots go away due to BART, HSR, and station construction and area development. Our partners are also concerned about this - they need sufficient access (by all modes) to the Station and they understand that our downtown currently relies heavily on the Arena (many downtown businesses will tell you that they don't know they can survive without the Arena). So it is not a flippant issue.*

Proximity to San Jose's Mineta International Airport

Diridon Station is located in close proximity to San Jose's Mineta International Airport. Its location within the flight path means that Federal Aviation Administration (FAA) Airport height restrictions mandate FARs no higher than six 6:1 for some sections, while nearby areas with a Commercial Downtown designation allow FARs up to 15:1. As aircraft technology changes, however, these restrictions may change in the future. As argued by Tripousis:

Station area development is challenged by the FAA flight path issues… but I don't think that this insurmountable; I think that to an extent this is an artificial restriction. If the City and the partner agencies work with the airport and the airlines and the FAA, I think there is a way to overcome that. But even if they don't, there is a way of establishing densities, even if there are 12-story high-rises that take up the existing land uses in and around Diridon Station to create commercial and retail activity at the street level.

Limited East-West Connections

A strong spatial integration of the station and the downtown area is challenging because of the limited east-west connections, and the barriers formed by station tracks and the Guadalupe Parkway. As Zenk explained:

This is not a new station so we already have the barrier effect with the tracks to a significant extent, but the primary barrier between Downtown and the station is actually the highway, not the rail tracks; [it's] the 87 and the river underneath, though the river is a bit less of a barrier. I believe this contributes to stakeholder and community concerns about an aerial HSR station. We are particularly sensitive to it because of this existing terrible barrier just to the east, and we don't want that repeated. This was an important point when developing the Diridon Station Area Plan–that the project and the development of the station itself should help to knit back Downtown and this area. We already have limited east-west connections across, the opportunity to do significant station expansions, significant new development in the area, and change the transportation network in pretty fundamental ways. So other than the visual concern regarding the aerial alignment, mostly this is seen as an opportunity to address existing barriers.

The problematic east-west connections were also mentioned by Fuller:

The bridge for the railway that crosses West Santa Clara Street is old, narrow and constraining for motorists, pedestrians and bicycles. Several of the other railroad crossings near the Station, either under or over the tracks, will not necessarily be improved by the elevated high-speed rail system. Existing crossings have narrow passages, steep slopes, and are constricted in other ways, impeding easy biking and walking. Study is needed to improve rail crossings in order to connect the west part of the City with the Station Area and Downtown.

Lack of a Community Redevelopment Agency

A last challenge mentioned by several interviewees relates to the demise of the City's redevelopment agency in 2012. Such agencies in California allowed local governments to capture a greater share of property taxes through tax increment financing, which helped them purchase and consolidate land, turning it over for development. The termination of redevelopment agencies in California cities made it more challenging for the City to act as developer, purchasing and consolidating land and negotiating with private developers. As noted by Tolkoff:

It's good that a significant amount of land immediately surrounding the area is publicly held. But there are also some parcels that are in limbo because of the dissolution of the Redevelopment Authority. The city has been fairly limited in what it can do to consolidate land, due to fiscal constraints and the end of Redevelopment. A lot of the parcels are also privately held, particularly as you move further away from the station itself.

Opportunities

While interviewees believed that the aforementioned challenges should be considered carefully by the City, they also outlined three major characteristics of the Diridon station that can be characterized as important opportunities for its development: its location, multimodality, and availability of developable land in public hands.

Location

Location is extremely important in real estate development, and the location of the Diridon Station in San Jose and at the heart of Silicon Valley, in very close proximity to the city's downtown and its international airport, can be characterized as nothing less than prime. As Fuller mentioned:

San Jose has one of the smallest downtowns geographically in one of the largest United States cities. San Jose is the 10th largest US city, and one goal of the Diridon Plan is to allow the Downtown to expand into the Station Area. The Downtown should make the best use of the Diridon Station area, especially since the Diridon Station has the potential to be the major transportation hub for Northern California.

Diridon Station and the larger downtown should help San Jose play a central role in the economy of Silicon Valley and the larger region. It's an incredible possibility and establishing that idea from a state point of view, as well as a federal point of view, is of utmost relevance to the future of the City.

In that sense, the coming of HSR may help the City not only expand its downtown, but also realize its potential to climb up the urban hierarchy. As Tolkoff reasoned: "HSR is an opportunity for San Jose in a lot of ways. It allows San Jose to be more connected to the region but also the state, at a speed that overcomes the real or perceived distance*."*

Multimodality

Indeed, the station's connectedness and multimodality emerge as major assets for its development. Diridon Station is expected to have more modal connections than the Transbay Center, currently under construction in San Francisco. According to Tripousis, "The advantage at Diridon Station is that because HSR will be new, because the BART extension and the regional transit system connections coming to Diridon are going to be new, we have an opportunity to make these connections effective from day one." And as Fuller noted:

With high-speed rail and BART, in addition to other existing modes, Diridon would be the transportation center for half of the 6th largest economy in the world, the northern half of the State of California. Diridon Station and the larger downtown should help San Jose play a central role in the economy of Silicon Valley and the larger region. It's an incredible possibility and establishing that idea from a state point of view, as well as a federal point of view, is of utmost relevance to the future of the City.

While interviewees emphasized the opportunity of building greater connectivity between San Jose and other California cities, they also saw opportunities in strengthening the pedestrian and bicycle connections of the station, something that the City is already doing. As Zenk explained:

The Plan includes significantly improving a number of east-west routes for greater bike connectivity. The adopted plan names the area as explicitly pedestrian and transit -first. We have guidelines recently developed for "complete streets" that prioritize a good level of design for all users…. There are specific ways the City has considered to increase the station's multi-modality: In the past couple of years, we have done much enhanced bike lanes on San Fernando St., we have put in the bike share at the station, added the bike lockers which are all full, we also have a project along Park Ave that will connect an east-west bike way that goes all the way to the Santa Clara University. It will be mostly buffered, we are removing parking along parts of Park Ave... We are also building out the creek trails. These are all very critical north-south connectors primarily. I am convinced that we need the best in protected bike- and pedestrian-ways around the Station. It is already a significant portion of riders who are accessing the Caltrain station that way.

Such City efforts of connecting the station through alternative transportation modes have started to counteract San Jose's high dependency on automobiles. According to Fuller, "bicycle usage in San Jose and the Silicon Valley is increasing tremendously, week by week."

Availability of Developable Land

Another major opportunity for development around the Diridon Station area is the availability of unbuilt land, a good portion of it currently being under public ownership. As Zenk explained:

Caltrain Joint Powers Board has most of the properties in the core station area, including the station itself and the parking site proximate to it. A lot of the land immediately around the station is in public ownership. Some of it is owned by our redevelopment successor agency but that is not fully under our control; the Santa Clara County is part of the successor agency process… We have these seas of surface parking and there will be some growing pains perhaps while these transform, but ultimately they represent a huge opportunity. That is not our goal state. Our goal state is to have a dense, vibrant space where you don't walk through seas of parking. The opportunity is tremendous.

Prerequisites

Lastly, interviewees discussed the key issues or prerequisites that need to be in place to ensure the Diridon project becomes a success. Broadly speaking, they referred to four major prerequisites: 1) political leadership and commitment; 2) efficient governance structure; 3) planning for intermodal connections; and, 4) good design for creating a place.

Political Leadership and Commitment

A number of interviewees emphasized the importance of political leadership, commitment, and even advocacy to make this project happen. According to Fuller, "One essential item to realize the potential of the Diridon Station is advocacy from the top leadership in the City, and that means the City. The Mayor and the City Council need to agree and advocate implementation of the Diridon Plan as a high priority for the City's future." The same sentiment was echoed by Tolkoff: "There needs to be a commitment from everybody to make this a great station that has a bold impact."

Efficient Governance Structure

Interviewees have previously identified the project's governance as challenging, because of the multiplicity of stakeholders, and their various priorities and time frames. For these reason, they stressed the importance of an efficient and transparent governing system as a prerequisite for the project's success. As noted by Tolkoff:

> *There needs to be a group with a deliberate mandate and decision-making authority. It should be structured in a way that helps overcome the piecemeal decision-making that tends to happen when there are so many projects in motion.*

Planning for Intermodal Connections

The Diridon Station will be a major transportation hub, so the type, quality and seamless integration of its different modes and transportation connections is perceived as a major prerequisite for its success. As emphasized by Tripousis:

> *Certainly, the modal access and the modal connection is a very important requirement —the ability to connect to local and regional systems make it vitally important for a HSR service to make those kind of connections. The connection to Diridon Station and an effective connection to San Jose international airport or San Francisco international airport are vitally important not just to the local traveler but to the Central Valley traveler, because now by shrinking the space, by creating less than an hour train trip from Fresno to San Jose, somebody in Fresno can hop onto one of our trains and catch a national or international flight at Mineta that isn't available to them today, or is very costly. This builds up the opportunity for business at those respective airports, shrinks the state from a travel standpoint, and facilitates those trips. So if a Fresno or Bakersfield resident is going to Frankfurt, they are virtually in Frankfurt the minute they are on our trains. We have to find ways to make their trip seamless, accommodate their baggage, get them to the local people mover or transit system to*

get them into the terminal and facilitate their getting into their flight. So those modal connections are the game-changer, in my view, and add value to providing HSR to make these connections.

Such intermodal connections require pre-planning, and this was underscored by Tolkoff:

Another important issue to resolve is how the increase in rail service can be managed effectively. There are choke points and limits on capacity at and around Diridon. Conversations about how to ensure that there is sufficient capacity to move trains through the station from an operational and scheduling perspective should occur sooner rather than later.

Good Design for Creating a Place

Interviewees also discussed the importance of the right mix of land uses and good design, creating a vibrant place around the station, similar to what happens in a number of successful European HSR stations. According to Tripousis:

It should become an activity center beyond commute time. The last thing I would want to see is that Diridon Station becomes vibrant in the morning and the evening only, and is dead the rest of the time. We want it to be an activity center that is vibrant on a 24/7 basis, which will be quite a change for San Jose… The City has come a long way certainly from where it was 20 years ago; but it still has a long way to go from a density stand point, from the perspective of trying to have more around-the-clock activities and activity centers in the way that San Francisco or Los Angeles or New York City or Chicago have. It's got a long way to go, but it certainly has all the makings of that.

The importance of the right mix of land uses also including housing and the seamless integration of the station neighborhood with downtown and other adjacent neighborhoods, was also discussed by Fuller:

The preferred Diridon Station Area Plan included an American League baseball stadium. Currently, it is quite certain that the Area will not have a ballpark, and a concept without a stadium was presented as an alternative concept within the Plan. The resulting larger area should allow mixed-use development with mid-rise housing at urban densities, arranged in a framework of well-defined blocks and streets. A signature urban plaza should be included in the development, in front and to the east side of the Station. The plaza could have ground floor uses on all its frontages, which would carefully define the space, and should have vertical circulation linking high-speed rail, BART, the Station, and other uses. New housing could connect with the existing historical neighborhoods to the south and next to the Guadalupe Freeway, creating the Diridon urban neighborhood.

Diridon Station should not resemble an airport with parking structures in its immediate area; it should emulate stations that are integrated into a city's fabric and connected to their surroundings by all modes of transit. The Station should help define public spaces and streetscapes around it. New development near the Station should be infill

buildings, placed within the City's walkable blocks, not disrupting the city fabric. The Station and its development should strengthen the definition of streets, plazas, and other spaces that create the City's public realm.

For this seamless integration to happen, a number of interviewees talked about the desire to reduce the surface parking currently surrounding the station area, distribute it by creating a 'parking district,' and even take advantage of existing airport parking by connecting it through shuttles. According to Fuller, "Parking, with the exception of bike and disabled parking, needs to be located away from the Station. Vehicle parking should be dispersed within the city and at the airport, so it does not hinder development around the Station. One should not be able to park a private automobile next to the Diridon high-speed rail station, except if you are in a special kind of vehicle."

A similar argument was offered by Tripousis:

From the CHSRA's perspective, we are very much focused on dispersed parking, acknowledging that we should utilize parking within a 3-mile radius of the station. There's basically a 5-minute walk circle that we identified as part of our planning efforts to suggest that any parking capacity that exists within that 5-minute walk ought to be utilized for use at the station. Parking in our view is not the highest-best use of the land in and around a transit facility like Diridon Station. So whether it is through good shuttle connections or ground transportation or the ability to provide comfortable ped-access to the station from surrounding parking facilities, that would be our preference. At the same time the Mineta International Airport is 2.4 miles from Diridon Station. We believe that we can establish a strong shuttle connection by an effective bus-shuttle or in the future a people-mover connection to the airport. There are relatively new rental car facilities there that don't need to be replicated at Diridon; there is significant parking capacity at the airport that does not need to be replicated at Diridon; so we want to utilize those resources rather than rebuilding them in and around the station.

The importance of good design and iconic station architecture. as well as, good urban design that stitches the station to the surrounding urban fabric, was also discussed as important prerequisites for the project's success. As emphasized by Tripousis:

Good design solves problems. Starting with a facility that takes advantage of the opportunity to become an iconic structure from an architectural stand point. Taking the opportunity to design that facility in a way that is inviting, to create opportunities not just for effective transportation connections but also for connecting to the community, whether it's through a plaza or activity center in front of the station, connecting new development to the station itself, making active connections between the station facility and the existing SAP Center, finding a way to make sure that the station is directly connected to all the surrounding land uses, including the housing and the neighborhood that sits on the west side of the station proper itself.

Good design would be particularly important in the aerial station option to minimize the visual impacts of a facility that may stand 65-feet above the ground—an option that some interviewees did not favor.

This chapter synthesized recent and ongoing planning processes at Diridon and outlined the challenges, opportunities and prospects for good station-area planning, as discussed by four knowledgeable local actors. The report now turns to six case studies of successful HSR projects in Europe to understand how they have addressed and resolved similar issues and challenges in station-area development. The purpose of this exercise is to draw lessons for the Diridon Station.

IV. CASE STUDIES OF EUROPEAN RAILWAY STATIONS

San Jose is a city of one million residents in an urbanized area of 1.6 million, with the entire Bay Area housing about 7 million people. San Jose's area for development around the station is 240 acres. Downtown San Jose is a fifteen-minute walk from the station, with the need to cross under a major freeway.[101] The authors focused on finding examples of recent rail station redevelopment projects in European cities with similar demographic, economic and geographic characteristics. More specifically, the authors sought to identify examples of:

- medium-sized (with a population of 100,000-500,000) cities where new/enhanced rail connections spurred new development potentials for the entire city;
- where comprehensive station and station-area planning occurred in the last two decades;
- with a station located in walking distance to the city's historic downtown core;
- with enhanced multi-modal connections beyond just conventional rail;
- with significant areas of developable land around the station.

In looking for the most suitable examples, the authors had to consider a number of issues. First, European cities of comparable size to San Jose typically have much higher passenger volumes at their central rail stations, because rail transportation plays a much more important role in the European cities' transportation networks. Overall, population densities are also typically higher in many major European cities. And inevitably, the amount of real estate available for redevelopment near the various stations varies greatly, as does the timing of the various rail station redevelopment projects.

To identify relevant and useful examples, the authors used their knowledge of European rail stations, supplemented with extensive online searches and informal conversations with European rail experts. This led to the assemblage of an initial long list of twenty European comparison stations, all of which function as multi-modal hubs. At this stage of the research, the selected stations purposely exhibited a variety of sizes, geographical characteristics and population densities. Next, the authors compiled a short list of seven stations that were deemed most fitting comparisons for Diridon Station. Table 5 presents comparable information for these seven stations, while the summary profiles of all stations–with the exception of the five case studies–are presented in Appendix A.

Based on the recommendations of the study's advisory board, the authors selected Euralille, Lyon Part Dieu, Rotterdam Centraal and Utrecht Centraal for detailed case study analysis. The board also requested the authors include Turin Porta Susa as a fifth, more limited case study, assembling information mainly via desk research from secondary sources. Two other stations, Marseille's St. Charles and Amsterdam's Zuid, were dropped from consideration. In Marseille, the station's adjacency to the city's major port presented a complicating factor, while Amsterdam Zuid was deemed the least-relevant Dutch case

study of the three, due to its comparatively more remote location from Amsterdam's historic center, and also the fact that Amsterdam represents Holland's premier and capital city, which was not deemed comparable to San Jose.

In the case of the two Dutch stations of Rotterdam and Utrecht, one of the authors conducted in-person site visits in July 2016. The research on the two French cases, Euralille and Lyon Part Dieu, benefited from the fact that the authors had previously visited these stations, and research collaborator, Eidlin, had studied them in some detail during his German Marshall Fellowship in 2014. Additionally, two high-ranking French rail experts, Etienne Tricaud and Stephane de Fay, were able to visit San Jose and San Francisco as part of a series of Rail-Volution conference events organized by Eidlin, SPUR San Jose and the Mineta Transportation Institute (MTI). These visits enabled a unique direct personal engagement on the lessons from the French case studies, with some of the people who helped shape them. Lastly, the French and Dutch case studies benefitted from interviews with Frédéric Duchêne, Project Director for Mission Part Dieu, and Barend Kuehnen, Director of Retail and Services at Nederlandse Spoorwegen (NS) Stations–Dutch Railways.

Table 5. Comparative Information for Possible Case Study Stations

	San Jose	Euralille	Part Dieu	St. Charles	Rotterdam	Amsterdam	Utrecht	Turin
Population	1,000,000	200,000	500,000	850,000	610,000	835,000	330,000	900,000
Density per sq. mi	5,400	17,000	27,000	9,200	7,690	12,700	9,000	18,000
Daily transit riders	Expected CHSRA: 11,110 Masterplan 36,500 boardings 36,500 alightings	58,000	90,000	42,500	110,000	80,000	285,000	15,000
Area of development	250 acres	250-300 acres	332 acres	740 acres	50 acres	670 acres	225 acres	500 acres
Land uses	Expected: Office/ commercial-mixed use, retail, entertainment	Retail, office, hotel, residential Government offices	Office/ commercial retail	Mixed use Commercial Hotel Restaurants Institutional	Commercial Office Civic	Mixed use Office Retail Convention facilities	Retail Restaurants Hotel Civic	Mixed use Institutional
Distance from downtown	0.7 mi	Within	1.2 mi	0.5 mi	Within	3 mi	Within	Within
Development fully completed?	No	Yes	Yes	Yes	No	No	Almost complete	Almost complete

Source: OECD (2014); Terrin (2011); ULI (2010).

The following sections present in-depth case studies of HSR stations at Lille, Lyon, Utrecht, Rotterdam and Turin.

IV-1. LILLE-EUROPE

INTRODUCTION

Lille is a city in northern France and is the country's 10th largest with 230,000 people. After the plans for the British-French Channel Tunnel rail project were finalized in the late 1980s, Lille convinced Société nationale des chemins de fer français (SNCF), France's state-owned railway company, to locate an HSR stop next to its historic city center. To take advantage of the economic opportunities presented by HSR, and to help modernize the city's economy, the new station, 'Lille-Europe,' was developed as part of a master-planned area that included a commercial center, office towers, and a conference center. The station and redevelopment effort helped to transform the central city district. Lille is now located at an international crossroads, only one hour from Paris, 1.67 hours from London, 0.63 hours from Brussels, and 2.33 hours from Amsterdam (Figure 10).

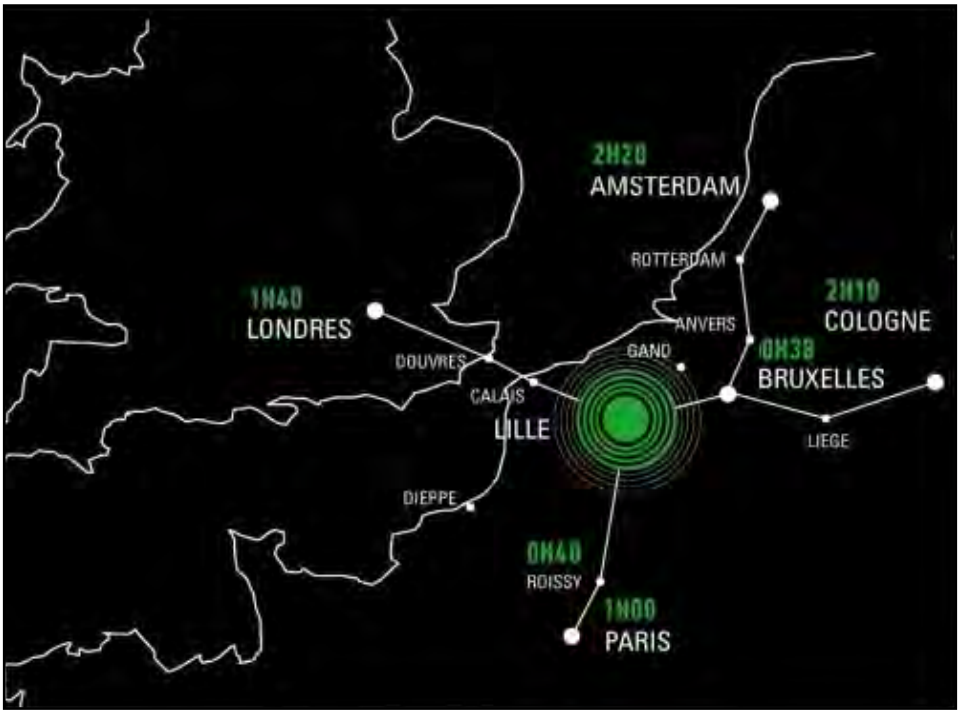

Figure 10. Lille as an International Crossroads

Source: Eidlin 2015b.

Table 6. Lille-Europe Station at a Glance

Region	
Location	Lille, France
Population	231,500 (Lille, 2013) 1.36 million (metropolitan area, 2014)
Population Density	17,200 per mi^2 (Lille, 2013) 2,430 per mi^2 (metropolitan area, 2014)
Station	
Location	Adjacent to historic city center
Type of Project	New development
Number of Transit Riders	7.07 million per year
Types of District Land Uses	Commercial, residential, hotel, office
Parking	6,100 spaces
Elevation	Station at grade[102]
Transportation Modes	High-speed rail, regional trains, metro, taxi, bus, trams, airport shuttle, car, motorcycle, and bicycle parking

Source: INSEE 2013, SNCF (*https://www.gares-sncf.com/fr*), OECD 2014, SNCF Open Data (*https://ressources.data.sncf.com*), Bertolini (1998).

STATION AND STATION-AREA

Neighborhood Context

The Lille-Europe station is located on former military land, adjacent to the existing rail station, Lille-Flandres, and a half-mile from the historic city center (Figure 11). The old station was deemed too small and too difficult to redesign to accommodate new HSR services. The state, thus, donated 250 acres of land formerly used as military base to the city to construct the new station.[103] Because of its location on a large, undeveloped parcel of land, the development was able to avoid the typical challenges of building in a dense urban environment, such as construction noise and historic preservation.[104]

Prior to the station construction, the urban fabric was split by a surface highway and rail lines running north-south. The neighborhoods surrounding the military land housed typical residential and commercial uses. According to Luca Bertolini and Tejo Spit, authors of *Cities on Rails: The Redevelopment of Railway Station Areas* (1998), “the general property dynamics was low, partly due to the many infrastructure barriers. The areas on the other side of the tracks and motorway were essentially residential and had little contact with the social and economic life of the city centre.”[105]

Figure 11. Aerial View of Lille-Europe, Lille-Flandres, and the Euralille Center in Relation to Downtown

Source: Eidlin 2015b.

Station Development

The building of the Channel Tunnel project and the emerging European HSR network in the late 1980s, provided an opportunity for Lille to boost its economy, which at the time, was primarily industrial and struggling. The Paris-Lyon Train à Grande Vitesse (TGV) network–France's HSR system, was completed in the early 1980s, and because of its success, began spurring other network and station-area improvements. The UK and France agreed to build the Channel Tunnel in 1986, and France, Belgium, Germany, and the Netherlands all further advanced HSR across North-West Europe. Pierre Mauroy, the mayor of Lille at the time, led a group of both public and private entities to lobby for the train to run through Lille instead of farther south in the Picardy Region.[106]

Construction on the entire project, including the new business district Euralille, began in 1987. Construction on the Lille-Europe station started in 1990 and was completed in 1994 (Figure 12). By 1994, the new Euralille district and Lille-Europe station were inaugurated, and the first Lille-Brussels TGV ran in 1995.[107] The station district included the following transportation projects: TGV line and station, metro underground line and station, rapid-tram stop, underground parking, a motorway bypass next to the TGV line, and a road viaduct.[108]

Figure 12. Aerial Photograph of the Euralille Construction Project

Source: OMA (http://oma.eu/projects/euralille).

Station Basics

The station is an international HSR hub between London, Brussels, and Paris, but is also well-connected to the regional and metropolitan transportation systems, including the metro, trams, and bus network. Travelers can also easily access the station by car from the motorway bypass, and the station includes extensive underground parking.[109] The station's ridership has grown substantially over the twenty years since it was constructed. In 1995, almost three million annual passengers travelled through Lille-Europe.[110] By 2014, more than double that amount traveled through the station (Table 7). Lille-Europe does have a smaller ridership than Lille-Flandres, which saw 18.5 million passengers in 2014.[111]

Table 7. Basic Lille-Europe Station Facts

Number of tracks	4 tracks, 2 platforms
(Table 9) Number of Travelers	7.07 million
Number of Users (travelers and non-travelers)	11.2 million

Source: SNCF Open Data (*https://ressources.data.sncf.com*).

Station-Area Basics

The Lille-Europe station was constructed as part of a larger master-planned area between the old and new stations called 'Euralille 1' (Table 8). This mixed-use district is made up of three main parts:[112]

1. Cité des Affaires, which includes the Lille-Europe station and two towers built above the station. The towers contain offices, restaurants, business services, exhibition rooms, shops, a hotel, and parking (Table 9).

2. Euralille Center, a multi-use center that connects Lille-Europe and Lille-Flandres. The center includes shopping, restaurants, event space, leisure accommodations, an international business school, public and private services, a hotel, housing–both temporary and permanent, and parking (Table 10).

3. Grand Palais Congress Center, a 194,000 square-foot conference center.

The project also includes an almost twenty five-acre park, a regional municipal building, additional housing units, and offices for the European Foundation of the City and Architecture.[113]

Table 8. Area Use Breakdown of Euralille 1

Area surface	173 acres
Area ownership	SPL Euralille (city of Lille)
Total floor space	2,946,000 ft²
Offices	492,000 ft²
Private services	240,000 ft²
Congress/exhibition space	409,000 ft²
Permanent housing	68,700 ft² (168 units)
Temporary housing	121,000 ft² (407 units)
Leisure	168,000 ft²
Shops	334,000 ft²
Hotel, restaurants, cafes	200,000 ft²
Education	1,324,000 ft²
Public services	43,000 ft²
Foundation for Architecture	91,500 ft²
Parking	6,100 spaces

Source: Bertolini (1998).

Table 9. Area Use Breakdown of the Cité des Affaires

Offices	428,000 ft²
Restaurants, business services, exhibition rooms, and shops	17,000 ft²
Hotel	112,000 ft² (200 rooms)
Parking	35,000 ft² (1,370 spots, 250 reserved for station use)

Source: Bertolini (1998).

Table 10. Area Use Breakdown of the Centre Euralille

Shopping	334,000 ft²
Leisure accommodations	5,964,000 ft²
Event space	23,700 ft²
International Business School	200,000 ft²
Food services	56,500 ft²
Public Services	43,000 ft²
Housing for sale	68,600 ft² (168 units)
Temporary Housing	121,000 ft² (407 units)
Hotel	25,300 ft² (97 rooms)
Private Services	62,700 ft²
Parking	878,000 ft² (3,500 spaces)

Source: Bertolini 1998.

Euralille 2, a fifty-four-acre extension developed in the mid-2000s, primarily serves as a hub for the Nord-Pas-de-Calais-Picardie regional government. The development also includes public facilities, green space, offices, and primarily low-rise housing. 'Euralille 3,' which is currently being developed, will include offices, housing, shops, and public areas.[114]

THE PLANNING PROCESS

Station and Station District Planning

From the beginning of the planning process, Lille envisioned the station as part of a much larger redevelopment project. A public-private partnership, Euralille-Métropole, was tasked with evaluating the feasibility of a new urban development project and HSR station. Instead of redeveloping Lille-Flandres, Euralille-Métropole recommended the building of a new station[115] and developing a mixed-use project between the two stations with offices, services, shops, cultural facilities, housing, public facilities, and park space.[116] The partnership asked architects to develop concepts for the project, and selected the design by OMA and Rem Koolhaas, because, "he had a vision of the city not just of a project."[117]

After negotiations with SNCF, other transport companies, and the metropolitan government, the city council approved the project in 1989. Euralille-Métropole began looking for private investors for each part of the development.[118] Once the project was approved by the metropolitan government, Euralille-Métropole became a public-private development partnership called 'Société d'Économie Mixte' (SEM) Euralille.

Primary Actors

According to Bertolini, the Euralille 1 project was, "a mixture of smaller projects funded by private investors within a master plan defined by the public sector and coordinated by a nominally mixed, though public sector-controlled, management agency." Seventy percent of the funding for the project came from private sources, with only twenty-one percent from the public sector, and nine percent from semi-public sources.[119]

The first management organization was a public-private development partnership called Euralille-Métropole, which included banks, SNCF, and the local Chamber of Commerce. The plan was developed and approved by the local and metropolitan governments under this public-private partnership. The partnership chose OMA and architect Rem Koolhaas to develop the masterplan. This design team developed the station area plan, station design, and transportation infrastructure,[120] and managed the development process.[121] A public-private agency, SEM Euralille, was created with a commercial status.[122] More than fifty percent of the shares were publicly owned, and the remainder was held by banks, the Chamber of Commerce, and SCETA–a subsidiary of SNCF.[123] SEM Euralille was granted authority in the special development zone for fifteen years and oversaw the station and the station district development.[124] In 2011, SEM became a Société publique locale ("SPL"), in which only public agencies are shareholders. Called 'SPL Euralille,' the metropolitan and commune government each holds about thirty percent of the company's capital.[125] SPL Euralille is a private entity whose shareholders are all public–the cities in the Lille region, each of which has a stake that is roughly proportionate to its population. Today, SPL Euralille owns the station district. Réseau Ferré de France and SNCF own the station itself.

Euralille-Métropole and SEM Euralille both looked for private investment for the individual parts of the project. The World Trade Center, Credit Lyonnais tower, Centre Euralille, and Lille Grand Palais were all separate, independent projects. The masterplan for the project did not have a fixed land-use mix, and so private funders were able to alter the program to their preference. For example, investors asked to decrease the amount of office space to reduce investment risk.[126]

According to Terrin, there were four key players in the station and station district project.[127] The first is Pierre Mauroy, mayor of Lille for twenty-five years, president of the metropolitan government, and the French Prime Minister in the early 1980s–critical years for the Channel Tunnel and European HSR expansion projects. Mayor Mauroy's lobbying was key in influencing SNCF's decision to bring HSR to Lille, and in bringing both the public and private sectors together to agree on a vision for the station.[128] Mayor Mauroy was involved in Euralille-Métropole and presided over SEM Euralille.[129] The other three key players were Rem Koolhaas of OMA, who was responsible for the project design, Jean-Paul Baietto and his successor Jean-Louise Subileau, directors of SEM Euralille. Today, the main and most powerful decision-maker is the Executive Director of SPL Euralille–Directeur General.

Planning Challenges

The first challenge the Euralille project faced occurred at the beginning of the planning process, when both the surrounding local governments and SNCF opposed having a HSR train run through the center of Lille. The local governments surrounding Lille were worried that they would be negatively impacted by the rail, and that Lille would receive all the benefits. To address the local governments' concerns, planners ensured that large cities in the region would receive shares in the project and redevelopment projects of their own.[130] SNCF was concerned about the extra cost, estimated at 800 million Francs, to develop a station in a city center, instead of the countryside. To solve this, Mayor Mauroy proposed the development of adequate amounts of commercial space that would generate taxes, and could cover the additional development costs. This spurred the idea to develop not just a station, but an entire master-planned area and business district.[131]

Once the station location was settled and the basic concept of the project developed, stakeholders from both the public and private sectors were concerned about the proposed program mix. Small retailers in the historic city center area worried they would be put out of business by the large, new development. In order to address these concerns, the amount of shopping floor space was reduced by half–from approximately 700,000 to 334,000 square-feet, and policies intended to reduce competition between Euralille and the small retailers were enacted. These policies included ensuring that Euralille retailers offered specialized products, and that thirty-seven percent of the shopping floor area was reserved for local businesses. Private sector investors were concerned that an overly high office ratio increased the project's risk. Thus, the mix was adjusted to mollify investors.[132]

The third major challenge was the difficulty SEM Euralille had in financing the project, ensuring use of both public and private funds. The basic elements of Euralille Phase I were implemented by 1997. However, some elements were delayed, due to lack of adequate funds, and much of the proposed office space was never built, due to the real estate crisis in the mid-1990s.[133] Only two of the six originally planned Cité des Affaires skyscrapers were constructed.[134]

STATION LAYOUT, ARCHITECTURE, AND USES

Station façade

The Lille-Europe station building was designed by Jean-Marie Duthilleul in a contemporary style, and is made of lightweight concrete, windows, and wood (Figure 13). The station is at-grade level, since Koolhaas, "advocated for a landmark station that would be visible," instead of one underground.[135] The roof is made out of wave-shaped metal, and a two-story glass façade, called the "window on HSR," separates the train platform and the plaza (Figure 14). Above the station building, one of the skyscrapers shaped like an 'L' or ski boot has become iconic.

Figure 13. Lille-Europe Station Interior

Source: OMA (http://oma.eu/projects/euralille).

Figure 14. The "Window on HSR"

Source: Eidlin (2015b).

Station Uses

The Lille-Europe station was designed to primarily serve travelers. The station's retail includes a post office, pharmacy, money exchange, restaurants, bars, cafes, and newspaper/book shops. The station also provides specific travel services: a luggage facility, trolleys for moving luggage, a waiting room, and a salon grand voyageur. All Eurostar travelers go through security checks and passport control.[136]

Station-District Integration

The planners, architects, and designers made a concerted effort to connect the station with the rest of the station district and city. For example:

- The Cité des Affaires towers are constructed on top of the station;
- A pedestrian boulevard, rue et Viaduc Le Corbusier, connects the Grand Palais and Euralille; and,
- The Euralille Center serves as an important pedestrian connection between the two stations, and is considered to be the heart of the district.[137]

However, not all of the connections were successful. According to Eidlin, "the vast plaza located between Lille-Europe and the Euralille shopping center, Place François Mitterrand, feels barren and sparse, perhaps even unfinished. Similarly, the large Parc Henri Matisse that is adjacent to this public square feels amorphous and…poorly used."[138] One reason for the lack of use may be that the shopping center faces inwards, rather than encouraging pedestrians through the development of outside amenities.[139]

The connection between the station and the surrounding area was also not entirely successful. According to Jan Jacob Tripp, author of the essay "What makes a city: Urban quality in Euralille, Amsterdam South Axis and Rotterdam Central," there is a, "feeling that Euralille

is a barrier between the inner city of Lille and the neighborhoods beyond the ring road."[140] Potential visitors have difficulty reaching Euralille from the neighborhoods to the east.

Wayfinding

SNCF has standardized signage in all its stations. Euralille has struggled quite a bit with the legibility of Place Francois Mitterand and the pedestrian connections between Lille-Flandres and Lille-Europe.[141]

Parking

There are 6,100 parking spaces in Euralille as a whole, and three accessible parking lots used by Lille-Europe travelers.[142] There are two car garages near the station–814 and 1,095 spaces–and one accessible from the station itself–3,216 spaces. The station has twenty-nine kiss-and-ride spots, and the first twenty minutes are free.[143] Other private motorized vehicle options include: car rentals (four companies in the station), car share (across from station), and taxis (on Leeds Blvd). In addition, the planners designed spaces specifically for bicycle and motorbike parking, and there are three bike share stations in Euralille (Figure 15).

Table 11 lists the parking costs in 2016.

Table 11. Cost of Parking in Euralille

15 minutes	€0.80
1 hour	€1.90
8 hours	€15.20
24 hours	€24.50
Monthly	€160
Annually	€920

Source: SNCF (*https://www.gares-sncf.com/fr*), autocité (*http://www.autocite.fr/parking/lille/*).

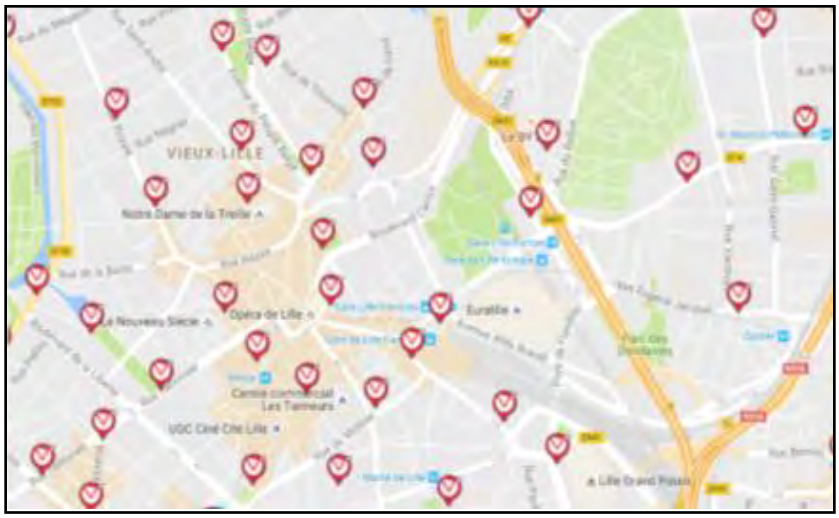

Figure 15. Map of Bike Share Stations in Euralille

Source: Transpole (http://www.vlille.fr/).

STATION MODAL INTEGRATION

The station is designed as a multi-modal hub and is intended to help connect train trips between the two different stations (Figure 16). Lille-Flandres serves TGV to/from Paris and the InterCity to Belgium. Lille-Europe serves TGV between Paris, London, and Brussels, and other French cities.[144] Additional transportation options include: five bus lines from the Viaduct Le Corbusier, two metro lines from the station itself, two tram lines, an airport shuttle, and coach services.[145] Two metro lines are directly accessible from the station.[146]

Ticket Integration

The metro between Lille-Europe and Lille-Flandres is free for passengers with an SNCF ticket.[147]

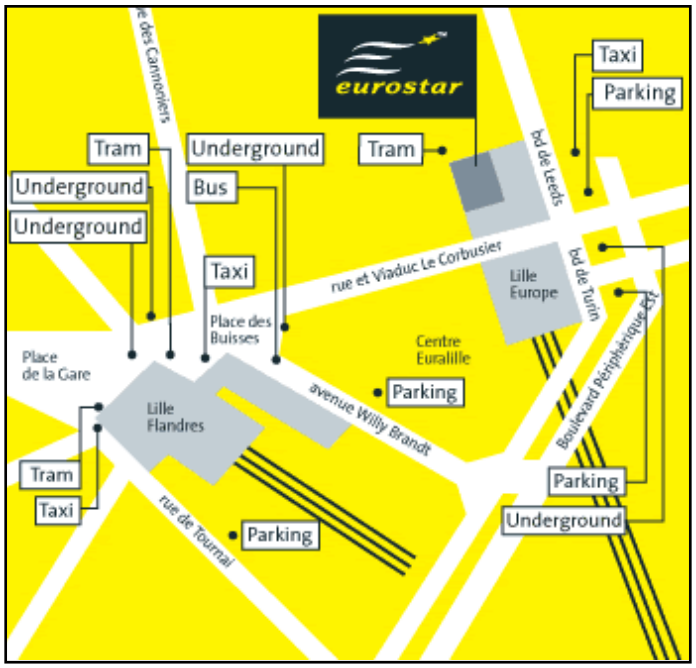

Figure 16. Multi-Modal Connections in Euralille

Source: Railplus (https://www.railplus.com.au/eurostar/faqs.htm).

EVALUATION AND LESSONS LEARNED

The main goal behind the building of Euralille and the station was to take advantage of Lille's newfound proximities to major European cities, and revitalize its economy by attracting economic activities, forming a, "cluster of high-valued service industries, commerce and leisure."[148] In many ways, the project achieved these ambitious aims.

The construction of the Lille-Europe station has had a significant impact on the entire city. According to Terrin, the, "Euralille district is now one of the city's central districts."[149] Along with providing the impetus for the entire Euralille 1 project, the district was expanded in the mid-2000s with the Euralille 2 project, and is currently undergoing further expansion with Euralille 3. Other expansion projects directly spurred by the station and Euralille 1 project include the redesign of Rue Faidherbe, now called Rambla, to improve the connection between the historic city center and Euralille; the expansion of the Saint Maurice neighborhood, to the east of Euralille, with offices and residential uses; and, the ongoing development of the Chaude Riviere neighborhood to the south, which includes a hotel and casino complex.[150] However, the historic core received more benefits from the station than did the Euralille district.[151] Overall, the Lille-Europe station has spurred redevelopment in the area directly surrounding the station and, "many public and private investments were attracted to the inner city," in general.[152] However, there are fewer private sector and more public sector office tenants in the station district than was initially envisioned.

On a broader scale, the Lille-Europe station has had profound impacts on the entire city of Lille. According to an interview with Phillipe Menerault, a planning academic and HSR expert from Lille, "Lille and the Lille region had benefitted enormously from HSR and from the Euralille master planning effort. The steep economic decline that gripped the city

and surrounding region in the 1980s and early 1990s has been reversed, in large part because of the introduction of HSR and the Euralille project."[153] Lille is now considered a modern economy that includes a service sector.[154] In 2009, for example, the largest growth industries in the region were tourism, communication, and international services.[155] International HSR travel is valuable to businesses, and there is now an equal amount of Parisians that commute to Lille as from Lille to Paris.[156] Euralille has also been important symbolically for the city. According to Trip, "the project has significant symbolic value, contributing much to the image and self-confidence as a modern city, and its position as a centre for shopping and tourism."[157]

The Lille-Europe station and Euralille project provides some important lessons for San Jose Diridon:

- The project benefitted from strong political leadership and a long term and practical vision that were both critical to its success.[158] In this case, Mayor Mauroy understood the importance of good urban design, was willing to take risks, and developed a strong alliance with both public and private stakeholders.[159]

- The project planners were able to gain support from SNCF and regional municipalities by providing compensation for perceived economic losses caused by the development. The public sector helped provide compensation for SNCF to realign the railway tracks, and build the station at the city center, instead of a peripheral area.

- The project planners, while establishing a firm project concept, remained flexible on the exact land-use mix of development. According to Bertolini, having a, "collection of independent and manageable projects implemented by autonomous agencies… allowed it to respond to changing economic and political circumstances."[160]

- The involvement of banks in the Euralille project was very important, as they helped the project survive an economic downturn.[161] At the same time, the strong public sector involvement helped minimize investment risks and attract private investment.

- The development of a landmark building and the recruitment of a star-architect to spearhead the project brought global attention to Lille-Europe.

In the end, the coming of the HSR to Lille and the associated station-area development had a catalytic effect for Lille, transforming it from a struggling industrial city to a modern center of the new economy.

IV-2. PART-DIEU STATION

INTRODUCTION

Lyon is a city of about 500,000 people in southeast France, and is France's third-largest city, after Paris and Marseille[162] (Figure 17). Starting in the 1960s, Lyon began planning a second employment district, east of the historic city core and Rhône River, called 'Part-Dieu.' The metropolitan planning agency later proposed building a train station, and SNCF–France's state-owned railway company–opened the multi-modal Part-Dieu Station in 1983, as a central regional transit network hub that accommodates HSR.

Both the Part-Dieu district and station have been very successful. The station is the busiest transfer station in France. The number of passengers using the station–about 120,000 travelers daily–has far outgrown the passenger capacity it was designed for, as travel from Paris to Lyon by HSR is now more common than air travel. The district as a whole is now one of the most important business districts in the country.[163]

The district and station are currently undergoing a major redevelopment effort in order to fully capitalize on the district's development potential, and better accommodate the increased ridership. The station and surrounding public space are being expanded and redesigned in order to better serve passengers, and improve station services and station connectivity to the district. The project is in the final stage of design, with construction scheduled to start in 2017 through 2022.[164]

Table 12. Part-Dieu Station at a Glance

Region	
Location	Lyon, France
Population	500,715 (city) 2.2 million (metropolitan area, 2014)
Population Density	6,700 per mi^2 (Lyon, 2014) 1,400 per mi^2 (metropolitan area, 2014)
Station	
Location	East of the historic core (separated by the Rhône River)
Type of Project	New development / Redevelopment
Station Size	165,000 ft^2
Transit Riders	120,000 daily
Types of District Land Uses	Office, residential, hotel, services, retail
Parking	2,060 (serving the train station)
Elevation	Station is at grade, tracks are elevated
Transportation Modes	Trains (HSR and non-HSR), bus, tram, trolleybus, metro, car share, car rental, taxis, parking

Source: OECD (2014), Eidlin (2015a).

Figure 17. Part-Dieu Station in Relation to its Surroundings

Source: Eidlin (2015a).

STATION AND STATION-AREA

Neighborhood Context

The Part-Dieu district is built on former military land, adjacent to the historic city core on the east side of the Rhône. Before construction, the Part-Dieu district was characterized by small-scale industrial and residential developments, and was losing population and businesses.[165] The area was surrounded by wealthy residential areas to the north and west, a commercial and administrative district to the west, and a lower income industrial area to the south (Figure 18).[166]

The station was built in this district instead of the historic city core for two reasons: 1) the historic core is located on a peninsula between the Rhône River and its tributary, and is densely populated, which constrained new development;[167] and, 2) Lyon-Perrache, the main train station in the city at the time, was not designed to accommodate train traffic in both directions, and would have been difficult to redesign.[168]

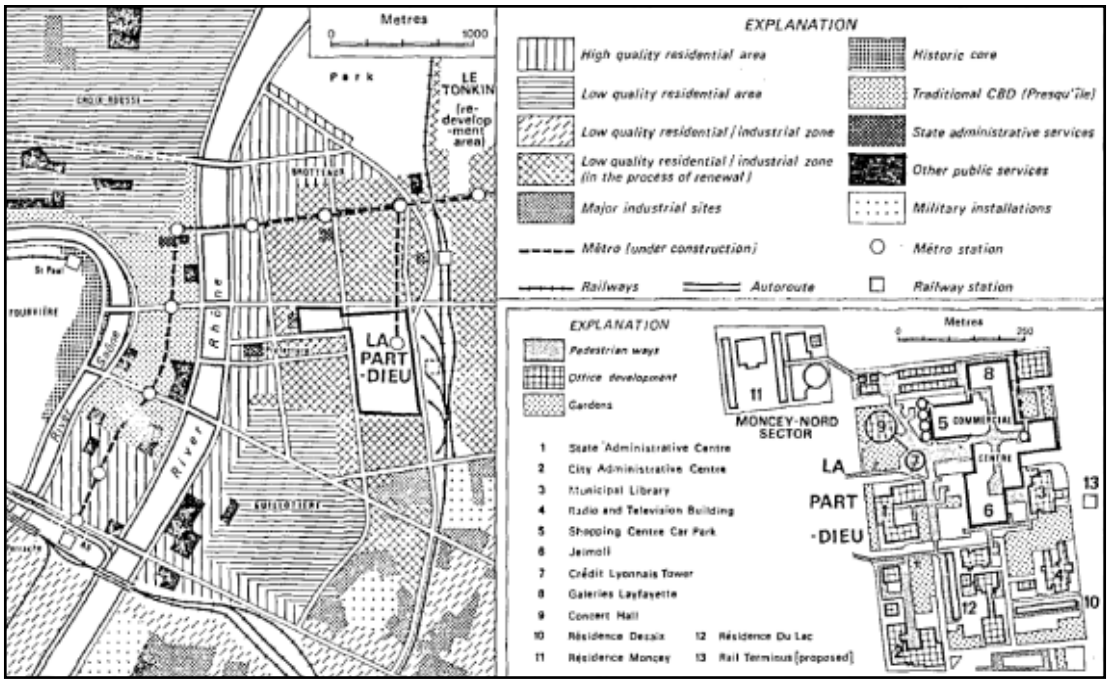

Figure 18. Map of Original Neighborhood Prior to Development of Part-Dieu (1970s)

Source: Tuppen (1977).

Station Development

The City purchased the military land in the late 1950s with plans to develop a second city center containing cultural, office, and residential uses.[169] National policy at the time encouraged these and similar developments across France to help counterbalance the centralized power of Paris.[170] Grand Lyon, the metropolitan area government, later suggested developing a train station in the district, and in 1978, SNCF Gares et Connexions began construction on the station.[171] The station opened to travelers in 1983.

Station Basics

The Part Dieu Station "is at once the main nodal point in Lyon region's public transit system and the busiest train station in France for connections."[172] Because station planners underestimated the demand for travel, the station was designed to accommodate only 35,000 passengers daily. The station now sees approximately quadruple this number of travelers daily.[173]

The planned station redevelopment intends to better integrate the station into the urban fabric and ensure that it can accommodate more travelers. According to the metropolitan government, the station will be a "large square with multiple accesses, an area for businesses and services, and a place of welcome that encourages interaction."[174] As indicated in Table 13, the plan for the station intends to:

- Double the amount of floor area;

- Relocate shops and services from the main station hall into lateral galleries;
- Increase the visibility of the station from the Boulevard Vivier Merle, which runs along the west side of the station, by removing the building located in the plaza outside of the station; and,
- Better distribute multi-modal connections along the roads that run parallel to the station and throughout the entire district.

Table 13. Part-Dieu Station Basic Facts

	Current	Projected
Area	165,000 ft^2	355,000 ft^2
Travelers Daily (all modes)	120,000	220,000 (by 2030)
Tracks	11	-
HSR Trains Daily	150	-
Conventional Trains Daily	400	-

Source: Eidlin (2015a), Duchene (2016), La Métropole de Grand Lyon (2011).

Figure 19. Part-Dieu Station, View from Above

Source: Eidlin (2015a).

Station-Area Basics

The Part Dieu district, the largest business district in the city and one of the largest in France, contains a massive shopping center with 1.4 million square-feet of retail space, a large government office complex, and the tallest skyscraper in the region–called,

"Le Crayon." Approximately 45,000 people are employed by 2,200 businesses in the district, primarily in the service sector, and about 5,000 people live in the district.[175]

The current station area redevelopment intends to promote development and increase density in the district by adding office and commercial space for a greater variety of companies (Figure 20, Table 14). The planners also believe that the district should be active at all times of the day and week, and want to encourage people to not only work, but also live there. The plan hopes to enhance livability by improving public spaces, adding leisure activities, and ensuring that new developments are mixed-use.[176]

Table 14. Existing and Proposed Part-Dieu District Statistics

	2013	2030 (planned)
Acreage	334	-
Residents	5,000	7,150 (+2,150)
Housing units	3,500	5,000 (+1,500)
Parking spaces	7,500	-
Office space	10.8 million ft^2	17.8 million ft^2 (+ 7 million ft^2)
Jobs	45,000	70,000 (+35,000)

Source: Eidlin (2015a), La Métropole de Grand Lyon (*http://www.lyon-partdieu.com/lexperience-lyon-part-dieu/chiffres-cles/#.V-be3vkrKUk*).

Figure 20. Proposed Redevelopment of Station District

Source: Eidlin (2015a).

THE PLANNING PROCESS

Station and Station District Planning

The City hoped to attract cultural, office, and residential development to the original Part Dieu district, and while a HSR station had been proposed, SNCF was originally against the idea. Charles Delfante, director of the urban planning department in Lyon, first envisioned a single project. However, after the initial building complex was constructed, the project was broken-up into individual tracks and "allotted" to separate public/private organizations. Each property after that was designed and managed differently.[177] Many of the planned cultural uses were never built. By the time SNCF agreed to build the station, many of the office buildings constructed in the early- and mid-1970s faced away from the train station site.[178]

A redevelopment process began in 2009, when Grand Lyon and the City of Lyon brought together a design team and a variety of other specialists to develop a plan for the redesigned district. According to a publication by Grand Lyon about the redevelopment project, the goal of this project, led by Grand Lyon, was to, "build a powerful economic core for the city, a large European business district that will also be a place for living, enjoyment and travel with the possibility of meeting other people and creating a symbiosis between the different urban functions."[179]

Primary Actors

The City of Lyon originally led the master planning effort for the Part-Dieu district, although the private sector led most of the real estate development. SNCF, which owns the station, was responsible for planning and developing the station itself.

Redevelopment of the station area is currently managed by SPL Lyon Part-Dieu, formerly Mission Part-Dieu.[180] There are ten people on SPL's board of directors, which is chaired by the president of Grand Lyon.[181] SPL works on planning, economic development, branding, public outreach, and marketing for the district. SNCF, SPL, Grand Lyon, the city's transit agency Sytral, the City, and the regional government all signed agreements determining how the redevelopment project would be financed. The primary public-private partnership was with the developers of the "Two Lyon" project, a proposed development located in front of the station.[182]

Overall, Gerard Collomb, president of the region's metropolitan governance entity, Grand Lyon, provided key political backing for the project and helped bring together the design team. Neither Grand Lyon, nor the City, own much of the land in Part-Dieu. These agencies are therefore required to use planning regulations to encourage the desired urban design and the development of partnerships.[183]

Planning Challenges

According to Frederic Duchêne, project director at SPL, the biggest challenge in planning the redevelopment of the station district is financial, and it is important for the City to identify new funding and new partnerships for the project. At the same time, urban integration of the

station into its surrounding district is a physical challenge, but also a necessity. Duchêne indicated that strong political support was necessary at first, given the numbers of partners that had to be convinced. These challenges were overcome by an urban planning team at SPL that integrated all the needed expertise–technical, architectural, economics, cultural, communication, engineering, etc., and was led by a strong manager to accomplish the best "Maîtres d'Oeuvre" possible.[184]

STATION LAYOUT, ARCHITECTURE, AND USES

Station Façade

The tracks of Part-Dieu Station are located one level above grade and accessed via escalators. The remainder of the station is at-grade, functioning as a concourse under the tracks. There are eleven platforms and eleven tracks. Under the redevelopment plan, the retail space at ground level will be moved to galleries flanking the station parallel to the tracks to increase pedestrian flow, a new entrance will be added along Pompidou Avenue–to the south, and overall the building will double in size.

Station Uses

The Part-Dieu station is designed to serve both travelers and non-travelers. Jean-Jacques Terrin, author of *Gares et Dynamiques Urbaines*, estimates that one-third of the users are traveling long distance, one-third are regional travelers, and one-third are locals who are not traveling.[185] Traveler services include luggage storage, a waiting area, a grand salon for passengers, an area for young travelers, and an area for people with disabilities.[186] There are currently no security checkpoints in the station, but they are being considered for the redevelopment.[187] The station also includes shops, restaurants, bars, and newspaper/book stores. The new station master plan aims to significantly increase the number and variety of retail offerings.[188]

Station-District Integration

The Part-Dieu station district is mostly automobile-oriented, has poor pedestrian connections, and fails to be both legible and transparent to users. The original autocentric design separated pedestrian and vehicular circulation (Figure 21). According to Eidlin, the development was "sliced up by depressed roadways, parking garages, and the boxy and opaque Part-Dieu shopping center."[189] Pedestrians walked on elevated walkways, making the surface areas under the walkways "feel deserted and unsafe," and there were few landmarks to help orient the user.[190] Many surrounding developments faced away from the station, as the station was not in the original master plan for the district.[191]

Figure 21. Depressed Arterial, Rue Servient that Connects the Historic City District and Lyon Part-Dieu

Source: Eidlin (2015a).

Overall, the district–prior to the redevelopment–"was not well-integrated into the city and poorly linked to the historical center."[192] The station and station-district are separated from the surrounding neighborhoods by what Duchêne considers three main urban "fractures":[193]

1. Rail track right-of-way, which restricts east-west travel.

2. Part-Dieu shopping center next to the station, designed contrary to the master plan design on a north-south axis. This orientation blocks the east-west flow of pedestrians from the station, and the architecture in general is considered to be "boxy and opaque."[194]

3. Garibaldi Street, a high-speed arterial that separates the district from the city to the west.

The station does, however, unintentionally function as an east-west pedestrian bridge between neighborhoods across the tracks. Almost 15% of those who pass through the station–approximately 20,000/day–are using the station solely as a pedestrian connection.[195]

The redevelopment of the station is intended to change how the station connects to the rest of the district. Francois Decoster, chief architect and master planner for Lyon Part-Dieu redevelopment, sees the key concept for this redevelopment as, "la gare ouverte," or, "the open station."[196] The redevelopment plan proposes increasing the number and ease of use of pedestrian connections through the station and district, and moving these connections to the ground level.[197]

Wayfinding

SNCF has standardized signage for all its stations, but the redevelopment hopes to incorporate smart city technology to communicate with travelers. This will include new signage, interactive terminals, mobile apps, etc., that provide real-time information to users.[198]

Parking

There are 2,060 parking spaces at the train station (see Table 15 for a parking cost schedule) and 3,056 in the shopping mall, with 7,584 underground parking spaces in the Part-Dieu district in total.[199] Surface kiss-and-ride spots are available for travelers. These are free for the first twenty minutes and cost €0.40 every two minutes beyond the first twenty.[200]

Table 15. Cost of Underground Parking at Lyon Part-Dieu

Up to 4 hours	€0.60 every 15 minutes
More than 4 hours	€0.30 every 15 minutes
24 hours	€20.40
Weekend	€28
Holiday Package (8 days)	€60

Source: LPA (2016).

SNCF also provides bicycle parking in the plazas outside the two station entrances.[201] Less than two percent of trips to the Part-Dieu district are taken by bicycle, even though planners would like to increase this proportion to ten percent by 2030.[202]

STATION MODAL INTEGRATION

As the primary public transit hub in the Lyon region, the Part-Dieu station is considered the gateway into the city.[203] The station is also considered the most important station in the SNCF network for connections. The station acts as both a HSR and regional rail station, and connects with Germany's regional HSR Intercity and France's TGV.

Only seventeen percent of travelers access the station via private car (Table 16). Travelers can access a variety of public transit services that stop within a half-mile radius of the station (Figure 22). The majority of these connections are within a five-minute walk of one of the two station entrances, but none is directly integrated within the train station. These include:

- Eleven bus lines;
- Four tram lines, a type of light-rail. One of these lines provides access to the Lyon Saint-Exupéry Airport and opened in 2010;[204]
- Three trolleybus lines;
- One Metro line;

- Bike share;
- Car share and rental; and,
- Taxis and chauffeured rental vehicles.

The Metro line, with an entrance directly outside the west station entrance, and the tram lines, with tracks that run at-grade directly to the east of the station, are the closest to the station.

Table 16. Intercity Rail Traveler Mode Split to Access Part-Dieu Station

Transit	40%
Walk	35%
Car	17%
Taxi	5%
Bike	3%

Source: La Métropole de Grand Lyon (*http://www.lyon-partdieu.com/lexperience-lyon-part-dieu/un-territoire-de-projets/gare-ouverte/#.V-U9_SiLSUk*).

Ticket Integration

While travelers must purchase separate tickets for regional trains and local public transit services in Lyon, the transit providers do offer an integrated payment smart-card called “la Carte OùRA” for those in the Auvergne-Rhône-Alpes region of the country and Switzerland. Users can load all of their subscriptions, including those for TER, TCL–Transports en commun Lyonnais, Lyon’s public transit system, parking, and bicycle rentals, onto the card–SNCF, TER Rhone-Alpes. However, travelers cannot load HSR travel onto these cards. The primary challenges to integrated fares are that SNCF and local transit operators charge users differently.[205]

Figure 22. Part-Dieu Station Map

Source: SNCF (*https://www.gares-sncf.com/sites/default/files/field_plan_files/2015-11/plan-lyd-villette-18-11-15_0.pdf*).

EVALUATION AND LESSONS LEARNED

According to Eidlin, Lyon has been able to "foster development to specifically capitalize on the access benefits of HSR," and the station is now one of the most important business districts in the country.[206] Office space in the district is in huge demand, and companies within Lyon and from other cities in the region have moved to be nearer the HSR station.[207] Some companies from Paris have also moved into the Lyon area to take advantage of the connections HSR provides.[208] Agglomeration economics have led to the increase in other services in the area, such as hotels.[209]

It is important to note that according to Rietveld et al., Part Dieu "was already an attractive location and had market potential before the construction of the TGV."[210] Development has also slowed in the historic city core, in part because of the success of Part-Dieu.

The Part-Dieu station and its redevelopment provide some important lessons:

- Site selection for the HSR is critical and should be implemented as part of a larger master development plan. In Lyon, the station was not in the original masterplan for the district, and for this reason some of the surrounding development did not front the station.

- The coordination of different agencies through the development of SPL was extremely beneficial for such a complex project. SPL's board of directors includes representatives from different entities.

- Strong political leadership is essential and must be combined with consistency of strategy over a sustained period of time.

- Station developers can create a vibrant environment by developing a 24/7 environment in the station district by complementing the commercial/office spaces with housing, mixed-use and entertainment uses.

- It is critical that surrounding areas are tied to the station-area through available transportation options. A great number of different modal choices exist within only a five-minute walk from the Part-Dieu station.

- Providing good pedestrian connections within the station and from the station to its surroundings is important. This was not achieved in the initial project, but the new station redevelopment aims to strengthen the pedestrian connections and minimize the barrier effect in the station.

- The current new phase and redevelopment of Part-Dieu indicates that station mega-projects may need to be considered as phased activities, and provisions should be made for potential future expansions.

Part-Dieu as a master-planned employment district was helped by HSR, as it met and exceeded the City's expectations for not only ridership, but also economic development. The initial project was extremely successful in establishing Lyon as a major transportation hub, and in attracting significant development in the station district. However, its urban design and aesthetics were weak, a shortcoming that is now being addressed in the current redevelopment.

IV-3. UTRECHT CENTRAAL

INTRODUCTION

Utrecht is a city of 311,000 people in the mid-western part of the Netherlands (Table 17). While a train station has existed to the west of the historic city center for almost a century, in 2006, the City of Utrecht produced a masterplan to extensively renovate the train station and the area surrounding it. Considered "one of the major transportation projects in the Netherlands," the station has now become the main train hub regionally, nationally, and internationally.[211] The German InterCity Express (ICE) high-speed trains pass through the station from the Schipol airport to Rotterdam.[212]

Table 17. Utrecht Centraal Station and Station Area Facts

Region	
Location	City Center
Population	311,000 (city)
Population Density	3,500 mi^2 / 9,000 mi^2
Station	
Location	Adjacent to historic city center
Type of Project	Redevelopment
Station Size	90 hectares of development area
Number of Transit Riders	Up to 285,000 (daily)
Types of District Land Uses	Retail, exhibition hall, theatre, institutional, office
Parking	1,500 (car) 16,700 (bicycle)
Elevation	Elevated
Transportation Modes	HSR and non-HSR rail, bus, tramline, bicycle, car, car share

Source: Gemeente Utrecht et al., Conceição 2015.

STATION AND STATION-AREA

Neighborhood Context

The station is located adjacent to the city center and is a little more than a half mile away from the heart of Utrecht. The station demarcates the expanded 20th century boundary of the city. To the northwest, the Lombok neighborhood is a multi-cultural neighborhood with many Turkish and Moroccan immigrants.[213]

Figure 23. Entrance to Utrecht Centraal

Source: Peters 2016.

Station Development

A train station in a succession of different iterations, has existed in the area where Utrecht Centraal is located since the mid-1800s. In the 1970s, the city redeveloped the station area, building an elevated station and a shopping center, office, and housing project called 'Hoog Catharijne,' converting the Catharijnesingel waterway into a motorway. According to the City's website, "ever since the Hoog Catharijne shopping mall was built in the 1970s there has been a maintenance backlog, neglect, a growing number of passengers, a growing city and the desire to get water back into the old canal." In addition, the historic city center and station area were poorly connected and considered as "two separated parts of Utrecht."[214] In 2006, the City issued the Stationsgebied Utrecht Masterplan, which laid-out an updated redevelopment proposal for the station area intended to be completed in 2030. This project is called 'CU2030.'[215]

Station Basics

The City almost completely rebuilt Utrecht Centraal between 2008 and 2016. While they maintained some of the original station platforms, they rebuilt and substantially expanded the station building (Figure 24). Over 900 trains, thirty-one of which are high-speed trains–ICE International–to and from Germany and Switzerland, pass daily through the station, making it the busiest station in the entire country (Table 18). The station is owned and operated by the National Railway Company.[216]

Figure 24. Benthem Crouwel Architects Rendering of the New Station Building and Tall City Hall Building in the Background

Source: http://benthemcrouwel.com/?post_type=projects&p=1631

Table 18. Utrecht Centraal Station Basic Facts

	When built	Present	2020
Travelers Daily (all modes)	97,000	~244,000	295,000
Tracks	16	16	16
Train Lines	31	31	n/a
HSR Trains Daily	6	6	n/a
Conventional Trains Daily	n/a	900	n/a

Source: Gemeente Utrecht et al., Wikipedia.

Station-Area Basics

The station area, as defined by the City's Stationsgebied Utrecht Masterplan, is 222 acres. It currently contains the City's largest shopping center, Hoog Catharijne, the Jaarsbeurg Convention Center, Beatrix Theatre, and the Rabobank high-rise, and is a major employer in the area.[217] As part of the continuing redevelopment of the area, twenty-seven projects are scheduled to be built with total investments of approximately three billion euros.[218] On the west side of the station, a new city hall building and a variety of mixed use buildings are being added. To the east, a number of commercial and office buildings are being developed, and Hoog Catharijne is being remodeled. To the north, the redevelopment includes a new library, a redesigned garden, and a music venue to add art and culture to the area.[219]

While the station building remodel and city hall relocation are complete (Figure 26), the station plazas and Hoog Catharijne shopping center renovations, as well as, infrastructure improvements, are still ongoing (Figure 25).[220]

Restaurants Entertainment Business Hotel & Parking

Figure 25. CU2030 Station District Vision

Source: Peters 2016 (Public information board, photographed during D. Peters' site visit on 27 July 2016).

Figure 26. New City Hall Building as Seen from the Train Platform

Source: Peters 2016.

THE PLANNING PROCESS

Station and Station District Planning

The City has spent decades bringing the planning for the Utrecht railway station and station-area redevelopment to fruition. Developed in the early 1990s, the Utrecht City Project masterplan proposed a public-private redevelopment plan. This plan was never implemented, and in 2002, the City made a new redevelopment proposal. The new city government held a referendum, letting the residents choose between a plan that would redevelop a small, but dense, mainly private area around the station, or a plan that would cover a larger area and include more public space renovation.[221] The citizens chose the second plan, which became the Stationsgebied Utrecht Masterplan. As part of the Masterplan, the city laid-out the following key goals for the station:

- Expand and modernize the station building;
- Comprehensively restructure and update the district;
- Improve the connection between the station area and historic city center; and,
- Develop a new, vibrant, mixed-use area with new high-quality public plazas.[222]

The Masterplan includes three primary elements:

1. Rasterkaart–Grid Map: a development framework. It provides the basis for zoning by laying out the scale of development and design conditions in each area without dictating the exact use mix or ownership. According to Henk Bouwman and Henco Bekkering of HKB Urbanists, the goal was to "avoid dependence on too large a complexity in shared land ownership and shared use by completely different users."[223]

2. Programmakaart–Program Map: the type of development allocation. This map "defines and locates the different types of development," but avoids becoming a development program, since the realization of these developments is highly dependent on the economic situation at the time.[224] Figure 27 shows the different development scales of this plan.

3. Openbare Ruimtekaart–Public Space Map: the public space and traffic proposal.

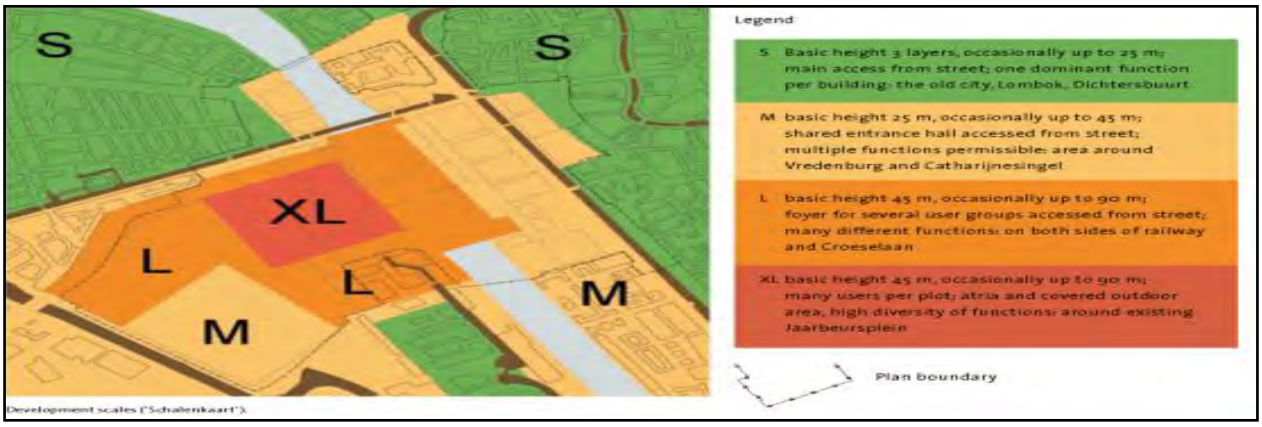

Figure 27. Development Scales for the Utrecht Centraal Station

Source: Bouwman 2007.

Primary Actors

The station-area plan is a joint planning effort between the City; Klepierre, which now owns the Hoog Catharijne Shopping Center, having bought it off the previous owner, Corio, in July 2014; NS, the primary railway operator in the Netherlands; ProRail, part of NS which maintains and extends the rail network; and Jaarbeurs.[225] While the City ultimately still makes all major planning decisions, private actors are critical for the redevelopment, working in close cooperation with the municipality to develop the plans for their own properties.[226] These entities and the City sign a set of agreements– intention, development, and project agreements–for each building.[227] All of the key decisions, including the crucial relocation of one tram/light-rail line, have now been made. After many years of construction, people in Utrecht are eager to see the finished product, and opposition to the project has quieted.

Planning Challenges

The landslide municipal elections of 2001 brought the Leefbaar ("Livable Netherlands") movement into local political power in Utrecht, forcing a re-thinking of previous plans. But as Bowman and Bekkering note, other challenges abounded even before these new political hurdles appeared, as the initial plan had burdened private investors with too much of the investment risk, making a universally agreed-upon joint-development project impossible:

> *In fact, the UCP (United Civil Party) was hamstrung before the election by the fundamental problem of creating a fully shared land development bank, based on the false (or far too optimistic) assumption that the public and private parties could have equal interests and complete the various parts of the plan over the same time period. The private partners found themselves bearing risks in the realisation of a new public transport node over a period of ten or twenty years.*[228]

This also explains why subsequent plans shied away from following a scheme that would have put development over the tracks, thus complicating land titles and building rights. Another major challenge to the entire project was the fact that the entire area is heavily polluted and the construction process increased the risk of spreading the contamination via volatile compounds. At some point, the entire project was questionable, due to environmental concerns.

STATION LAYOUT, ARCHITECTURE, AND USES

Station façade

The station prior to its redevelopment was considered to be overwhelmingly large and complex, and was difficult to navigate, "a result of its extension, successive adaptations and additions." The station was made up of "…different architectural styles and many uninviting spaces, such as the tunnel like bus and tram station on the east side…."[229] The new elevated station building, which sits above the tracks, was designed by Benthem Crouwell Architects.[230] The station, which is light and airy, resembles an airport terminal in its design. On the ground floor, passengers access all transportation modes on parallel platforms and retail shops. Two elevated passageways, one covered outdoor and one indoor, function as dedicated pedestrian connections between the squares on either side of the building and are lined with retail and a view of the trains below (see Figure 28).

Figure 28. View from Elevated Retail Area of Utrecht Centraal

Source: Peters 2016.

Station Uses

The original station contained a variety of retail. In spite of this, the station functioned primarily as a transportation node, instead of drawing people to spend time there outside of traveling.[231]

The new station's design includes separate areas for travelers and non-travelers, and the station contains a vast array of retail, which primarily provides food service. There are no designated waiting areas for long distance passengers because the different modes are close to each other. The station also provides typical travel services, including luggage handling and storage.[232]

Station-District Integration

The station pre-redevelopment was both undifferentiated from the surrounding buildings and poorly integrated with the rest of the city. For example, Conceição considered the Hoog Catherijne shopping center, "more of a labyrinth hindering travelers than a pleasurable place," and noted that the shopping center prevented easy access from the station to the

historic city center. Traveling in the other direction, passengers used a, “long elevated corridor with low ceiling” to access the Jaarbeurg convention center.[233]

The recently renovated station is detached from the surrounding buildings and has two clear end points. An elevated square at each end of the station “creates the transition to the ground level.”[234] Jaarbeurg square faces the Jaarsbeurg convention center, Beatrix Theater, and the new City Hall building. On the western side of the station, the Station Plaza–Stationsplein–faces the Hoog Catherijne shopping center.

Overall, the pedestrian connection over the train tracks is much more direct and clear. Elevated passages allow passersby to travel across the tracks without conflicting with travelers.[235] The remodeling of the Hoog Catharijne shopping center will make the pedestrian access from the station to the historic city center easier. The station-area plan also involves reconstructing the Catharijnesingel waterway and deconstructing the motorway, improving pedestrian spaces in the surrounding area, and those between the historic city center and the station area.[236]

The fact that there are now turnstiles at both ends of the station–erected to combat fare evasion–does not seem to keep large numbers of people from accessing the retailers in the station (Figure 29). Barend Kuenen, director of retail and services at NS stations of Dutch Railways, observed that retailers experienced about a twenty to twenty-five percent drop in sales, for which the private companies are being reimbursed by the rail company. But since most Dutch rail users now have a fully linked transit pass, used daily for their commuting trips around the Netherlands, the turnstiles will indeed mainly deter those not intending to pay any fares.[237]

Figure 29. Turnstiles that Control Passenger Flow in Utrecht Centraal

Source: Peters 2016.

Wayfinding

Station designers considered improved wayfinding an important part of the station remodel (Figure 30). Signs within the station guide travelers from end-to-end. Wayfinding also needed to be updated in light of the installation of the fare turnstiles.[238] Given its airport terminal feel, orientation within the station is easy, but the responsible wayfinding company–Mijksenaar–reports that they were asked to develop "extra large signs… designed specifically for Utrecht Central station due to the vast scale of the station."[239] A conscious effort was made to clearly guide passengers to bus connections, especially as there are two separate locations for bus departures.[240]

Figure 30. Wayfinding to Different Transportation Modes in Utrecht Centraal

Source: Peters 2016.

Parking

Overall, accessing the station by car is discouraged. However, there are park-and-ride spaces outside the station, and there is ample underground parking–approximately 1,500 spaces–provided.[241] Table 19 shows the parking costs at a station garage.

Table 19. Parking Costs at Parkeergarage Stationsstraat Utrecht

1 hour	€3.33 per hour
24 hours	€30

Source: http://www.parkeren-utrecht.nl/parkeergarages/parkeergarage-stationsstraat

The station redesign includes two large main bicycle parking structures. The first is hidden beneath the access stairs leading to Jaarbeursplein, and the second is located underneath Stationsplein Oost, an elevated square to the east.[242]

STATION MODAL INTEGRATION

Prior to the area redevelopment, traveling between the different modes was not easy because of the distance between them, and the difficulty of navigating the station. Train platforms, regional and local bus stops, and bicycle paths were located at the ground floor, and kiss-and-ride parking lots and taxis were at an elevated platform.[243]

According to Bouwman and Bekkering, "The concept of the planned station is simple and very strong: the new terminal will integrate all modes of public transport and treat them all in the same way."[244] The new station has improved physical integration of the different transportation modes, making the transition between modes faster and smoother. The distance between the transportation modes is smaller, and taxis and cars are no longer accessed from an elevated level. The station serves as a stop for thrity-one train lines and thrity-five buses. The tram line station is located in Jaarbeursplein.[245]

The redeveloped station serves pedestrians and bicyclists much better than the old building. In Utrecht, a large number of travelers access the station primarily by bicycle. The station is surrounded by redesigned bicycle paths, and the elevated pedestrian passages over the tracks also serve bicyclists.[246] Bicycle parking was always an integral part of the station redesign, with the first section of a large facility for 4,200 bicycles already completed, cleverly tucked away underneath the steep access stairs at Jaarbeursplein (Figure 31). The station-adjacent facilities are ultimately supposed to offer parking for up to 12,500 bikes.

Figure 31. Underground Bicycle Parking in Utrecht Centraal, Inside View

Source: Peters 2016.

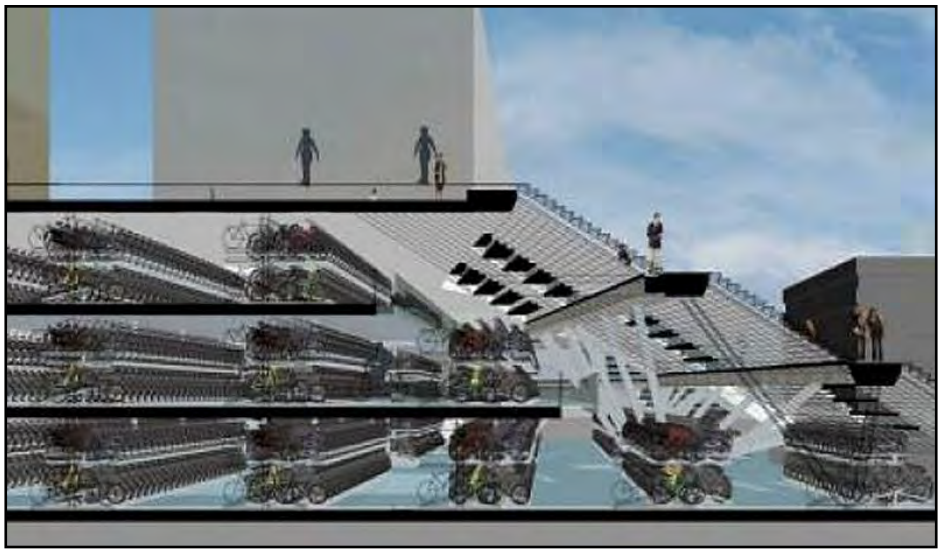

Figure 32. Underground Bicycle Parking in Utrecht Centraal, Sectional View

Source: https://bicycledutch.files.wordpress.com/2014/07/profile.jpg?w=547&h=319

There are a variety of car rental companies and car share options within walking distance of the station. Car share is actually promoted by the City as part of a "Utrecht deelt"– Utrecht shares–campaign.[247]

The Schipol Airport is a fifty-minute intercity train ride away, through an indirect train– which requires a transfer in Amsterdam Centraal, departing every fifteen minutes from Utrecht Centraal. A direct train to the airport leaves the station every hour. This train is considered high-speed, but the rail infrastructure to Amsterdam is only upgraded conventional, not a new dedicated HSR track.[248]

The primary challenge of better integrating the different modes together in Utrecht Central involved the incorporation of a tram stop into the development. Due to infrastructure issues with this solution, the engineers located the tram stop at the Jaarbeursplein convention center, ensuring better connectivity.[249]

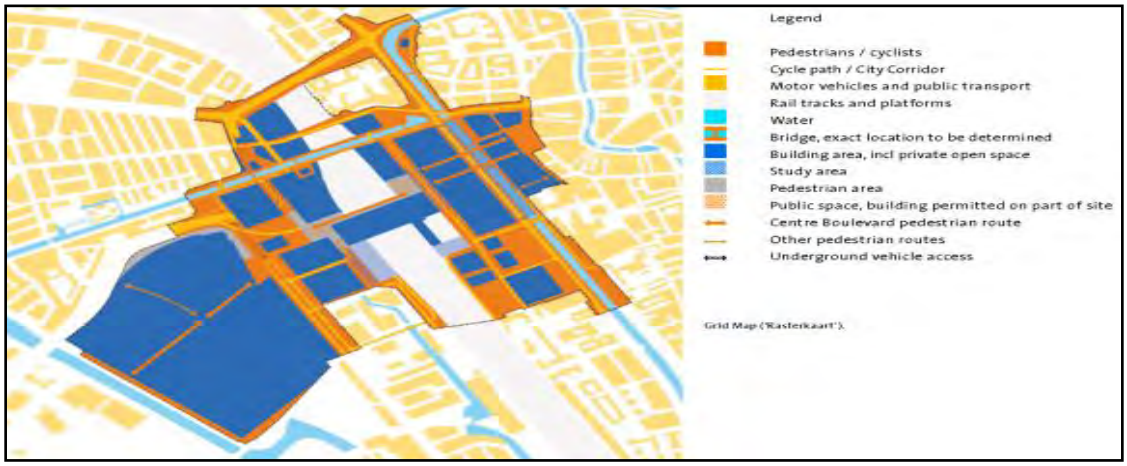

Figure 33. Utrecht Centraal Station Area Development Framework (CU2030)

Source: Bouwman 2007.

Ticket Integration

Since most trips taken at Utrecht Centraal are general commuter trips, not HSR trips, the vast majority of travelers now use a national rail travel card for these trips. Passengers must purchase a supplemental ticket to travel on the German ICE trains within the Netherlands, and need to buy international tickets if they travel abroad. All transactions can be executed at the automated ticket machines around the station.[250]

EVALUATION AND LESSONS LEARNED

As the redevelopment of both the station and station-district occurred fairly recently, it remains to be seen what impact the redevelopment, and especially the finalized renovation of the giant shopping center, will have on the area. The station itself has been so successful in terms of passenger volumes, that planners are already questioning why they did not construct platforms in an even more generous manner.[251]

Some of the key lessons learned in Utrecht are the following:

- It is not uncommon for a master planning process to have multiple false starts, and for redevelopment plans to go through many iterations before a final scheme comes to fruition. Utrecht proves the need for "flexibility in the process,"[252] and for public-private partnerships possibly playing a key role in it. As is the case with all megaprojects of this scale, the project at times encountered fierce opposition. But once the dust had settled from the surprising 2002 local elections, and people came together in the next electoral cycle, the process seems to have been remarkably efficient at bringing all public and private stakeholders back to the table, developing a feasible and flexible enough master plan that everyone could agree to.

- An initial scheme proposing an oversized project eventually failed to get built. After fits and restarts, the project was finally resized to a redevelopment scheme that was more in keeping with the area and Utrecht's urban economy. And for the station itself, a simple, relatively unspectacular design solution was found.

- Unlike in Rotterdam, the rebuilding and rebranding of Utrecht Centraal was not tied to a complete re-invention of Utrecht's national and international image or its post-industrial economy. Such possibilities were more limited in Utrecht mainly because the station rebuilding did in fact not go hand-in-hand with a significant change of Utrecht's position in the national or international rail system, or a change in its accessibility to other European metropolises.

- Utrecht's lessons for San Jose are more valuable in the arena of governance, showing how political change can be highly disruptive to a complex planning process, yet how it is ultimately not likely to derail the process altogether.

- Utrecht also illustrates the key importance of competent legislation in megaprojects. For the entire project, which ultimately comprised of twenty-seven sub-projects, as many as 4,200 different licenses or permits had to be issued by the respective municipal agencies, of which as many as half could have been the subject of appeals.[253]

- Utrecht is also relevant to San Jose; as a HSR station redevelopment project that recognized the spatial disconnect between the old station and the historic city center, as a primary challenge the redevelopment wanted to address and overcome. It illustrates the difficulty of a large indoor shopping mall, even in a higher-end, redeveloped form, to serve as the appropriate connecting link.

- There is, of course, also the almost inevitable issue of cost overruns. Pieters reports that the station rebuilding is already more than fifty-three million Euro over budget.[254]

IV-4. ROTTERDAM CENTRAAL

INTRODUCTION

Rotterdam was founded in 1270 and has been one of Europe's major commercial cities since the 1300s. Located at the Rhein-Meuse-Scheldt river delta, the city has the busiest port in Europe. The heart of the city was almost completely destroyed by the German Luftwaffe in 1940–(during World War II), and was only gradually rebuilt in the 1950s and 1960s, but planning efforts were often piecemeal, and not necessarily part of a coherent, strategic vision. More strategic architectural and urban planning concepts emerged in the 1980s, with decision-makers now actively trying to turn Rotterdam into one of Europe's most important cities for modern architecture. Along with this transformation, Rotterdam also began to morph itself into a center of the service economy, vying to be a headquarter location, not just for national, but also for international firms.

The introduction of HSR undoubtedly brought greatly improved accessibility and economic development to the city.[255] Rotterdam benefits immensely from its proximity to Amsterdam and Brussels, serving as an intermediary station along a new international high-speed route that also puts Paris, London and Cologne within easy reach. The opening of the Netherlands' new High-Speed Line South put Rotterdam a mere twenty-minute ride from Amsterdam Schipol, the country's main international airport, while Brussels and Paris are now only one hour ten minutes and two hours forty minutes away, respectively. Rotterdam Centraal station is in the heart of the Rotterdam Central District ("RCD"), described in more detail below. The number of passengers at the station is projected to grow from 110,000 in 2000 to ~320,000 in 2030.[256,257]

Table 20. Rotterdam Station at a Glance

Region	
Location	Rotterdam, Netherlands
Population	610,000 (city) ~1,200,000 (metropolitan area)
Population Density	7,690 people per square mile
Station	
Location	Gateway to city center on one side, historic district on the other
Type of Project	New construction Old station closed in 2007, new station opened in 2014
Station Size	Gross floor area: 46,000 square meters
Types of Land Uses	Commercial, residential, hotel, office
Parking	750 new spaces to connect with existing car park
Elevation	Station at grade. Rail tracks above.
Transportation Modes	High-speed rail, regional trains, metro, taxi, bus, trams, car, motorcycle, and bicycle parking

Sources: misc. incl. Wikipedia, Terrin (2009), Griffiths (2014) and personal observation.

STATION AND STATION-AREA[258]

Neighborhood Context

Rotterdam Centraal is a station located at the intersection of two very different neighborhoods, and thus correspondingly features two very different facades.[259] To the north, the station abuts the leafy green canals and quiet streets of the residential Provenierswijk neighborhood. To the south, the station faces the Weena, a large, busy commercial boulevard, lined with many new high-rises, leading the way towards Rotterdams' center. Thus, the station site plan (Figure 34) needed to appropriately address two very different contexts. Accordingly, the northern Provenierswijk entrance of the station was designed to handle a smaller number of passengers. It has a simpler, less-striking glass façade and a much smaller station plaza that immediately dissolves into the surrounding neighborhood (Figure 35). There is also an abundance of bike parking on the western side of this exit, immediately adjacent to the bicycle and pedestrian tunnel linking the two sides (Figure 36 and Figure 37).[260]

Figure 34. Site Plan of Rotterdam Centraal

Source: http://images.adsttc.com/media/images/5282/391a/e8e4/4e22/2500/0008/large_jpg/Site_Plan.jpg?1384266003

Figure 35. The Simple Northern Façade of Rotterdam Centraal

Source: Deike Peters.

Figure 36. Ample Bike Parking Immediately Adjacent to the Tracks

Source: Deike Peters.

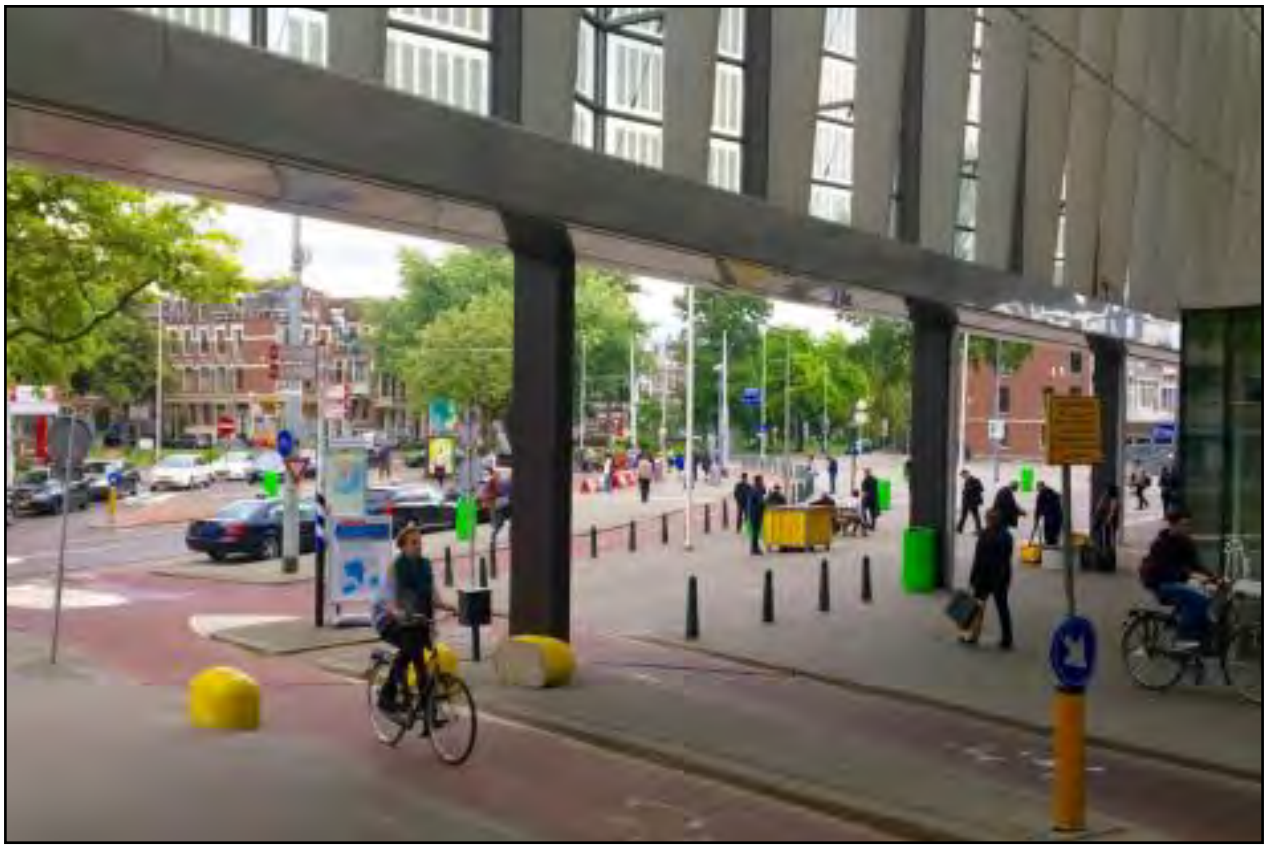

Figure 37. The Bike-Ped Tunnel Connecting the Northern and Southern Ends

Source: Deike Peters.

The south side of the station, by contrast, is designed as the gateway to the urban center, and is intended to be iconic. The City of Rotterdam ("City") made a decision to not just upgrade the rail station, but to redevelop and upgrade the entire area around it, so these developments and corresponding designs are inextricably mixed.

The station's roof projects over the public plaza in a triangular shape, directing people towards the activity and destinations in the urban center (Figure 38). In fact, the entire large station hall at this end can be considered as an extension of the same large plaza. Indeed, from the pedestrian's perspective, the transition from the plaza into the large arrival hall is seamless. The plaza experience is greatly enhanced by the fact that the busy Weena Boulevard was placed underground in a short tunnel, so that pedestrians have to encounter a handful of slow-moving cars, as well as, bicycles and a multitude of tram lines crisscrossing the area and arriving at the station from all four sides.[261]

The old Rotterdam Centraal station was not only architecturally drab, but also quite inaccessible for pedestrians. It was not easy to find the station from the city center, and the area in front of the main entrance was cluttered with trams, buses, taxis and bicycles. In addition to the potential for collisions, the station area did not feel very safe, and its public spaces were not well-used. To address this issue, the design team created a new pedestrian plaza connecting the station to the center of the high-rise district along Weena Boulevard (Figure 39).

Figure 38. The Station Façade to the South, with its IntegratedLarge Plaza, at its Grand Opening in 2014

Source: http://www.west8.nl/press_releases/14_mar_2014

Figure 39. Rotterdam Centraal in 1960 (Decades before Reconstruction)

Source: NIEUWS (http://www.nieuws.top010.nl/centraal-station-sybold-van-ravesteyn)

Station Development

In 2007, the old station, built in 1957 (Figure 39), was demolished to make way for a new and larger station, which officially opened in 2014. In addition to striving to accommodate expanded services and three times the number of passengers, the redevelopment of the station also aimed to create improved pedestrian linkages between the station and the city center, catalyzing the creation of a successful office district.[262]

Station Basics

The tracks run from east to west, and rail passengers access the platforms via a central access tunnel running perpendicular, from north to south (Figure 40). There are seven elevated tracks covered by a large glass roof, which extends far into the southern plaza (Figure 41 and Figure 42). The station is fully clad in stainless steel for the main portion, with some wood finishes, while the portion that projects over the plaza is covered by wood. The solar panels that are partially covering the roof are designed for maximum transparency. Overall, the station has a large, light modern feel (Figure 43, Figure 44, and Figure 45).

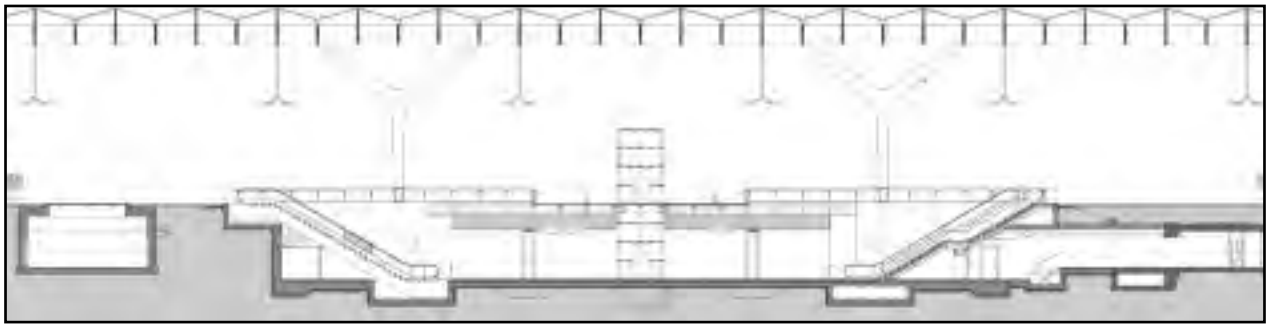

Figure 40. Railway Yard Section

Source: http://www.dezeen.com/2014/03/22/rotterdam-centraal-station-benthem-crouwel-mvsa-architects-west-8/

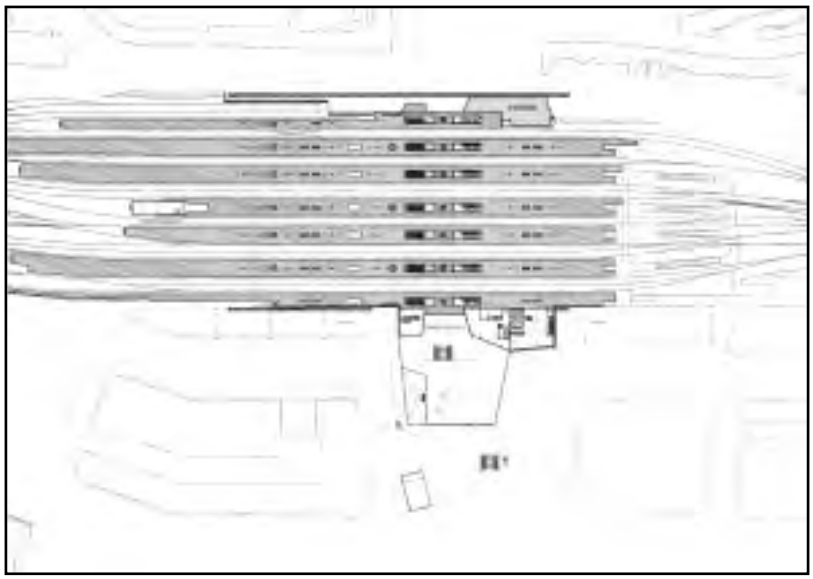

Figure 41. Station Plan

Source: http://www.dezeen.com/2014/03/22/rotterdam-centraal-station-benthem-crouwel-mvsa-architects-west-8/

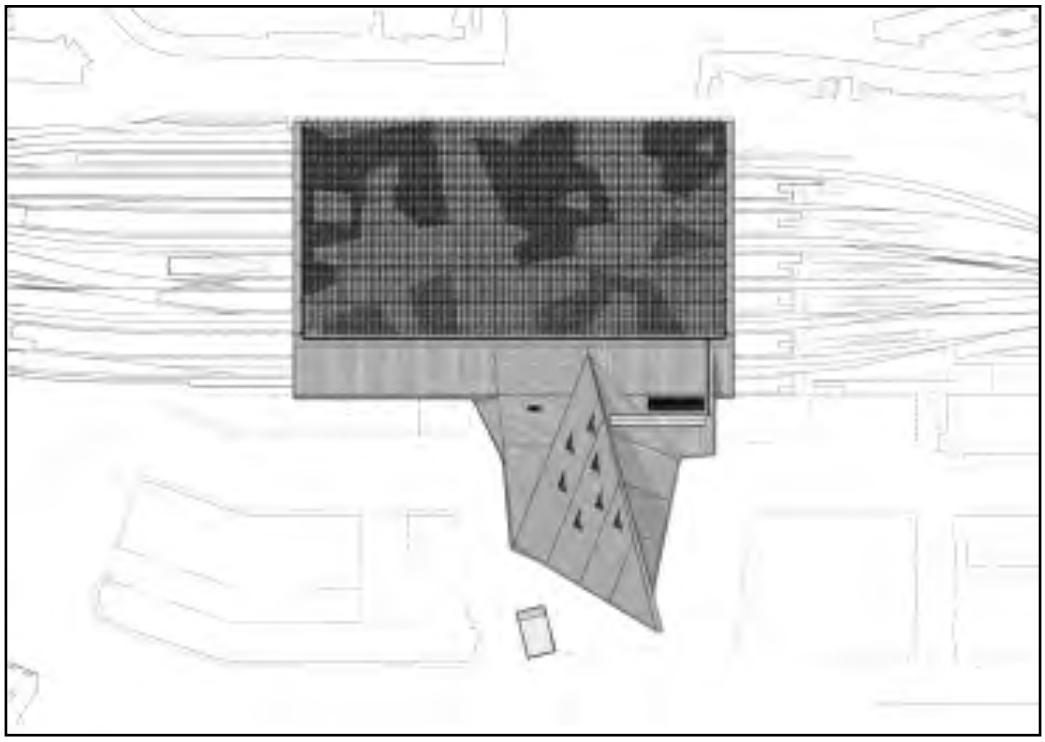

Figure 42. Roof Plan

Source: http://www.dezeen.com/2014/03/22/rotterdam-centraal-station-benthem-crouwel-mvsa-architects-west-8/

Figure 43. Main Station Entrance

Source: http://www.nationalestaalprijs.nl/archief/2014/winnaars/utiliteitsbouw/station-rotterdam-centraal1

Figure 44. Lobby/Atrium

Source: http://www.archdaily.com/447649/rotterdam-centraal-team-cs

Figure 45. The Station Platforms and the Solar-Paneled Roof

Source: http://www.archdaily.com/447649/rotterdam-centraal-team-cs

Station Area Basics

As noted above, the station is strategically positioned between a residential area to the north, and the city center to the south and east, with a large station plaza serving as a gateway to the city's commercial heart.

THE PLANNING PROCESS

Station and Station District Planning

The First Round

The initial ideas for the new station were developed as early as 1995, with Dutch Railways and the local government taking the lead, and the national government not yet involved.[263] But Rotterdam Centraal then became one of the six "New Key Urban Projects" (Nieuwe Sleutelprojecten, NSP) promoted by the Dutch government, as HSR entered the national conversation in the late 1990s.[264,265] The five other urban redevelopment projects centered around the rail stations of Utrecht, Amsterdam South Axis/Zuidas, The Hague, Arnhem and Breda.

By 1999, two private investors had joined, and Alsop Architects in London was commissioned for an ambitious design that turned-out to be overly elaborate, with two giant 'champagne glass' structures marking the entrance to the station. Alsop Architects' 2001 masterplan called for 6,000,000 square feet of real estate development, of which 2,100,000 square feet was to be residential, 3,400,000 square feet of offices and a hotel, and 1,350,000 square feet of "urban entertainment."[266] However, when the two private investors left the project–for reasons not directly related to the project, the $875-million price tag of the plan was too expensive to take on as a mostly public project, and the political tide quickly turned against the project. Many politicians voiced more skeptical opinions about Rotterdam's ability to fulfill its ambitions to become a center of the knowledge economy. Local elections in 2002 brought to power a political party that was adamantly opposed to the initial masterplan, deeming it overly extravagant. A more modest and more affordable version of the plan was now needed, and that is where "Team CS," a consortium between West 8, Benthem Crouwl Architekten and MVSA Meyer en Van Schooten Architecten, came in.

The Second Round

The second version of the station redesign was planned by Team CS. The architects had to negotiate a complex program including the two station halls to the south and north, the platforms and concourse, as well as, the accommodation of office and commercial space along with the design of various public spaces. The clients were the railway companies, Dutch Railways and ProRail, as well as, the City.

The station area, meanwhile, was transformed and densified according to a new master plan developed by the Maxwan architecture firm.[267] Figure 46 shows the boundaries of the master plan, identifying the core "Mixone" new development area, along with all other key

individual real estate projects in the area. The master plan area included twenty hectares of land along the southern exit of the station and also included the design of a new bus terminal to the west of the station, several other public spaces and up to 600,000 square meters of mixed uses. The plan purposely included businesses that would otherwise not be able to afford rent in the area, but that could contribute to its economic outlook; for example, art galleries and cultural exhibitions. The overall vision focused on strengthening the economy, investing in residential areas–urban upgrading, and attracting high-income earners.[268,269]

The station-adjacent area that was to form the crucial hub of uses in the core of the RCD is called the "Mixone." Somewhat confusingly, the respective 'area management organization' ("AMO") managing the area is simply called, "Rotterdam Central District." According to its website, the objectives of the association are, "marketing and promotion in order to recruit new users,…placemaking [and]…network meetings (business club)." The association was founded in April 2009, "during a meeting in the middle of Rotterdam Central District, in the Unilever building at the Weena."[270]

Figure 46. Rotterdam Station Area Master Plan Boundaries and Major Projects

Source: Maxwan Website at http://maxwan.nl/selected-projects/rotterdam-cs/#/t_1538/rv/

As can be seen in Figure 46, there are several individual high-profile real estate projects in the immediate station area. One of the most prominent ones, marked as "8-Rotterdam High Rise," is the Delftse Poort building, situated on Weena Boulevard, immediately adjacent to the station. This building was already completed in 1992, and erected as a key architectural icon signaling Rotterdam's ambitions towards a new post-industrial future. The official site of RCD provides its details as follows:

Delftse Poort offers 65,652 m² in floor area and 596 parking places. Delftse Poort soars up to 150 meters in height. The office tower is functional and modern, offering all the aspects of a contemporary facility. The building complex includes high-rise and low-rise elements. The building systems are distributed in such a way that the building can be divided into five separate sections.[271]

Primary Actors

Achieving the goals for Rotterdam Centraal and the station area ultimately required a high-level of cooperation among all relevant stakeholders, including ProRail–which owns, maintains and coordinates the use of heavy rail infrastructure in the Netherlands, the Dutch Railway (NS) and several other transportation operators, the City, the regional government, the federal government, and others.

Early-on in the process of designing the new station, stakeholders developed and signed a memorandum of understanding (MOU) identifying the shared goals for the station and station-area reconstruction. With shared goals, all the parties were now committing to the same vision of success. The MOU also articulated the relationships and interdependencies between each of the projects happening at the station–e.g., relationship of new HSR to the addition of new passenger amenities, relationship of the relocation of the bus terminal to the new pedestrian plaza, etc. This facilitated a mutual understanding of how decisions about one project would influence other projects co-located at the station. The MOU also included a detailed plan for phasing the planning, design and construction of each component of the transportation projects and the station. This was an essential step in being able to keep transit operating, while demolishing the old station and building the new one.[272]

Planning Challenges

In order to take advantage of its improved accessibility to other major European cities, decision-makers realized that it was important to draw people to Rotterdam for many different types of activities. They knew that it was essential to have a mix of uses in the station-area, in order to have round-the-clock activity. However, cultural and educational institutions–e.g., museums and universities–could be easily priced-out of the area, if the team was successful in growing Rotterdam's office district. These institutions, therefore, received some protection and rent subsidies, so they could stay.

Another key challenge of the expansion of Rotterdam Centraal was to maintain transportation operations during construction. This required the team to build a temporary station before completing the new station hall and facilities. The design team recognized that they did not have to wait until the station was finished to make it usable. They added temporary things for travelers and other visitors to do, eat, and see in and around the station, setting up temporary shops, bike storage and bike sharing facilities, and even a pop-up movie theatre called 'Kriterion Rotterdam.' One of the most remarkable, and beloved, temporary installations was a seventy-five-story staircase to the top of the adjacent historic Groot Handelsgebouw building, allowing people to look-out over the city and celebrate the reconstruction of the station.[273,274]

STATION LAYOUT, ARCHITECTURE, AND USES

Station Façade

As noted above, the station has two very different façades. While the south façade is explicitly iconic, the north façade presents a clever, straightforward design-solution, but is not nearly as eye-catching as the south side. The south façade is the most important design feature of the entire structure, announcing the station to the surrounding district, and tying together and unifying the station building and the station plaza (Figure 43, Figure 35). Figure 47 shows how the scale of the north façade necessarily needs to be more modest, because on this side, the station is surrounded by two-to-three story residential buildings, instead of the high-rises found on its southern and eastern sides.

Figure 47. Residential Buildings Facing the Station's Northern Façade

Source: Deike Peters.

Station Uses

As noted above, the station accommodates not just the various transportation functions, but also provides commercial space and some office space. Thus, the station has to integrate a variety of complex transportation and other uses. The integration of the transport functions has been achieved very well and will be described in more detail below. As far as the commercial spaces are concerned, there is a modest number of retail, souvenir and tourist information shops present in the main station hall, including a higher-end souvenir shop with lots of merchandise for the local soccer team.

Station-District Integration

The station is well-integrated into the surrounding districts. The bicycle and pedestrian tunnel on its western size minimizes the barrier effect of the station, even as crossing through the actual station is now technically only allowed for ticket holders. Most European

train stations operate as open-gate systems, where passengers board freely and tickets are still checked by conductors on the trains. However, the Dutch National Railway operator, NS Rail, recently decided that fare evasion had become a major problem, and has installed ticket control stations at all major train stations. All recently completed major Dutch stations in Amsterdam, Utrecht and Rotterdam were retrofitted with fare gates at the transition areas, from the station to the access corridors leading to the trains. These corridors, however, are where almost all station convenience shops are located. So now only ticketed passengers have access to these commercial areas. As a result, retail sales have dropped, but the railway company is compensating retailers for their losses.

As noted previously, the new station and the southern station district were explicitly planned together, and the new high-rises in the district reflect the elevated status and higher-use value of the entire area.

Wayfinding

Orientation within the station is easy, because the glass-walled station halls at both ends allows station users to freely see all elements inside the halls, from the information booths to stores and ticket machines, as well as, view out towards the city. Good signage is present at both ends. As part of the entire project, the company Armada Mobility was contracted to install more than 500 wayfinding elements throughout the station area according to ProRail and NS rail specifications.[275]

Parking

Station planners provided parking for 750 cars and 5,200 bicycles in structures hidden underneath the esplanade, and additional bicycle parking on the north side. There is very minimal drop off–short-term–parking on the east side of the station, some limited street parking on the north side of the station, but access to the western side is via bus and taxi only. As a result, the station can be experienced as a remarkably car-free environment.

Many people access the station by bicycle, especially on the northern side, so that bicycle parking becomes an important issue and problem. Figure 36 shows that station-adjacent parking can become very crowded, even on a regular rainy weekday. Figure 48 shows how bicycle parking is tightly regulated around the station, as rogue bike parking has been a problem in the past. Car parking is equally restricted around the station, as Figure 48 displays.

Figure 48. Regulated Bike Parking (left); Regulated Car Parking (right)

Source: Deike Peters.

STATION MODAL INTEGRATION

An explicit decision was made to relocate buses, taxis and trams from the station front to free-up space for pedestrians around the station's southern exit. The large southern plaza leads into a pleasant, tree-lined esplanade, and several of the tram lines have been rerouted to the east and west sides of the station, in order to minimize interference between trams and pedestrians. Also, car traffic on Weena Boulevard was relocated into a tunnel in front of the station. Figure 49 shows how just having two, instead of the previous five, tram lines crossing the plaza improves interaction between modes, making for a safe environment for bicycles and pedestrians far beyond the immediate station area. Figure 50 shows the east side entrance to the station with its many tram connections, and there is also car/taxi access in the back portion, while Figure 51 shows the convenient bus connections positioned right next to one of the entrances to the metro.

The metro station is located underneath the new station, and in fact, constituted an entirely separate infrastructure megaproject of its own,[276] as the metro lines were enhanced by an additional, newly upgraded light rail line running for sixty kilometers all the way to The Hague, as part of a so-called 'RandstadtRail' extension. For this new extension, which was built at a total cost of 760 million euros, an entirely new tunnel was constructed in Rotterdam to connect to the existing metro lines underneath the Central Station.

Ticket Integration

As is the case in Utrecht, a majority of travelers now used the countrywide chip cards to load season passes or group and individual fares, and thus, quickly and conveniently pass through the new turnstiles and connect to trams, buses or the metro–all of which accept the same cards. For this reason, turnstiles do not necessarily present any hurdles in terms of ticket transfers, and they may prove additionally beneficial, not just in terms of curbing fare evasion, but also providing added security and options for security staff to monitor people coming in and out of the station.

Figure 49. View from the Esplanade Back Towards the Station

Source: Deike Peters.

Figure 50. Multiple Tram Lines Now Converge on the East Side of the Station

Source: Deike Peters.

Figure 51. Bus Bay Shelter with Arrival Times on the West Side of the Station

Source: Deike Peters.

Figure 52. Google Maps Showing Rotterdam Centraal in its Urban Environment

Source: Google Maps.

EVALUATION AND LESSONS LEARNED

Upon its re-opening, the station received immediate praise from a variety of outlets regarding its overall design solution. Alyn Griffiths, the author of an article in the architectural magazine *Dezeen*, for example, could barely contain his excitement, concluding that:

> *[N]ow Rotterdam Centraal has the appropriate structure and dimensions for the urban landscape; it is in balance with the heights that characterize the metropolis and simultaneously reflects the human scale. The city of Rotterdam is drawn to the new station via the compaction of the small-scale urban texture surrounding the public transport terminal. The entire railway zone becomes one with the city. This finer urban texture with new sight lines and a mixture of living and working will dramatically improve the quality of life and the environment of the station area.*[277]

Other assessments were similarly positive. Some of the key lessons learned and observed include the following:

- Rotterdam Centraal presents a good design solution to a situation where a station straddles two distinctly different neighborhoods.

- To develop a successful station, one needs both high-quality station design and a coordinated, well-planned, multi-stakeholder effort aimed at rethinking and transforming the entire station district.

- Seamless multi-modality that successfully integrates multiple public transit modes and lively, non-motorized activity requires an active commitment to scaling back the dominance of automobiles in the public realm. If cars were not diverted to a short tunnel underneath the station plaza, the entire mobility experience across the southern plaza would have been different–and noticeably worse–for all non-car users.

- As a corollary to this insight, tramlines and their station end-points should not necessarily be thought of as a given. In Rotterdam, several lines were rerouted to optimize the overall flow for all users.

- If planned at the right scale, even a very-high volume HSR station does not necessarily need to overwhelm or destroy the quaint character of a residential neighborhood, located immediately adjacent to it. Barrier effects can be diminished by key physical design features, such as a façade designed to blend into the area, and a bicycle and pedestrian tunnel that gets residents to the other side of the tation in minutes, without even having to enter the station itself.

- A phased planning and design process allows more flexibility. Plans for the station and station district were adjusted several times over the decades, also adjusting for the changing real estate market in the area. The final result only appears more fine-tuned to the actual needs of the city, as a result.

- Businesses do not necessarily need to suffer during the construction process, as long as care is taken to diminish disruption, and temporary uses are offered that may attract customers.

- The station's iconic architecture, and in particular its striking southern façade, not only landed the station on a long list of prestigious architectural magazines, but also presented a real opportunity for image- and identity-building in the city, creating a new reason for civic pride in a city that was already known for its knack for modern architecture.

- However, what is also clear is that the success of this redevelopment project was not always guaranteed, and that previous attempts at redesigning the site were unsuccessful, as they were too expensive and lacked full support among the relevant stakeholders.

IV-5. TORINO PORTA SUSA

INTRODUCTION

Turin is a city in northern Italy with a population of approximately 875,000. Turin's metropolitan area, with 1.8 million people, is the fourth largest in the country, and the city has a density of 2,580 per square-mile (OECD 2014). Turin itself is much denser, with 17,330 people per square-mile (Table 21). Located in central Turin, the new Torino Porta Susa station is one of four stations constructed as part of the City's effort to redefine Turin's image, known for its car industry. The City, in partnership with the national railway company, Rete Ferroviaria Italiana ("RFI"),[278] restructured the City's railway and public transportation network by burying the main north-south rail tracks, replacing the tracks with a boulevard, called 'Spina Centrale,' and constructing four new multi-modal hubs. This modernization project, according to Terrin, "takes a structural axis with a strong identity and recreate[s] it with a new identity and metropolitan area dynamic."[279] Both the Porta Susa and Porta Nuova stations serve HSR.

Table 21. Torino Porta Susa Station at a Glance

Region	
Location	Turin, Italy
Population	875,000 (Turin) 1.8 million (metropolitan area)
Population Density	17,330 per mi^2 (Turin) 2,580 per mi^2 (metropolitan area)
Station	
Location	Historic city center
Type of Project	Expansion
Station Size	323,000 ft^2 (total floor area)
Expected Daily Transit Riders	Projected 23,600 per day (2005)
Types of Land Uses	Commercial, residential, hotel, office
Parking	189 spaces
Elevation	Station at grade. Rail tracks underground.
Transportation Modes	High-speed rail, regional trains, metro, taxi, bus, trams, car, motorcycle, and bicycle parking

Sources: OECD (2014), RFI (2015), arch daily (2014).

STATION AND STATION-AREA

Neighborhood Context

The Torino Porta Susa station is located on the edge of Turin's historic city center, less than a mile away from city hall, 'Palazzo Civico.' The station runs parallel to the new Spina Centrale Boulevard for 1,266 feet, and is built on top of the railway tracks the boulevard replaced. According to Terrin, these railway tracks ran down the center of a "former industrial artery edged by wasteland."[280]

Station Redevelopment

Torino Porta Susa is considered the flagship project of the City and RFI's modernization plan. According to Terrin, the station was developed to serve as both the "central point in a high density regional network and totally redesigned urban network," and as a "gateway to Southern Europe."[281] The original Porta Susa station was built in the mid-1800s (Figure 53). RFI started work to build the new station (Figure 54) adjacent to the original in 2006, and completed the project in 2012.[282]

Figure 53. Original Torino Porta Susa Station (1800s)

Source: FS Italiane Group (2012).

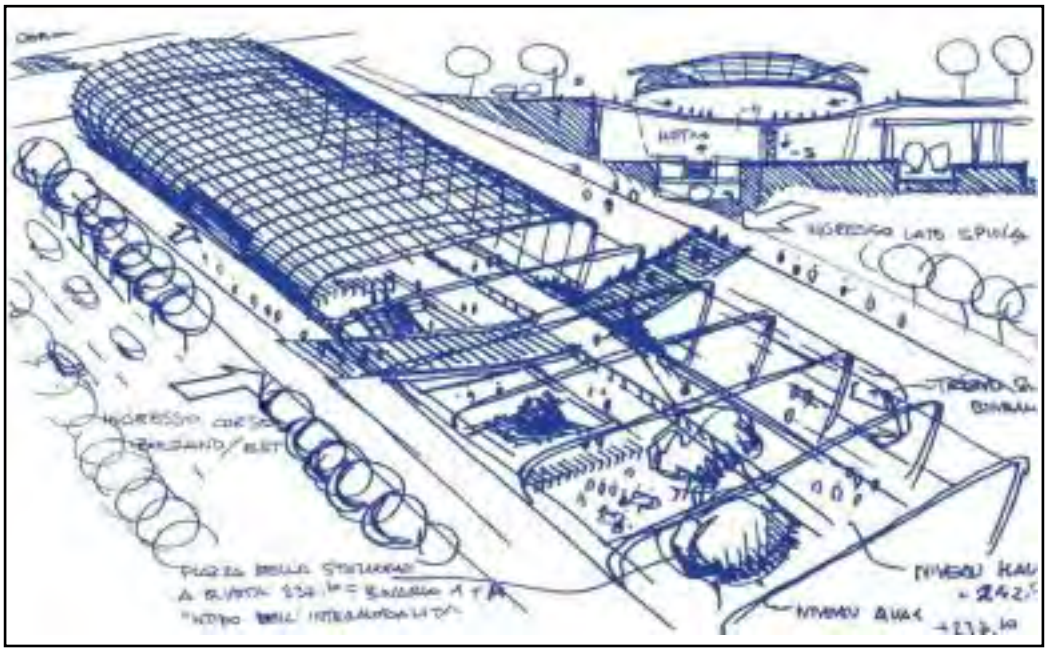

Figure 54. Sketch of Torino Porta Susa

Source: POPSU (*http://www.popsu.archi.fr/popsu-europe/turin/gares-tgv-et-dynamiques-de-renouvellement-urbain).*

Station Basics

Although Torino Porta Susa is one of four train stations in Turin, it is only one of two that connects Turin internationally, and is the main station in the city for trains to Milan. The station is designed as a multi-modal hub serving the metropolitan area, region, and country,[283] and connects HSR, regional rail, metro, buses, tramways, and the Spina Centrale.[284] RFI both financed the station redevelopment and owns the building.

RFI planned the station to accommodate 550 trains daily, with eighty of these traveling long-distance. The company also planned for the station to serve 23,600 passengers daily, peaking at 7,000 during rush hour.[285] Table 22 shows the breakdown of space for different station uses.

Table 22. Basic Station Facts

Total Area	400,000 ft²
Breakdown of Uses:	
Technical	86,000 ft²
Commercial	83,000 ft²
Indoor Pedestrian	14,000 ft²

Source: FS Italiane Group (2012).

Station-Area Basics

In addition to parking garages, green space, and pedestrian areas/outdoor plazas, the area directly surrounding the station includes a residential and commercial tower designed as part of the station design competition (Table 23). The tower serves as a, "vertical street open to the public and housing a variety of amenities at different levels."[286] The tower, built by RFI, is thirty-eight stories, occupies 506,000 square-feet, and will house a hotel, offices, and cultural and leisure amenities (Table 24).

Table 23. Area Use Breakdown Directly Surrounding Station

Total Area	1,940,000 ft² (65% owned by RFI, 35% by City)
Breakdown of Uses:	
Public Car Parks	377,000 ft²
Green Areas	243,000 ft²
Pedestrian Areas/Outdoor Plazas	215,000 ft²
RFI Tower	506,000 ft²
Historic Station	54,000 ft²

Source: FS Italiane Group (2012).

Table 24. RFI Service Tower Uses

Total Area	506,000 (28 stories)
Breakdown of Uses:	
Hotel / Shared Services	226,000 ft²
Offices / Shared Services	226,000 ft²
Cultural / Leisure Amenities	54,000 ft²

Source: Lomholt (2012).

The City is also working to encourage commercial and residential development in the district around the new station, as part of one of three "urban spines" of the city.[287] This one-hundred-acre area will include a variety of public and regional services–including university, judicial, and cultural facilities.[288] Multiple municipal buildings are being refurbished as offices, private services, and a courthouse. Turin Polytechnic is building an extension and university residences, and the City is constructing a new central library.[289]

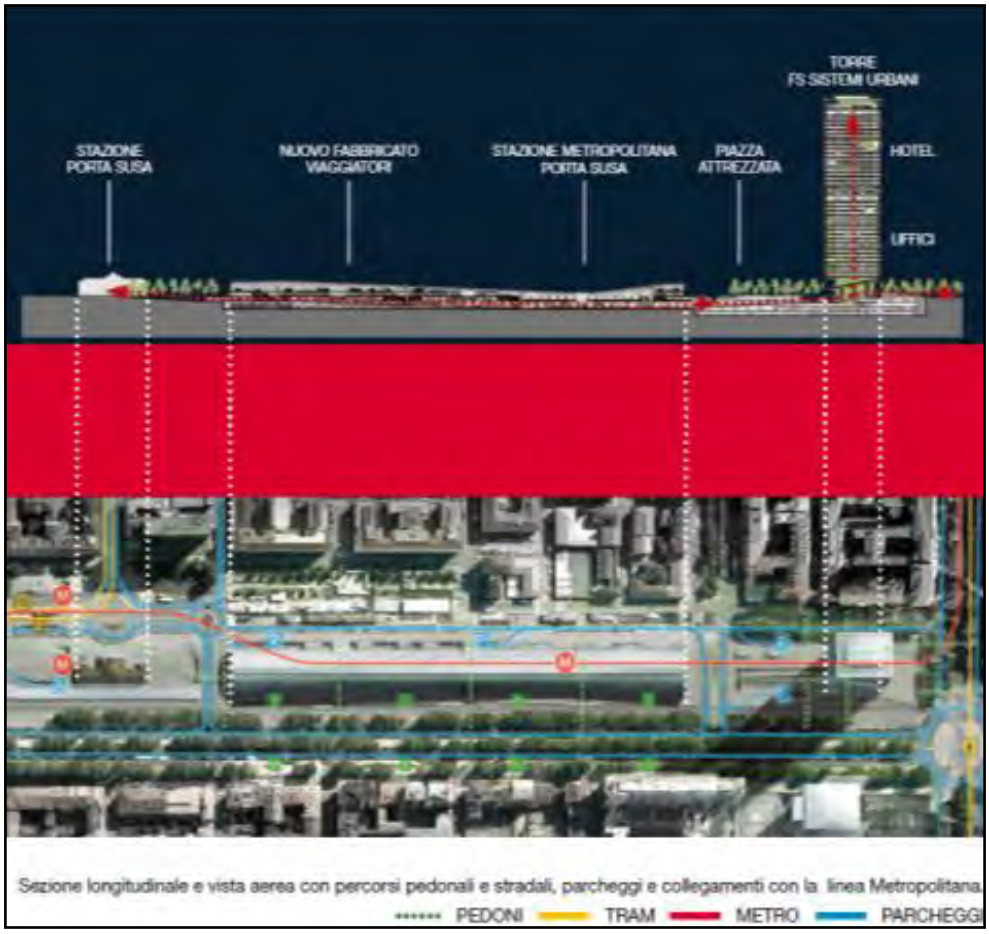

Figure 55. Area Directly Surrounding the Station

Source: FS Italiane Group (2012).

THE PLANNING PROCESS

Station and Station District Planning

In the early 1990s, the City and RFI combined independent efforts to restructure the City's transportation network and spur urban revitalization. During this time, the City was developing a city-wide redevelopment scheme with the goal of redefining the city's image. This effort included a goal to improve public transportation. At the same time, RFI was making plans to increase the number of train tracks on the north-south rail axis, running through the city to accommodate HSR and other public transportation upgrades.

The City and RFI worked together to create a plan to both increase the number of rail tracks and change the city's image (Figure 56).[290] The City's general development plan–Piano Regolatore Generale Comunale, approved in 1995, included a plan to bury the north-south axis rail tracks for almost eight miles through the city and construct an arterial road, Spina Centrale, in its place (Figure 57).

The development plan was considered a, "unique opportunity to rehabilitate the urban environment and make a critical contribution to forging the city's new image," and had four objectives:[291]

1. Integrate Turin into the new European and Italian high-speed railway network–the Turin-Milan line;

2. Increase the quality and frequency of rail service;

3. Create a functionally separate regional transport network, which is physically connected to the rest of the national network and centered on the city; and,

4. Start work to reunite areas divided by the tracks.

Once RFI and the City agreed on the general redevelopment plan, RFI held an international design competition in 2001. The competition jury selected the proposal developed by AREP Group, headed by Jean-Marie Duthilleul and Etienne Tricaud, and architects Silvio d'Ascia and Augustine Magnaghi.[292]

Primary Actors

The City Council and RFI were the key players in restructuring the railway network and spurring urban development. By working together, the City Council and RFI were able to find space for redevelopment in a dense city environment, reusing existing railway infrastructure and industrial wasteland. These actors were also responsible for deciding that the new Torino Porta Susa would be more than just a train station, but also, "a site of concentrated urban functions and the subject of high-quality architectural projects."[293] The Piedmont regional development agency–Finpiemonte–and the Chamber of Commerce were also important actors responsible for developing planning strategies and encouraging private investment.[294]

RFI, the Italian government, the City, and private investors financed the project. RFI financed the station, the Italian government funded the rail network restructuring and metro development, while the City funded some of the redevelopment, including the Turin Polytechnic expansion. Private companies financed most of the development in the industrial wasteland.[295]

Planning Challenges

One of the major challenges the rail network redevelopment project faced was how to encourage local private investors to put money into the project. In order to overcome this challenge, Finpiemonte and the Chamber of Commerce conducted a study that used economic modeling to determine the impact HSR could have on the surrounding area. By investing so heavily on the network, the Italian government also reduced the risk for private investment.

The other primary challenge, typical to inner city development, was reducing the impact of a ten-to-fifteen year project on the surrounding neighborhoods. The city undertook a number of public relations campaigns to mobilize support for this long-term project.[296]

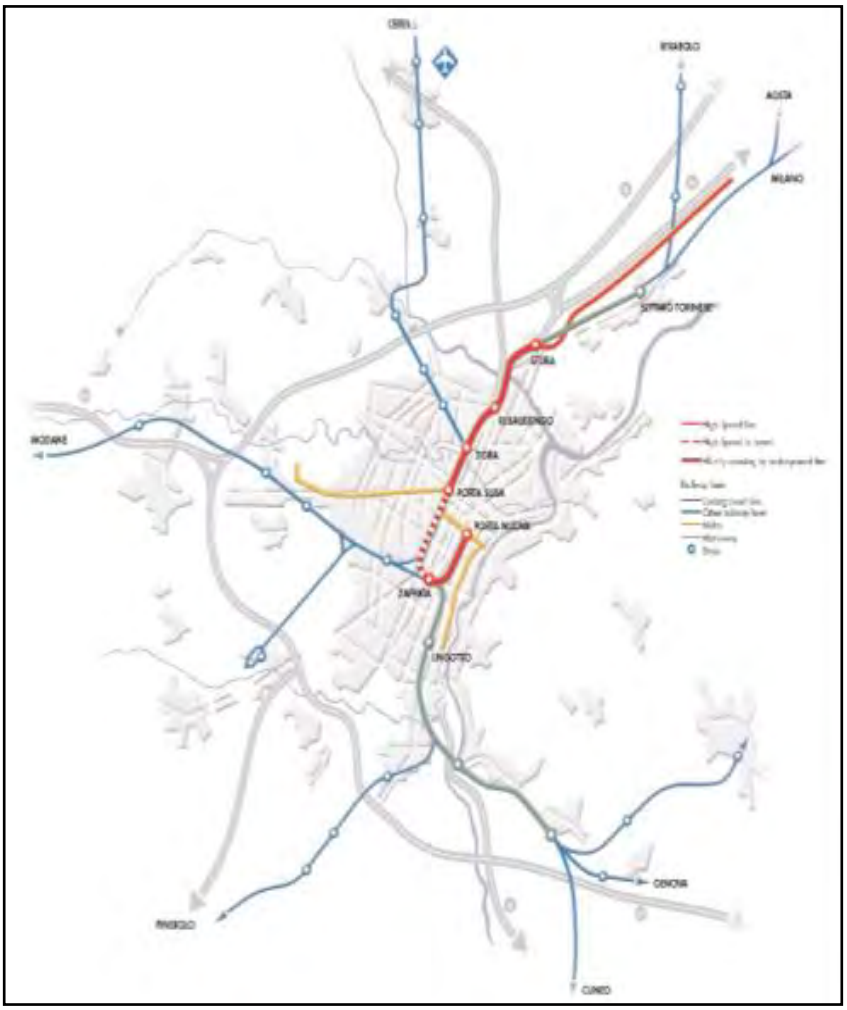

Figure 56. Map of Rail and Public Transportation Network Redevelopment Project

Source: RFI (2005).

Figure 57. Spina Centrale

Source: POPSU (*http://www.popsu.archi.fr/popsu-europe/turin/gares-tgv-et-dynamiques-de-renouvellement-urbain).*

STATION LAYOUT, ARCHITECTURE, AND USES

Station Façade

Torino Porta Susa is a long steel and glass building, 1,266 feet long and 100 feet wide, that runs alongside Spina Centrale (Figure 58 and Figure 59), although much of its functions occur below ground. The design is intended to evoke the lobby of a nineteenth century railway station or shopping gallery, but with a "modern twist."[297] Because the building evokes these historic forms, it allows a passerby to understand the building's use.[298] In fact, the building is the exact length of two HSR trains. RFI's project brochure from 2005 emphasizes the transparency and lightness of the building. These aspects are intended to, "give continuity to [the] historically interrupted urban area" formerly bisected by train tracks, and encourage people to pass through.[299]

Another unique and lauded aspect of the station is its glass walls, which contain photovoltaic cells and produce 680,000 kilowatts per year. The building is also cooled through natural convection from the lower levels of the station, and is heated with radiant floor panels. The building also won the European Solar Prize in 2013.[300,301]

Figure 58. View from Above Torino Porta Susa

Source: RFI (2005).

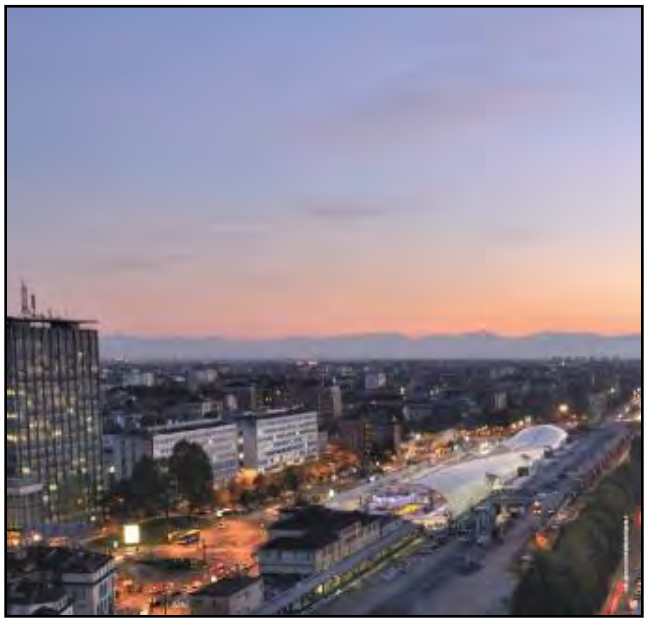

Figure 59. View of Torino Porta Susa from Above

Source: FS Italiane Group (2012).

Station Uses

AREP Group, Silvio d'Ascia, and Augustine Magnaghi won the competition to design Torino Porta Susa because of their concept's "simplicity and comprehensibility, as well as for the definition of an urban space which merges the functions of an important intermodal hub with attractive commercial services."[302] The design deliberately placed commercial uses, such as shops, services, and restaurants, on two terrace floors near the ground level to "establish urban continuity," while the lower levels contain the train platforms, tracks, and access to other modes.[303]

The station has five underground floors and almost 400,000 square-feet of floor space, although only one-third of this is dedicated to passenger and service functions. Overall, the station has four main areas:

1. Underground train platforms;

2. Traveler services area, including ticket office, waiting room, luggage storage area, and passenger information;

3. Commercial area; and,

4. Connections to the metro, bus services, and car parks.[304]

Station-District Integration

As mentioned previously, one of the primary goals of the station design was to unite the parts of the city previously bisected by rail lines. Although Spina Centrale and Corso Bolzano and the north-south connections are at different ground levels, passengers can easily move between all of the levels using ramps, escalators, staircases, and lifts.[305] In the pedestrian flow diagram of Figure 60, the blue walkways connect the passenger concourse–level -1–and platforms below–level -3, and the red walkways provide east-west connections.

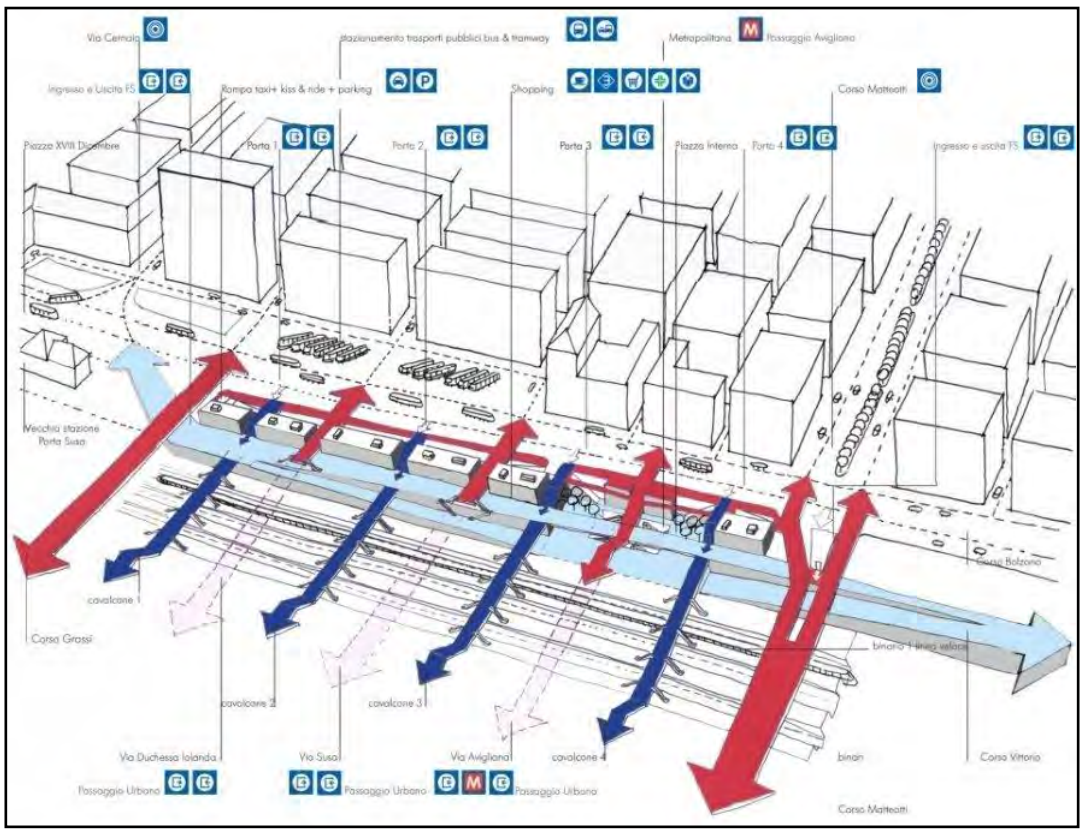

Figure 60. Pedestrian Flow Diagram for Torino Porta Susa

Source: POPSU (*http://www.popsu.archi.fr/popsu-europe/turin/gares-tgv-et-dynamiques-de-renouvellement-urbain).*

Parking

The station has 189 parking spaces, 107 long term, 60 short term, and 22 taxi spaces.[306] Some of this parking is accommodated in underground parking garages. The sidewalk around the station contains bicycle racks and motorcycle parking. There are also four bike-share stations, part of Torino's bike-share network '[To]Bike,' within a five minute walk of the station.[307]

STATION MODAL INTEGRATION

The City's general development plan included restructuring the city's public transportation system, with the broader goal of equalizing public and private transportation uses in the city. The redesign of the public transportation system had two parts: 1) build new rail lines, and, 2) develop new multi-modal station hubs.

The new rail lines that run through the city separate out different types of traffic. The eight-mile Turin line–almost five-miles of which is underground–separates long distance trains from regional and metropolitan traffic, allowing for improved service and better "integration of the mobility system with other modes."[308]

Torino Porta Susa is a multi-modal hub that serves metropolitan, regional, and international traffic. HSR, regional trains, metro, taxi, car parks, bus, trams, motorcycles, bicycles, and two vehicle roundabouts are all connected via pedestrian corridors within the station (Figure 61).[309,310] The station is also connected to the airport via a shuttle bus.

Figure 61. Section Rendering of Torino Porta Susa

Source: FS Italiane (2012).

EVALUATION AND LESSONS LEARNED

Torino Porta Susa was awarded the 2013 European Rail Congress prize for best European station. However, because the station is very new, little analysis has been done on the impact that it has had on the surrounding area. Nevertheless, we can draw a number of lessons that are pertinent for the Diridon Station.

The Torino Porta Susa station is an example of good station-area planning, as it incorporates many of the elements listed in Table 2 (Chapter 2). More specifically:

- There was significant public sector involvement and investment in the project, which reduced the risk for private investors, and spurred private investment and development in the station area.

- There was strong coordination of different actors and cooperation between the rail-road company and the City. By working with, and making agreements with RFI early in the planning process, the City was able to combine the company's plans to increase rail capacity with its urban development goals, leading to the City's 1995 development plan.[311]

- The plans perceived the station as both a "route" and a "place":[312] a major transit hub for the efficient movement of people and an attractive and central place in a high-density area for people to work, shop, or pursue entertainment activities.

- The City took a creative approach to urban design by, "identify[ing] a need for change and project[ing] this entirely on what it calls the railway area."[313] The City placed emphasis on creating a strong urban design plan for the whole station area, organizing and carrying out an international design competition.

- The design eliminated the station's barrier effect by burying more than eight miles of tracks underground, effectively integrating the station with its surrounding area.

- Even in a built-up urban area, the City was able to amass land for redevelopment and high-density land uses by identifying and consolidating underutilized parcels of land.

- The station-area plan densified uses around the station, attracting commercial, office, educational, and cultural facilities.

- Great emphasis was placed on the architecture of the station building itself with the goal of creating a distinctive, aesthetically pleasing, and high-quality structure, but also a "smart," energy-efficient building.

- Lastly, but importantly, great emphasis was placed on enhancing and improving the railway services, but also connecting rail with other transportation modes.

In the end, the development of the station and its surroundings is a strong boost for the realization of Torino's goal of becoming an international city.

V. CONCLUSIONS AND RECOMMENDATIONS

This study relied on three important sources of information to draw lessons for station-area planning in San Jose: 1) the existing scholarly and professional literature–summarized in Chapter 2; 2) a review of the existing planning and policy landscape and interviews with knowledgeable local stakeholders–presented in Chapter 3; and, 3) case studies of five successful European HSR stations selected from a long list of twenty cases –presented in Chapter 4. Collectively, these sources indicate that successful HSR station-area planning should be characterized by three types of connectivity: *spatial connectivity, intermodal connectivity*, and *operational connectivity.* How can San Jose Diridon achieve these three types of connectivity?

SPATIAL CONNECTIVITY

Spatial connectivity denotes a seamless integration of the station with its surroundings. Such integration should be both physical and perceptual. Physical integration requires strong linkages of the station with the downtown and the other station-surrounding neighborhoods, and softening of the barrier effect between the station and its neighborhoods. Perceptual integration requires that the station is perceived as an integral part of the city, a place where people may live, work, or shop, in addition to using it for their travel needs. Good urban design is instrumental in achieving spatial connectivity. And, as we saw in some European examples, iconic station architecture can help the city's image and identity building. The image that a station conveys, combined with the type of services it offers, affect its perceptual connectivity.

At the Diridon station building:

- Architectural design should incorporate and aesthetically integrate the existing historic station, but also expand significantly the station's space and facilities. The six case studies showed that unlike airports that are inward-oriented structures, the design of a railway station should connect well to its immediate surroundings, and the same should happen at Diridon.[314] Having the station building open up to a major plaza on the east side, as is currently being considered, would enhance the spatial connectivity of the station with its immediate surroundings. At the same time, the visual and physical connections of the station building to the neighborhood on the west should also be considered, so that the station building does not end up having a "good/front" and a "bad/back" side. Lessons from the Rotterdam case study on how to design two very different facades that are each appropriate to their respective spatial context provide particularly useful insights here.

- As the Rotterdam example indicates, a plaza can provide a great outdoor communal space for Diridon; it can serve for informal gatherings and more formal/planned events such as concerts, farmer's markets, etc. At the same time, station design may benefit from a great indoor hall or lobby–such as for example, the Denver Union Station lobby[315] shown in Figure 62–or the Utrecht station lobby shown in Figure 44.[316]

- The passenger flows from one station area to the other should be smooth and provide easy access to station platforms. Since Diridon would host different rail services, transfer passengers should be able to easily walk from one platform to the other.

- In addition to design, wayfinding and clear signage can help passengers navigate through the station, but also get information about destinations outside the station.

- Architectural design should consider how to bring ample natural light to the station interior.

- As was the case in all case study stations, Diridon station should have an ample provision of traveler services–ticketing and information booths, storage space, waiting spaces, etc.

- The station should also have a good provision of retail, entertainment, and cultural services. Many of our case study stations have incorporated successful malls and restaurants (see Figures 63 and 64).

Figure 62. Denver Union Station: Hotel and Railway Station Lobby

Source: http://images.adsttc.com/media/images/5567/a9a3/e58e/cecc/6c00/0088/large_jpg/Denver_Union_Station_Great_Hall_Chad_Chisholm.jpg?1432856988

Figure 63. Hoog Catharinje Shopping Center in the Utrecht Station Area

Source: Deike Peters.

Figure 64. Lyon Part Dieu Shopping Center

Source: http://groupe-6.com/media/img/system/photos/4da4242e2213bGroupe-6_Lyon_PartDieu_02.jpg

At the Diridon station neighborhood:

- Attention should be given to the placement of station entrances, so that they are well-accessed by the surrounding street network.

- Particular emphasis should be given to the pedestrian connections. Some of the best European stations are easily accessed on foot. Pedestrians should not have to walk through a sea of parking lots to reach the station.

- Parking facilities should be distributed to the surrounding neighborhoods. The proximity and ample parking that exists at Mineta International Airport provides an opportunity for shared-use parking between the station and the airport, as long as there is a convenient and free shuttle connection between the two.[317] Additionally, the City may also designate parking benefit districts in the neighborhoods surrounding the station, allowing metered parking in the neighborhoods, but use the revenue from parking meters for local improvements.[318,319]

- The selection of an appropriate land-use mix is critical for a vibrant station district. As we saw in the case studies, the types of land uses compatible with HSR services included office, commercial/retail, entertainment, and residential. The probable cancellation of the ball park development at Diridon offers the opportunity to develop more mixed-use–retail on the ground floor and medium-rise housing and offices on upper floors–in the station-adjacent neighborhood, which, along with the other office/commercial development, would encourage a 24/7 activity in the area. While housing will bring more residents into the Diridon station neighborhood, commercial and office land uses will help concentrate jobs, which is exactly what has happened in the station-adjacent areas of our European case studies.

- A major unknown and significant concern of local planners has to do with how the HSR tracks will approach the station—in a ground or aerial formation.[320] An aerial configuration that will likely be about sixty-five feet off the ground is more challenging to integrate in the surrounding fabric, but at the same time, there are precedents and examples from other places that may be useful for San Jose (see Figure 65). A number of design intervention typologies for elevated light rail stations are summarized in the article “Up in the Air” by one of the authors.[321] Architectural design will also play a significant role in making an elevated structure appear lighter and less bulky.[322]

Figure 65. Berlin's Rail Viaduct Carrying Commuter, Regional and High-Speed Rail

Source: http://hsr-prep.blogspot.com/2010/04/what-could-it-look-like.html

INTERMODAL CONNECTIVITY

Intermodal connectivity denotes the seamless integration of different transportation modes at the station, including walking and biking. It requires convenient access and transition from one mode to the other, and frequent services. All five case study-stations displayed a high level of intermodal connectivity. Achieving a strong intermodal connectivity at Diridon would require:

- Selection of appropriate location for a bus terminal at the station area.
- Expansion of bicycle-share and bicycle parking facilities.
- Utilization of the Mineta airport's car-rental services.
- Free shuttle connections to and from Mineta International Airport.
- Free and easy luggage transfer service from the Mineta airport to the Diridon station, and vice versa.
- Integrated ticketing among the different transit operators so that passengers can load on a "mobility card," giving them access to different transit services.

- Development of a station-based mobile application–'app'–that travelers can use to receive scheduling information, and purchase tickets for the different travel modes converging at the station.

- Digital panels at the station with real-time information about the arrival of upcoming rail services.

- Modest-size kiss-and-ride lots and distribution of parking in surrounding areas–including the airport, as already noted previously.

- Service integration and coordination of the schedules of different modes, so that there is round-the-clock activity at the station, as is typical in all the European examples presented.

OPERATIONAL CONNECTIVITY

Operational connectivity denotes good project governance, coordination and collaboration among different public sector agencies, and between the public and private sectors. As the European examples indicate, this would involve:

- Coordination of activities of the different public and transit agencies and other stake-holders. This is already happening, to some extent, at the Diridon through JPAB.

- Development of a Joint Powers Authority to manage the station development project with representatives from different agencies on its board of directors, who have executive, and not only advisory power. The French example of creating a public corporation–SPL–for the management and governance of HSR station-area development may be interesting and applicable to the California cases, and requires more attention and study–see also sections IV-I and IV-II.

- Consideration of different finance strategies–e.g., issuance of municipal bonds, station-area benefits districts, selling of certain public lands, etc.–for station-area improvements. This could help counteract the demise of the city's community redevelopment agency, and the loss of revenue through tax increment financing.

- Consideration of public-private partnerships and joint-development projects.

- A phased planning and development process that allows more flexibility, and can better respond to changing real estate markets and transportation system changes –e.g., increased ridership.

In conclusion, the transformation of Diridon Station through the arrivals of BART and HSR provides challenges, but also tremendous potential for San Jose. In the end, how the City's planners and policymakers respond to these challenges will determine if this potential is met in the years to come. We hope that this study, which has presented lessons from the experiences of other stations and from the collective wisdom of local experts, will be a modest step towards this direction.

APPENDIX A: HIGH-SPEED RAIL STATION PROFILES

Appendix A includes the profiles of the stations that were not chosen as case studies.

1) AMSTERDAM BIJLMER ARENA STATION

Amsterdam Bijlmer in the Netherlands was included in the initial long list of stations, because of its adjacency to the largest soccer stadium in the Netherlands, the Bijlmer ArenA, which holds 60,000 people. It is also right next to the Amsterdam ring freeway, and during the week, the ample parking at the ArenA is used as low-cost subsidized parking for commuters and visitors, who can park for as little as one euro, as long as, they also use the nearby regional rail line to commute into the city center. A very large shopping mall exists next to the parking structure. There are several large-scale housing projects near the area. The main reason this station was not selected as a detailed comparison is that this area is clearly a suburban sub-center that is not in walking distance to the main business districts of Amsterdam. The station also does not include HSR services, and, once it became clear the development of a major station-adjacent stadium would likely not be part of updated station plans in San Jose, this station example lost its relevance to the study.

Location	1102 Amsterdam-Zuidoost, Netherlands
Type of Project	New construction/rebuilding (completed in 2007)
Area of Development	75,347 sq. ft. (7,000m^2) Station building: 330 ft. long, 230 ft. wide, 98 ft. tall
Population	~835,000
Population Density	~12,700 per square mile
Expected Daily Transit Riders	N/A (no high-speed trains)
Types of Land Uses	Features 230 ft. wide pedestrian walkway to connect communities on either side of the tracks Small food outlets inside (mainly fast food) Adjacent to the station is a 14-screen movie theatre, new event venue, and the largest shopping mall in the city High concentration of social housing nearby
Parking	Adjacent structure at the arena
Elevated	Yes, tracks cross over the city streets
Transportation Modes	5 platforms and 8 tracks (2 local metro, 6 trains) Bus station (6 local, 10 regional) Bike rental, repair, and parking Car sharing Taxi stand
Station Location in Relationship to Downtown	About 5 miles away Close to a motorway
Sports Facility Nearby	Yes, next to the 60,000 seat ArenA soccer stadium

2) AMSTERDAM ZUID

Amsterdam Zuid in the Netherlands is an interesting example, in that it is a railway station at a deliberately planned new business and residential district not too far from the center of Amsterdam, and in close proximity to Schipol Airport. The station was partially

inspired by London's Canary Warf and Paris' La Defense, and has a time horizon for its implementation, until at least 2040. It is not in walking distance from downtown, and not all of the infrastructure is in place yet, but there were enough parallels to the San Jose case to keep this station on the short list of examples for possible further study.[323] Ultimately, the authors decided against choosing this station, because its location in a cosmopolitan European capital did not make it an appropriate comparison to San Jose.

Location	Zuidplein 10a, 1077 XV Amsterdam, Netherlands
Type of Project	Rebuilding/expansion 2005-2006: existing platforms extended and a second platform built 2011-2012: Gustav Mahler Square entrance rebuilt to improve access, double bicycle parking, and add new retail; platforms were also extended Major planned future development to include expanding the station to improve flow throughout, burying the A10 ring road underground to improve access, increasing bike parking and passenger amenities
Area of Development	30,000 square feet – station only (measured using Google Maps)
Population	~835,000
Population Density	~12,700 per square mile
Expected Daily Transit Riders	80,000 per day Anticipated 250,000 per day following the 2017 expansion of the N-S metro line and growth on Schiphol-Amsterdam-Almere-Lelystad route
Types of Land Uses	Small grocery store, newsstand, pharmacy, retail and food
Parking	Underground parking underneath the adjacent World Trade Center Bike parking and repair station; free first 24 hours
Elevated	No, tracks at-grade; perpendicular roads cross below
Transportation Modes	2 Metro lines (1 coming in 2017) 1 tram line 6 ICE services 2 Sprinter services
Station Location in Relationship to Downtown	About 3 miles south of the city centre, along the ring road Connects to the city centre in 10 minutes and airport in 7 minutes by public transportation
Sports Facility Nearby	Yes, 1 mile (20 minute walk) to Amsterdam Olympic Stadium which seats ~22,000 people Also directly connected to the Amsterdam World Trade Center which includes 1.3 million square ft. of office space over 9 buildings

3) ARNHEM STATION

Arnhem Station is a recently rebuilt station in the Netherlands, and is the country's nineth busiest. Its striking re-design by UNStudio won much architectural acclaim,[324] and the station is notable for having a very high capacity for total transfers per day–around 110,000 passengers, compared to its total average ridership–around 55,000. The authors decided against completing a detailed case study of this station, however, because Arnhem is too small a city to be a suitable comparison for San Jose. Two other factors against choosing this station were that it was only very recently completed, and most of its station-adjacent development is not yet implemented.

Location	Stationsplein 10, 6811 KG Arnhem, Netherlands
Type of Project	New construction (2006-2015)
Area of Development	430,550 sq. ft. (40,000m^2)
Population	~150,000
Population Density	~4,000 per square mile
Expected Daily Transit Riders	~55,000 (current) ~110,000 (2020)
Types of Land Uses	Office space, shops, housing, a new station hall, a railway platform and underpass, a car tunnel, bicycle storage and a large parking garage
Parking	1,000 cars 4,500 bicycles
Elevated	No
Transportation Modes	ICE high-speed rail International, regional, and local rail Bus: local and regional Bike
Station Location in Relationship to Downtown	In the city centre
Sports Facility Nearby	No

4) AUGSBURG CENTRAL STATION

Augsburg in Germany is a very interesting station, as the city is in the process of giving its central station a major boost, transforming Germany's oldest continuously operational, historic station building into a state-of-the-art intermodal facility. The impetus for this project comes from the fact that German Rail is upgrading the section from Stuttgart to Munich, accommodating very high-speed service, and Augsburg is a mid-point of this section. Within Europe, this corridor is part of the high-priority Paris-Budapest Trans-European Network axis. There is some limited information about the project available in English and much more detail in German.[325] However, the delays that this long-planned rail station restructuring project has incurred means that nothing has been finalized yet, and lessons from this case would mainly come from studying its past decision-making. Augsburg will likely be an interesting comparison to watch for in the future.

Location	Viktoriastraße 1, 86150 Augsburg, Germany
Type of Project	Renovation (addition of underground tramway)
Area of Development	~183,000 sq. ft. (~17,000m^2)
Population	~275,000
Population Density	~4,900 per square mile
Expected Daily Transit Riders	~< 50,000
Types of Land Uses	Underground tramway (to be completed in 2022) Part of a larger "Project Augsburg City" plan ¼ mile long tram tunnel beneath the station's east side
Parking	Parking structures adjacent to the station but not in the station
Elevated	No

Transportation Modes	12 tracks: high speed and regional rail 3 tram lines and 5 buses; adjacent to bus station with 22 regional lines Station Design 3 parts: 1) central station area, 2) ticketing, 3) dining, shops and library Multi-modal infrastructure Platforms to be built below an underground ticket hall, to allow for a three-level interchange Further expansion between 2017-2022 to include a turning loop to allow trams to turn back into the city Future Plans ew tram Line 5 from Luitpoldbrücke station on Line 3 west of the main station to Klinikum via P+R Augsburg West
Station Location in Relationship to Downtown	0.6 miles; basically in the city centre

5) BARCELONA SAGRERA STATION

Barcelona Sagrera in Spain is one of Europe's largest urban megaprojects. Its scale and ambitions are quite larger than San Jose's, however, the station is not finished yet, so it is not the most suitable comparison case to learn from. There is a wealth of information about this project available online and in the pertaining academic literature, so interested parties in San Jose still have the option of monitoring and learning from this example in the future.[326] There has already been massive redevelopment in adjacent areas around the station, so some insights can be drawn from this already.

Location	Carrer del Pont del Treball, 08020 Barcelona, Spain
Type of Project	New construction (expected completion 2016)
Area of Development	Area measures 4,300,000 sq. ft. (400,000m^2) where 2,800,000 sq. ft. (260,000m^2) is the station Entire project: 1.7 million m^2 in built surface area, 1.2m m^2 still on hold
Population	~1.6 million Concurrent development included: District 22@ in Poblenou: 500 acres of converted industrial land to create 43 million sq. ft. of development, of which 80% are for business The final stage of the city's waterfront redesign Redevelopment of Plaza de La Glorias, the intersection of three of the city's main arteries
Population Density	~41,000 per square mile
Expected Daily Transit Riders	90 million annually
Types of Land Uses	Linear park: 100 acres, a large public area with civic and educational and sporting facilities Ground floor features shopping, and multimodal connections 2/3 of the area will include 13,000 housing units and over 7 million sq. ft. of office, commercial, hotels, offices, shopping, leisure facilities Unified by a large urban façade that will run the length of the park Architectural landmark at the heart of the development will be a tower in the middle of the park designed by Frank Gehry; about 970,000 sq. ft. including office, apartments, hotel and culture facilities

Elevated	Yes/No: tracks and platforms at many levels Below-grade design as to reduce barrier affects By burying many of the tracks underground, a new road configuration was designed to allow for better flow between either side of the station; distributing congestion, and reconnecting disparate neighbourhoods
Transportation Modes	High-speed rail: 1 of 3 AVE stations in Barcelona Local rail, metropolitan rail, regional rail; also will have a bus station and taxi stand
Station Location in Relationship to Downtown	3 miles away
Sports Facility Nearby	No

6) BERLIN SÜDKREUZ

Berlin Suedkreuz in Germany is one of the stations that the authors have already discussed in more detail in a previous MTI report.[327] This is a very interesting case study for examining modal integration, as it is a high-passenger volume transfer station, where most riders transfer from regional rail lines, and where drivers can most easily access high-speed rail trains. However, there is little development around the station. Few people step outside of the station into its surroundings, and it is most certainly not a destination station for Berlin visitors. Therefore, this station was not deemed as a good comparison for San Jose Diridon.

Location	General-Pape-Straße, 10829, Tempelhof-Schöneberg, Berlin, Germany
Type of Project	Large-scale rebuild (late 1990s to 2006) Sustainability features
Area of Development	~525,000 square feet
Population	~3.5 million
Population Density	~10,000 per square mile
Expected Daily Transit Riders	~89,000
Types of Land Uses	Station only
Parking	Parking structure; can purchase parking stall online
Elevated	Elevated tracks criss-cross over at-grade tracks
Transportation Modes	Interchange station (intercity, regional, and local service) Berlin Ringbahn and S-Bahn on upper deck (east/west) Anhalter Bahn and Dresder Bahn are at-grade (north/south) ICE and EuroCity trains Intelligent Mobility Station Südkreuz + E-Bus Line 204 Electric bicycles with the Call a Bike rental service Electric car sharing from Flinkster Bus line 204 from BVG drives electrically from Südkreuz to Zoologischer Garten Innovative customer service in the station building, such as an indoor navigation application 2 vertical wind turbines + 2 photovoltaic systems generate CO2-free electricity A micro smart grid helps optimize consumption and production Part of 30 core projects in the Berlin-Brandenburg International Showcase for Electromobility; federally funded

Station Location in Relationship to Downtown	4.5 miles south of the city centre Close proximity to freeway and big box stores (IKEA)
Sports Facility Nearby	No, but near a large community centre

7) COLOGNE-DEUTZ

Cologne Deutz is one of Germany's category one stations. It exhibits very high passenger volumes and high intermodal transfers between ICE High-speed trains and regional and local services. It is adjacent to the Cologne convention center, so passenger volumes fluctuate dramatically between event and non-event times. This station is also unusual in that it is roughly a mile from Cologne's main train station–the Hauptbahnhof, which sits right across the river Rhine. The authors considered that this station was not a good comparison case, because of its low overall user activity during non-convention times.

Location	Ottoplatz 7, 50679 Koln, Innenstadt, Cologne
Type of Project	New construction
Area of Development	54 acres of land, about 1.6 million sq. ft. of floor area
Population	~1 million
Population Density	~6,700 per square mile
Types of Land Uses	2600 ft. moving walkway connects passengers to the nearby Cologne Main Station (across the river) Glass roof of 400 ft. to span the entire station building Shopping area connects the underground light rail to the next station over (Laxness Arena)
Parking	None; nearest lot located at the Cologne Trade Fair Grounds
Elevated	Yes, tracks cross over city streets
Transportation Modes	6 ICE high-speed routs 8 regional express lines 4 S-Bahn routes (regional commuter) 5 local services Light rail Stadtbahn station below tracks 1-10; serves lines 1 and 9; pedestrian connection to lines 3 and 4 that leave out of the neighbouring station (that serves the arena)
Station Location in Relationship to Downtown	At the city centre
Sports Facility Nearby	Yes, beside Lanxess Arena – with seating for 20,000 people And near the Cologne Trade Fair Grounds (to the north)

8) ERFURT STATION

Erfurt in Germany is one of Europe's best examples of a highly integrated, intermodal station. Eidlin already includes a very good assessment of this station.[328] The authors have also examined this station in a previous report. The station was reconfigured to allow for a high-degree of intermodality with local trams and buses. Passengers enjoy barrier-free and/or elevator access to all tracks, as well as, a number of services inside the station.[329] The reason Erfurt is not the best comparison for San Jose Diridon is because of this city's small size and medieval character.

Location	Willy-Brandt-Platz 12, 99084 Erfurt, Germany
Type of Project	Historic restoration/rebuilding, new construction
Area of Development	~97,000 sq. ft.
Population	~200,000
Population Density	~2,000 per square mile
Expected Daily Transit Riders	~35,000 (2006)
Types of Land Uses	Station only
Elevated	No; track at-grade
Transportation Modes	ICE high-speed rail 10 platforms 4 trams lines (street car) 1 city bus line Several regional buses
Station Location in Relationship to Downtown	0.6 miles away
Sports Facility Nearby	Yes; station is about 1 mile away from Steigerwaldstadio, a multipurpose stadium that seats ~20,000 people and is used for football

9) GRAZ HAUPTBAHNHOF

Graz Main Station in Austria is a comprehensive rail station area restructuring project that will have huge ramifications for this medium-size city. The station was rebuilt in 2015 with a new station plaza. However, the entire project is neither large, nor high-profile enough to be comparable to San Jose, which is a much larger city than Graz.

Location	Europaplatz, 8020 Graz, Austria
Type of Project	Major renovation beginning in 2001; expected completion 2020
Area of Development	~825,000 square feet
Population	~270,000 (city)
Population Density	~5,500 per square mile (city)
Expected Daily Transit Riders	~40,000
Types of Land Uses	Station Underground station (local) At-grade station (high speed) Park/plaza Bus terminal Hotel/Shops Proposed Development: 2 New Districts Rail Station City Graz Mix of residential, office, hotel, shopping with direct access to rail platforms 175,000 square feet in development area Railway Station Belt Mix of hotel, office, business and services in a mostly 2-story development with 74 ft. tall main building 100,000 square feet in development area
Parking	24-hour car park operated privately
Elevated	High speed rail tracks at grade with pedestrian walkway underneath

Transportation Modes	Tram: routes 1, 3, 6 and 7 Bus: city and regional lines, and international bus lines Train: S-Bahn Steiermark, national and international connections
Station Location in Relationship to Downtown	1.2 miles west of the city centre; connected by tram
Sports Facility Nearby	No

10) INGOLSTADT MAIN STATION

Ingolstadt in Germany is a recently renovated train station that is of more modest size than most of our cases in the long list. It was selected to match the projected passenger volumes at Diridon of around 30,000 daily passengers, but the city itself, and its land use and real estate markets, are simply too modest in size to be a suitable comparison for the anticipated transformative changes that HSR is expected to bring to San Jose. There is now also talk about razing the station and rebuilding it completely.

Location	Ingolstadt Hbf, Bahnhofstr. 8, 85051 Ingolstadt
Type of Project	Comprehensive remodel to allow for ICE lines
Area of Development	New construction (2008-2013)
Population	~ 129,000
Population Density	~ 2,500 per square mile
Expected Daily Transit Riders	~30,000 per day
Types of Land Uses	Bakery, small grocery store, bookstore, and florist Restaurant and beer garden Hotel: in 2009 Deutsche Bahn sold a 25,000 sq. ft. site north of the station for the construction of an InterCity Hotel which opened in 2014; the sale of the land was supposed to help finance some of the new station construction
Parking	1,227 car parking (fee required) 440 bicycle parking 800 of the car parking spaces are located in an 8-story facility which includes services like dry cleaning and key-cutting; the other 300 spaces are accommodated in another neighboring structure
Elevated	No, at grade
Transportation Modes	7 platform tracks 4 ICE services 17 Regional services (8 Regionalbahn, 3 Agilis, 6 Regional-Express) Modern bus station in front of the station serving 13 bus lines 4,000 passengers use the bus transfer station Taxi stand integrated into bus station Car rental in adjacent parking structure
Station Location in Relationship to Downtown	South of the Danube River; 1.5 mile away (30 minutes on foot, though there is another station on the other side)
Sports Facility Nearby	Yes; beside Tuja-Stadion which has 11,418 capacity but is no longer used by the main football team

11) LIÈGE-GUILLEMINS STATION

Liege Guillemins in Belgium was celebrated at its opening as a station that is a destination in its own right.[330] Its iconic architecture by architect Santiago Calatrava does not have a façade in the traditional sense, and is open to all sides. The station was intended to connect the different sides of the city rather than divide;but, the main reason to exclude this destination from the short list, is that the station has not yet developed high intermodal connectivity and rail-adjacent new urban development.

Location	Liège, Brussels 2 Place des Guillemins, 4000
Type of Project	Completely new, replaced the old station; completed in 2009
Area of Development	~375,000 square feet (measured station only)
Population	~200,000 (city) ~600,000 (metropolitan area)
Population Density	~7,300 per square mile (city)
Expected Daily Transit Riders	~36,000
Types of Land Uses	Station 9 tracks 5 platforms; 3 of which can accommodate HSR Some commercial, including: restaurants/bars, clothes shop, florist, food, small supermarket, newsagents Area Around Station (proposed) 52-acre new mixed-use district 500 residential units 1.1 million square feet of office 27,000 square feet of retail 107,000 square feet of hotels Development will center on an esplanade envisioned as a 10-acre open space connecting the station, the new district, and a pathway over the Meuse River
Parking	850 underground (in station) 110 outdoor (car park) 710 indoor (car park)
Elevated	Tracks are at grade, pedestrian walkway is elevated over the tracks
Transportation Modes	Rail: both domestic and international services; served by Thalys, ICE, and InterCity, and is part of the North European High-Speed Network Bus: served by 9 lines Car: kiss-and-ride access; new design allows for access to adjacent motorway Bike: free parking, Blue-bike share, no direct connections to bike infrastructure
Station Location in Relationship to Downtown	1 mile, across the La Meuse (river)
Sports Facility Nearby	No

12) MÁLAGA MARIA ZAMBRANO STATION

Malaga Maria Zambrano in Spain was one of the cases covered in the authors' previous MTI report. The intermodality of this station is helped by the new metro stop that opened under the station in 2014, as well as, the bus station that is located nearby. The station's proximity to the port, and its direct connection to the airport, increase its connectivity and intermodality.[331] The fact that this station has already been studied by the authors, combined with its proximity to the port, makes it dissimilar to San Jose, led to its exclusion from the short list of case studies.

Location	Explanada de la Estación, S/N, 29002 Málaga
Type of Project	New construction (2004-2007), opened in 2007; on the same site as the historic (1863) station New station marked the arrival of high-speed rail
Area of Development	~400,000 square feet
Population	~600,000 (city) ~1.2-1.6 million (metropolitan)
Population Density	4,000 per square mile (600,000/150 square miles)
Expected Daily Transit Riders	2009: 4.67 million riders Since adding high speed rail, the number of riders has doubled
Types of Land Uses	Hotel with 222 rooms Shopping centre: 30,000 square feet and 121 stores including a 10-screen theatre Bus station adjacent
Parking	1,500 parking spots 250 ground level and 1,250 underground pay parking AVE Club or First Class train tickets include 24hr (one-way) or 48hr (return) parking A cheaper alternative is to park at the airport and take the train to the station and transfer
Elevated	No, tracks are at-grade (car traffic crosses over the tracks)
Transportation Modes	11 tracks 1-5 are high speed AVE service 7-8 are medium to long distance 9 to the port 10-11 are underground local service (and to airport) 10 local bus lines 4 car rental companies
Station Location in Relationship to Downtown	About 1.5 miles southwest of city centre Also 1.2 miles from the port, and 5.5 miles from the airport
Sports Facility Nearby	No

13) MARSEILLE SAINT-CHARLES STATION

St. Charles Station in Marseilles, France, is a high-speed rail station that was built around an entirely new district, set up not too far from the city center. The station overcame a number of institutional challenges, with many stakeholders having to come together to bring this megaproject to fruition. Its relatively long history and ongoing planning process, in connection with the Euromediterrane process, makes this an interesting case study. The 480-hectare development area is significantly larger than San Jose's station area; however, this also includes areas adjacent to the city's commercial and the historic ports.

Location	Square Narvik, 13232 Marseille, France
Type of Project	Restored historic building, and new construction expansion; completed in 2007 Construction of Honnorat Hall and a large public plaza in the front overlooking the city
Area of Development	740 acres
Population	~850,000
Population Density	~9,200 per square mile
Expected Daily Transit Riders	~42,500 (calculated from annual figure), or 36,000 15.5m passengers in 2008
Types of Land Uses	Surrounding area is very mixed use, including commerce, tertiary services, military facilities, and education HSR brought in hotels, services, and commercial activities Honnorat Hall: is a 11 mile long, street-like area inside the station which houses restaurants, newsstands, and other small shops
Parking	Original parking structure upgraded to fit 1,000 cars Additional structure constructed under Honnorat Hall in order to accommodate new traffic generated by improved car access
Elevated	No, tracks at-grade
Transportation Modes	Designed a multi-modal hub, including regional trains, buses, two metro lines, two parking structures, a taxi-stand, and public bikes New bus station to accommodate 350 buses per day, serving almost all local and regional lines Metro underneath the main building, sees 28,000 passengers per day Gives access to: 16 rail tracks, 20 bus spaces, 2 metro lines, 2 kiss-and-ride areas, a taxi stand, shuttle buses, and improved linkages to city streets
Station Location in Relationship to Downtown	10 minute walk from the city centre
Sports Facility Nearby	10 minute train ride from Le Dome, a 8,500 seat venue

14) MUNICH-PASING

Munich Pasing station in Germany was considered initially, because its passenger volumes are similar to those of San Jose Diridon, with a heavier emphasis on regional rail commuters–~65,000–than longer distance rail–up to another 20,000. The station-surrounding area is of a less central urban character, and HSR service is infrequent.

Location	Pasinger Bahnhofsplatz 9 81241 Munich
Type of Project	Station capacity expansion; tracks moved and replaced (1951-1958) Gradual improvements/expansions over time
Area of Development	40,000 square feet (station building surface area)
Population	~1.4 million
Population Density	~12,000 per square mile
Expected Daily Transit Riders	85,000 (of which 65,000 are S-Bahn passengers)
Types of Land Uses	A few restaurants and shops inside the station (see plan) Adjacent shopping centre: Pasing Arcaden
Parking	250 car parking (fee required) 2013 bicycle parking
Elevated	Perpendicular roads go under the tracks, but surrounding areas at the same grade

Transportation Modes	9 platforms and 5 through tracks serving ICE, 5 S-Bahn, and Intercity trains with high-speed and regional routes 6 bus lines 1 tram line within walking distance Taxi stand
Station Location in Relationship to Downtown	About 6 miles east of downtown
Sports Facility Nearby	No

15) ZARAGOZA DELICIAS STATION

Zaragoza Delicias station in Spain was another possible comparison case that the authors profiled in the previous MTI report. The station has been operational since 2003, and is very large, compared to the rest of the city fabric. Surrounding real estate development has been lagging, however. Another significant departure from the San Jose case is this station's adjacency to a large, busy long-distance bus terminal, which aids its intermodality, but makes its intermodal connections quite different from those anticipated at the San Jose Diridon, likely to focus on integrating different rail modes and strengthening connections to the city center.

Location	50011, Zaragoza, Spain
Type of Project	New construction; station completed in 2003 with adjacent bus station completed in 2007 Built as a multi-modal station
Area of Development	46 acres of land area Interior space = 1,969 ft. x 5,490 ft., three floors Main deck = 430,550 sq. ft.
Population	~ 650,000
Population Density	~ 1,800 per square mile
Expected Daily Transit Riders	In 2011 it had more than 3 million travelers
Types of Land Uses	Adjacent to station: Railway Museum and a transportation-themed park Restaurants and services inside station (see plans)
Parking	0.6 miles to nearest parking
Elevated	No
Transportation Modes	Madrid-Barcelona AVE high-speed rail; 10 tracks RENFE regional commuter trains 6 bus connections (City Bus, Intercity Bus, Tourist Bus) Taxi stand
Station Location in Relationship to Downtown	1.9 miles away; ~30 minutes by bus
Sports Facility Nearby	Not adjacent, but La Romareda (with capacity of ~35,000) is 3km away; but no good transit access

APPENDIX B: INTERVIEW QUESTIONS FOR EUROPEAN TRANSIT MANAGERS AND PLANNERS

STATION FACTS

1. How much was the station altered/rebuilt to accommodate the arrival of high-speed rail (HSR) trains? Was it enlarged, altered and/or completely rebuilt? What key factors influenced the decision–e.g. cost, train length, intermodal connections, etc.?

2. When was the HSR station completed? How many years did it take for the station to be completed?

3. What is the station's average ridership–how many people board and alight trains daily at the station? How much of this ridership is on HSR trains? Regular/regional/commuter trains? Are tram and bus users included in that number?

4. How many HSR trains pass through the station every day? How many other trains?

5. How far is the station from the city center–distance to major shopping/commercial area and to city hall?

6. If it is not in the city center, is it within another important center of economic activity within your metropolitan region?

7. What is the basic character of the station neighborhood–land uses, desirability, etc.?

GOVERNANCE: STATION PLANNING AND STATION DISTRICT PLANNING

1. Who owns the station?

2. Who manages the station?

3. Who is responsible for planning the station?

4. Who is in charge for planning in the station area–e.g. the city, a special administrative body, and/or who is in charge of the station district?

5. Who are the main and most powerful decision-makers in the overall planning process? Who is on the governing board of the main agency and to whom does the agency report?

6. Does the city have an official definition of the 'station district' and if so, how is it defined?

7. Is there a special station district plan in place? If yes, please respond to questions 2a-2f.

2a. What were the main goals of this plan?

2b. To what extent have these goals been realized? Please explain.

2c. What specific land uses has the plan sought to attract within the station district?

2d. Has the plan been fully implemented?

2e. How successful has the plan been in attracting new development around the station?

2f. Are transit-oriented development (TOD) plans/policies in place for the station district?

8. What has been the involvement of the private sector in the planning process?

9. Are there any public-private partnerships responsible for station- and station district development? Please explain.

10. Are there cooperation/service agreements between the rail authorities, transit agencies, station management bodies, or municipalities that serve your station?

11. What type of impact would you say that the introduction of the HSR station has brought to the area–major positive, moderate positive, moderate negative, no impact, etc.? Please explain.

STATION LAYOUT/ARCHITECTURE

12. Is the station building an elevated or an underground structure?

13. How does the station interface with its adjacent district? How many access points are there from the station to the neighborhood? Does the station have a clear front and back side?

14. How has urban design addressed the “barrier effect”–the separation of the station from the neighborhood, because of the railway infrastructure? Is the station itself intended to serve as a pedestrian link between the neighborhoods located adjacent to the station?

15. Does the architecture of the building enhance the image of the station? In what ways?

16. What type of uses–other than those related to travel–exist within the station?

17. What type of travel-related uses exist within the station?

18. Do you have a coordinated wayfinding and signage program for the station? Which organization or entity decides on the wayfinding and signage standards–e.g. national railway, city, regional government?

19. Are there designated waiting areas for long-distance passengers? What about luggage storage services?

20. Does your station design include–options for–infrastructure for safety checkpoints?

MODAL INTEGRATION

21. What are the primary modes of access to your HSR station–e.g. private car, bus, metro, taxi/car sharing, walking?

22. Do the HSR trains share platforms with other–national/regional–trains?

23. How easy and how comfortable is it to access the station on foot?

24. How far–how many minutes of walking–are the HSR platforms from connecting services?

    a. Other (long-distance or regional) rail (if not “yes” to answer above)

    b. Bus

    c. Metro or Light rail transit

    d. Taxi/Shuttles

    e. Car rental and/or car share facilities

    f. Bike share

25. Do you offer specific services or programs to facilitate door-to-door access via high-speed rail, and especially by non-auto modes?

26. Is your main/closest airport served by HSR?

27. If not, how is the airport connected to the HSR station?

28. Where do most passengers buy their HSR tickets–online, cell phone app, ticket booth, ticket machine?

29. Do passengers need a separate ticket for the HSR train or are the tickets integrated with other rail services? What about other transit services–buses, trams, etc.?

PARKING

30. Do you provide park-and-ride spaces for cars at the station? How many?

31. Is there free parking at the station? If there is only paid parking, how much does it cost? Do you have–or have you considered–instituting variably-priced parking to manage peak demand?

32. Has your city developed a regional remote parking plan that provides incentives for park-and-ride passengers to park their cars at more peripheral locations, away from the HSR station?

33. Have you developed policies for discouraging access to the station by car and encouraging access by more sustainable modes, including walking, cycling, and transit?

34. Do you have data on how many people regularly bike & rail and about how many use a bike to reach nearby destinations?

35. Do you have bicycle parking areas at the station? For approximately how many bicycles?

36. Do you use surface parking lots as interim land uses for land-banking purposes–meaning they are intended to be converted to higher-value uses later?

GENERAL EVALUATION

37. What are the biggest challenges of station district planning and development in your city/region–e.g. institutional, political, financial, local geography, etc.?

38. Do you have any recommendation on how to address these challenges?

39. What are the biggest challenges of station intermodality and good integration of HSR services with other modes?

40. Do you have any recommendation on how to address these challenges?

41. What are some important general lessons for good, well integrated HSR station planning that you learned from your case?

42. Besides the short information at the beginning of this questionnaire, do you know anything more about the plans to build HSR and new HSR stations in California? If so, how do you think it compares to your case? How do you think it may be different and why?

43. So what lessons should the planning of the Diridon Station in San Jose, extract from your station's experiences?

APPENDIX C: INTERVIEW QUESTIONS ABOUT DIRIDON STATION-AREA PLANNING

1. In what ways has the coming of HSR influenced station-area planning at Diridon Station? What do you consider as the challenges that the coming of the HSR poses for station area development (if any)?

2. What do you consider the specific opportunities that the coming of the HSR poses for station area development at Diridon?

3. How will the station be integrated with its immediate surroundings? How will the barrier effect be avoided?

4. Will the HSR station be an elevated structure? What innovative design solutions are being discussed? If the station is an elevated structure, how will the space underneath the tracks be utilized?

5. What do you think are a) the most likely and b) the best possible land uses for the area that was originally envisioned to be a new ball park?

6. Does the city desire to create a landmark station building (in terms of architecture)? If so, how will this be achieved (e.g. design competition, invitation of well-known architects, etc.)

7. Do you expect any changes to the officially suggested FARs for the Northern Innovation Zone, Central Commerce and Entertainment Zone and Southern Urban Neighborhoods Zone?

8. How many residential units are anticipated in each of the 3 zones? Will there be any affordable housing provided near the station? How? By whom? How much?

9. How many different public entities own land adjacent to the station? Does the city have any land consolidation strategies?

10. San Jose wants to bring more jobs in its downtown area? Are there any specific incentives that the city will offer to firms to locate in the station-area?

11. How much interest has the developer community shown in building in the station area? Are there any joint development project anticipated? Any public/private partnerships? Are there any anticipated incentives for developers to attract them to build in the station-area?

12. How is automobile parking going to be handled? Is it going to be scattered in different areas? How many parking spaces are anticipated (requested by CAHSRA) for the station? What about the lawsuit by the San Jose Sharks about their parking rights in the area?

13. How will alternative transportation means (especially walking and biking) be encouraged in the station district? What type of new infrastructure will be built for walking and biking? Specifically, how will you provide safe and convenient connections for cyclists and pedestrians to Downtown?

14. Will there be a bike station at Diridon? Where? What are the details?

15. What ways are being considered to increase the station's multimodality?

16. Can you elaborate a bit on the work of the Diridon Station Joint Policy Advisory Board? How do you evaluate the current level of coordination between the different public agencies (including the CAHSRA)? How would things change if there was a Diridon Station Joint Powers Authority?

17. In your view, what are the most important requirements that should be in place in order for the HSR to be a positive force for the Diridon area development?

18. What other key issues are most important to ensure that the new HSR becomes a success?

19. Please sum up your hopes for Diridon by briefly describing what you think the station district should look like in the future.

20. What do you think are the most important lessons that Diridon might learn from European high-speed rail stations?

ABBREVIATIONS AND ACRONYMS

ADIF	Administrador de Infraestructuras Ferroviarias
AREP	Amenagement, Recherche, Pole d'Echanges
BART	Bay Area Rapid Transit
BRT	Bus Rapid Transit
CEQA	California Environmental Quality Act
CHSRA	California High-Speed Rail Authority
DASH	Downtown Area Short Hop
DB	Deutsche Bahn
DS	Diridon Station
DSAP	Diridon Station Area Plan
EIR	Environmental Impact Report
EPA	L'établissement public d'aménagement
FAA	Federal Aviation Administration
FAR	Floor Ratio Area
FIRE	Finance, Insurance, and Real Estate
HSR	High-Speed Rail
ICE	InterCity Express
JPA	Joint Powers Authority
JPAB	Joint Policy Advisory Board
NEPA	National Environment Policy Act
NS	Nederlandse Spoorwegen
NSP	Nievwe Sleutelprojecten
RCD	Rotterdam Central District
RFI	Rete Ferroviaria Italiana
SEM	Société d'Économie Mixte
SNCF	Société Nationale des Chemins de fer Français
SPL	Société Publique Locale
SPUR	San Francisco Bay Area Planning and Urban Research Association
TGV	Train à Grande Vitesse
TOD	Transit-Oriented Development
UCP	United Civil Party
ULI	Urban Land Institute
VTA	Valley Transportation Authority

ENDNOTES

1. Cascetta, E. and Pagliara, F. (2008). “Integrated Railways-Based Policies: The Regional Metro System Project of Naples and Campagnia.” *Transport Policy.* 15: 81-93.

2. Cascetta, E., Papola, A., Pagliara, F., and Marzano, V. (2011). “Analysis of the Mobility Impacts of the High-Speed Rome-Naples Rail using Within Dynamic Mode Service Choice Models.” *Journal of Transport Geography.* 19: 635-643.

3. Tapiador, F.J., Burckhart, K. and Marti-Henneberg, M. (2009). “Characterizing European High-Speed Train Status Using Intermodal Time and Entropy Metrics.” *Transportation Research Part A.* 43: 197-208.

4. *Diridon Station Area Plan. Final Plan Report.* (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33057 (accessed October 30, 2016).

5. *Diridon Station Area Plan: Implementation Strategy Report* (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33058 (accessed October 30, 2016).

6. See CHSRA website http://www.hsr.ca.gov/

7. Loukaitou-Sideris, A., Cuff, D., Higgins, H. (2013). *HSR Development: Planning for High Speed Rail in Southern California Communities.* Los Angeles: UCLA Lewis Center and CityLab.

8. Bruinsma, F., Pels, E., Priemus, H., Rietveld, P and van Wee, B. (2008). *Railway Development: Impacts on Urban Dynamics.* Heidelberg: Physical Verlag.

9. Terrin, Jean-Jacques, (2011). *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues).* Paris: Parentheses.

10. Loukaitou-Sideris, A., Peters, D., and Wei, W. (2015). *Promoting Intermodal Connectivity at California’s High-Speed Rail Stations*. San Jose: Mineta Transportation Institute.

11. Loukaitou-Sideris, A., Cuff, D., Higgins, T., and Linovski, O. (2012). “Impact of High Speed Rail Stations on Local Development: A Delphi Survey.” *Built Environment* 38(1): 51-70.

12. Loukaitou-Sideris, A., Cuff, D., Higgins, T., and Wenbin Wei (2012). *Planning for Complementarity: An Examination of the Role and Opportunities of First-Tier and Second-Tier Cities along the High-Speed Rail Network in California.* San Jose: Mineta Transportation Institute.

13. Loukaitou-Sideris et al. (2013).

14. Peters, D. (2009). The Renaissance of Inner-City Rail Station Areas: A Key Element in Contemporary Urban Restructuring Dynamics. *Critical Planning*, 16, 163-185.

15. Novy, J., & Peters, D. (2012). Railway Station Mega-Projects as Public Controversies: The Case of Stuttgart 21. *Built Environment*, 38(1), 128-145.

16. Chang. J., Ni, J. and Lai, R. (2012) "High-Speed Rail in Asia: The Taiwan Experience." Paper presented at the UC Berkeley Center for Environmental Public Policy Int'l Expert Symposium on High-Speed Rail and Sustainability, Berkeley, CA, November 29, 2012.

17. Sanchez-Borras, M., Robusté, F. and O. Criado, (2011). "High-Speed Railways in Spain," *Transportation Research Record*, 2261, 1–17 <doi:10.3141/2261-05>.

18. Ureña, J., Benegas, M., and Mohino, I. (2012) "Socioeconomic, Territorial and Sustainability Lessons from Developing High-Speed Rail in Spain." Paper presented at the UC Berkeley Center for Environmental Public Policy Int'l Expert Symposium on High-Speed Rail and Sustainability, Berkeley, CA, November 29, 2012.

19. Terrin, Jean-Jacques (2011). *Railway Stations and Urban Dynamics: High-Speed Issues.* Paris: Parentheses, p. 12.

20. Bertolini, L. and Spit, T. (1998). *Cities on Rails: The Redevelopment of Railway Station Areas*. New York: E&FN Spon.

21. Van den Berg, L. and Pol, P. (1998). *The European High-Speed Train Network and Urban Development: Experiences in Fourteen European Urban Regions.* Aldershot: Ashgate.

22. Bruinsma, F. Pels, E., Priemus, H., Rietvield, P. and van Weer, B. (2008). *Railway Development: Impacts on Urban Dynamics.* Heidelberg: Physical Verlag.

23. Bertolini, L. Carrey, C., and Renne, J. (2012). "Station Area Projects in Europe and Beyond: Towards Transit Oriented Development?" *Built Environment.* 38(1): 31-50.

24. Peters, D. and Novy, J. (2012). "Train Station Area Development Mega-Projects in Europe: Towards a Typology" *Built Environment,* 38(1): 12-30, p. 6.

25. Ibid.

26. Bertolini et al. (2012).

27. Bellet, Carmen (2014). *The Introduction of the High Speed Rail and Urban Restructuring: The Case of Spain* (Lleida, Spain: University of Lleida). http://www.researchgate.net/publication/237543696_The_introduction_of_the_high_speed_rail_and_urban_restructuring_the_case_of_Spain (accessed October 15, 2015).

28. Terrin 2011, p. 26.

29. Pol, P. (2002). *A Renaissance of Stations, Railways, and Cities: Economic Effects, Development Strategies, and Organizational Issues of European High-Speed Train Stations.* Delft: Delft University Press.

30. Loukaitou-Sideris, A. (2013). "New Rail Hubs along the High Speed Rail Corridor in California: The Urban Design Challenges." *Transportation Research Record,* 2350-01:1-8.

31. Bertolini et al. (2012).

32. Ibid, p. 36.

33. Peters and Novy (2012).

34. Bellet (2014).

35. Loukaitou-Sideris (2013).

36. Bertolini et al. (2012).

37. Eidlin, E. (2015). *Making the Most of High Speed Rail in California: Lessons from France and Germany.* The German Marshall Fund of the United States.

38. Loukaitou-Sideris, A., Cuff, D., Higgins, H. and Wei, W. (2012). *Planning for Complementarity: An Examination of the Role and Opportunities of First-Tier and Second-Tier Cities along the High-Speed Rail Network in California"* San Jose: MTI Report 11-17.

39. Van den Berg and Pol (1998).

40. De Jong, M. (2007). *Attractiveness of HST Locations: Eight Cases in Northwest Europe*, master thesis, University of Amsterdam.

41. Bertolini et al. (2012).

42. Peters and Novy (2012).

43. Bertolini and Spit (1998).

44. Bertolini et al. (2012, p. 34).

45. Kloosterman, R., & Trip, J. (2006, July 6–8). "Planning for Quality? Assessing the Role of Quality of Place in Developing High-Speed Railway Stations." Paper presented at International Conference on Urban Conditions and Life, Amsterdam, p. 2.

46. Bertolini and Spit (1998).

47. Bertolini, L. (2008). “Station Areas as Nodes and Places in Urban Networks: An Analytical Tool and Alternative Development Strategies.” In F. Bruinsma, E. Pels, H. Priemus, P. Rietveld, & B. van Wee (Eds.), *Railway Development* (pp. 35–57). Leipzig, Germany: Springer-Verlag.

48. Bertolini and Spit (1998).

49. Bertolini and Spit (1998) indicate that a timeframe of ten years is common. Eidlin (2015) discusses a twenty-year timeframe for station-area development.

50. Ibid, p. 163.

51. Bertolini et al. (2012).

52. Bertolini and Spit (1998).

53. Nuworsoo, C. and Deakin, E. (2009, January 11–15). “Transforming High-Speed Rail Stations to Major Activity Hubs: Lessons for California.” Paper presented at meeting of the Transportation Research Board, Washington, DC.

54. Loukaitou-Sideris, A., Cuff, D., Higgins, T., & Linovski, O. (2012a). “Impact of High Speed Rail Stations on Local Development: A Delphi Survey.” *Built Environment*, 18(1), 51–70.

55. Cervero, R., and Bernick, M. (1996). *High-Speed Rail and Development of California’s Central Valley: Comparative Lessons and Public Policy Considerations.* Working paper, Institute of Urban and Regional Development. Berkeley: University of California.

56. Eidlin (2015).

57. Cascetta, E., Papola, A., Pagliara, F., & Marzano, V. (2011). “Analysis of Mobility Impacts of the High Speed Rome-Naples Rail Using within Dynamic Mode Service Choice Models.” *Journal of Transport Geography*, 19, 635–643.

58. Tapiador, F. J., Burckhart, K., & Martı´-Henneberg, M. (2009). “Characterizing European High Speed Train Status Using Intermodal Time and Entropy Metrics.” *Transportation Research Part A*, 43, 197–208.

59. Cascetta, E., & Pagliara, F. (2008). “Integrated Railways-Based Policies: The Regional Metro System Project of Naples and Campania.” *Transport Policy*, 15, 81–93.

60. Kloosterman and Trip (2006, p. 2).

61. Kloosterman, R. and Trip, J. (2011). “Planning for Quality? Assessing the Role of Quality of Place in Current Dutch Planning Practice.” *Journal of Urban Design.* 16(4): 455-470.

62. Trip, J. (2008). “What Makes a City: Urban Quality in Euralille, Amsterdam South Axis and Rotterdam Central.” In F. Bruinsma, E. Pels, H. Priemus, P. Rietveld, & B. van Wee (Eds.), *Railway development* (pp. 79–99). Leipzig, Germany: Springer-Verlag.

63. Loukaitou-Sideris (2013).

64. Willigers, J. and van Wee, B. (2011). High-Speed Rail and Office Location Choices. A Stated Choice Experiment for the Netherlands. *Journal of Transport Geography*, 19, 745–754.

65. Dovey, K. (1998). “Multiplicities and Complicities: Signifying the Future at Euralille.” *Urban Design International*, 3, 89–99.

66. Cervero and Bernick (1996).

67. Bertolini et al. (2012).

68. Murakami, J. and Cervero, R. (2010, December 2–3). *California High-Speed Rail and Economic Development: Station-Area Market Profiles and Public Policy Responses*. Paper presented at a symposium, University of California, Berkeley Faculty Club.

69. Loukaitou-Sideris et al. (2012).

70. Ibid.

71. SPUR (2011). *Beyond the Tracks: The Potential of High-Speed Rail to Reshape California’s Growth.* San Francisco: SPUR Report, January 2011, https://www.spur.org/sites/default/files/publications_pdfs/SPUR_Beyond_the_Tracks.pdf (accessed June 13, 2016).

72. BMS Design Group + Kimley Horn Associates (April 2010). *The Alameda. San Jose: prepared for the San Jose Redevelopment Agency and Caltrans. http://www.sjredevelopment.org/TheAlamedaTransportationImprovements/TheAlamedaPlan.pdf* (accessed October 30, 2016).

73. Ibid p.1-1.

74. Ibid p.1-1.

75. *Diridon Station Area Plan: Existing Conditions Report* (2010). San Jose. http://www.sanjoseca.gov/DocumentCenter/View/1629 (accessed October 30, 2016).

76. *Diridon Station Area Plan: Alternatives Analysis Report.* (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/1614 (accessed October 30, 2016).

77. Interview with Jessica Zenk, October 11, 2016.

78. *Diridon Station Area Plan. Final Plan Report.* (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33057 (accessed October 30, 2016).

79. Urban Land Institute (September 2010). California High Speed Rail TOD Market Place. http://sf.uli.org/wp-content/uploads/sites/47/2011/05/HSR-TOD-TAPs-Final-Report.pdf (accessed October 30, 2016).

80. SPUR (March 2014). *The Future of Downtown San Jose.* http://www.spur.org/publications/spur-report/2014-03-17/future-downtown-san-jose (accessed October 30, 2016).

81. SPUR 2014, p. 4, also see pages 60-61 for a complete list of recommendations and the parties responsible for implementing them.

82. JD Powers led the environmental work, ARUP led the station work, and Field Paoli led the station area work.

83. Interview with Frank Fuller, October 24, 2016.

84. *Diridon Station Area Plan: 10-Year Horizon Analysis* (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33059 (accessed October 30, 2016).

85. *Diridon Station Area Plan: Implementation Strategy Report* (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33058 (accessed October 30, 2016).

86. *Diridon Station Area Plan: Integrated Final Program Environmental Impact Report* (August 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/34120 (accessed October 30, 2016).

87. DSAP 2014, p.1-5.

88. DASP 2014, p. 1-9.

89. DASP 2014, p.1-10.

90. Interview with Jessica Zenk, October 11, 2016.

91. Ibid.

92. DSAP (2014, p. 1-11).

93. VTA, “Phase II: Future BART Stations,” http://www.vta.org/bart/stationsphaseII (accessed September 15, 2016).

94. Flyvbjerg , B., Bruzelius, N., and Rothengatter, W. (2003). *Megaprojects and Risk: An Anatomy of Ambition.* Cambridge: Cambridge University Press.

95. Ibid.

96. Interview with Ben Tripousis, September 24, 2016.

97. Loukaitou-Sideris, A. Peters, D. and Wei, W. (2015). *Promoting Intermodal Connectivity at California’s High-Speed Rail Stations.* San Jose, CA: Mineta Transportation Institute, Research Report 12-47.

98. German Railways (aka Deutsche Bahn, DB) allows the full integration of different modes of travel, including high-speed trains, through the use of one ticket. The ticket can be bought by internet portal or by phone. For smartphone users, there is also the DB Navigator app. It is also possible to purchase tickets on the train itself. The DB cards are pre-purchased personalized frequent traveler cards that give either a 25 or 50% discount on customer’s entire trips, including the high-speed rail portion, and there is a 100% version that gives customers free access to *all* DB trains for the entire year. The cost for a (second class) BahnCard 100 was 4090 Euros in 2016. For details, see https://www.bahn.com/i/view/GBR/en/prices/germany/bahncard.shtml

99. See Table 2-3 in City of San Jose 2014a, p. 2-13.

100. Interview with Ben Tripousis, September 24, 2016.

101. At the time of the submission of this research proposal, the prospect of using the southern portion of the station area to build another sports stadium was still open. Since it is now unlikely that the city will develop a new ballpark in the station-area, this criterion was subsequently eliminated in the search for case study comparisons.

102. The HSR tracks are actually two levels below the traditional street level, but are at the same (ground) level as the lowest point of Place Francois Mitterrand.

103. Bertolini and Spit (1998).

104. Eidlin, Eric. 2015b. “On High-Speed Rail, City Building, and a Visionary French Mayor: The Case of Lille.” The German Marshall Fund of the United States. http://www.gmfus.org/blog/2015/03/30/high-speed-rail-city-building-and-visionary-french-mayor-case-lille (accessed October 28, 2016).

105. Bertolini and Spit (1998, p. 61).

106. Bertolini and Spit (1998).

107. Lille Office de Tourisme et des Congress. (2016). Lille 2016 Press Kit. http://dk.media.france.fr/sites/default/files/document/press_kit/DP%20Lille%20gb-2016-787.pdf (accessed October 15, 2016).

108. Bertolini and Spit (1998).

109. Ibid.

110. Ibid.

111. SNCF Open Data. "Fréquentation en gares en 2014", 2016. https://ressources.data.sncf.com/explore/dataset/frequentation-gares/table/?q=Lille+Europe&sort=-volume_total_d_usagers_2014_voyageurs_non_voyageurs (accessed September 18, 2016).

112. Ampe, Francis (2011). "Lille: Gare D'Euralille (Lille: Euralille Station)." In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 52-67. Paris: Parentheses.

113. Bertolini and Spit (1998).

114. Lille Office de Tourisme et des Congress (2016).

115. Lille-Flandres was designed as a cul-de-sac station, meaning it only accommodated end of the line traffic.

116. Bertolini and Spit (1998).

117. Ibid, p. 63.

118. Bertolini and Spit (1998).

119. Bertolini and Spit (1998, p. 66).

120. Eidlin, E. (2015a).

121. Tripp, J.J. (2009). "What Makes a City: Urban Quality in Euralille, Amsterdam South Axis and Rotterdam Central" In Bruisma et al. (eds.) *Railway Development: Impacts on Urban Dynamics.* (pp. 79–99). Leipzig, Germany: Springer-Verlag.

122. According to Bertolini (1998), an SEM can control development but is not fully responsible for the outcomes.

123. Pol, P. (2008). "HST Stations and Urban Dynamics: Experiences from Four European Cities." In Bruisma et al. (eds.) *Railway Development: Impacts on Urban Dynamics.*

124. Bertolini and Spit (1998).

125. Euralille SPL. “Euralille SPL.” http://www.spl-euralille.fr/vivre-et-travailler-a-euralille/travailler.html (accessed October 1, 2016).

126. Bertolini and Spit (1998).

127. Ampe (2011).

128. Pol (2008).

129. Bertolini and Spit (1998).

130. Pol (2008).

131. Ampe (2011).

132. Bertolini and Spit (1998).

133. Ibid.

134. Trip (2009).

135. Eidlin (2015b).

136. SNCB Europe. “Lille Europe Train Station.” https://www.b-europe.com/Travel/Practical/Station%20information/Lille%20Europe (accessed September 20, 2016).

137. Eidlin (2015b).

138. Ibid.

139. Trip (2009).

140. Ibid, p. 84.

141. Eidlin (2015b) reporting from an interview with Philippe Menerault

142. Bertolini and Spit (1998).

143. Autocité. “Parking Lille.” http://www.autocite.fr/parking/lille/ (accessed September 20, 2016).

144. SNCB Europe.

145. SNCF. “Gares & Connexions.”

146. Trip (2008:84).

147. SNCF. “Gares & Connexions.”

148. Trip (2009, pp. 81-82).

149. Ampe (2009, p. 66).

150. Ampe (2009).

151. Interview with Phillipe Menerault in Eidlin (2015b).

152. van den Berg and Pol (1998, p. 61).

153. Interview with Phillipe Menerault in Eidlin (2015b).

154. Pol (2008).

155. Pol (2008).

156. Ampe (2009).

157. Trip (2008, p. 82).

158. Nuworsoo and Deakin (2009).

159. Eidlin (2015a).

160. Bertolini and Spit (1998, p. 70).

161. Bertolini and Spit (1998).

162. Organisation for Economic Co-Operation and Development (OECD). (2014). “Metropolitan areas: Lyon.” St Ampe (2011).ats.oecd.org.

163. Eidlin (2015a).

164. Interview with Frédéric Duchêne, Project Director for Mission Part Dieu, September 28, 2016.

165. Eidlin (2015a).

166. Tuppen, J. (1977). “Redevelopment of the City Centre: The Case of Lyon—la part Dieu,” *Scottish Geographical Magazine*, 93:3, 151-158, DOI: 10.1080/00369227708736375

167. Nuworsoo and Deakin (2009).

168. Eidlin, personal communication.

169. Ibid.

170. Collomb, G. (publication director). (2011). *Lyon Part-Dieu Notebooks: The Birth of a Project.* Published by Grand Lyon – L'Agence d'urbanisme de Lyon.

171. SNCF Gares et Connexions is a subsidiary of SNCF.

172. Eidlin (2015a, pp. 36-37).

173. Ibid.

174. La Métropole de Grand Lyon. "Lyon Part-Dieu," http://www.lyon-partdieu.com/. (accessed September 24, 2016).

175. Eidlin (2015a).

176. La Métropole de Grand Lyon.

177. Collomb (2011).

178. Eidlin (2015a).

179. Collomb (2011, p.11).

180. Ninety percent of SPL Lyon Part-Dieu is owned by the Métropole de Lyon, or Lyon Metropolis, and ten percent by the Ville de Lyon, or City of Lyon (La Métropole de Grand Lyon).

181. Interview with Frédéric Duchêne, September 28, 2016.

182. Ibid.

183. Collomb (2011).

184. Interview with with Frédéric Duchêne, September 28, 2016.

185. Bouly, M., Valentin, J.M., and Verhage, R. (2011). "La Part-Dieu, Quartier D'Affaires Et Noeud Multimodal (Part-Dieu Station: Business District and Multi-Modal Hub)." In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 68-85. Paris: Parentheses.

186. SNCF. "Votre gare: Lyon Part Dieu." https://www.gares-sncf.com/fr/gare/frlpd/lyon-part-dieu (accessed September 27, 2016).

187. Interview with with Frédéric Duchêne, September 28, 2016.

188. Eidlin, personal communication.

189. Ibid, p. 35.

190. Collomb (2011, p. 26).

191. Eidlin (2015a).

192. Collomb (2011, p. 25).

193. Interview with with Frédéric Duchêne, September 28, 2016.

194. Eidlin (2015a, p.35).

195. Eidlin, personal communication.

196. In Eidlin (2015a, 35).

197. Couturier, B., Barone, F., Challéat, F., Koch-Mathian, S., Giron, B., and Joos, M. (2014). *Grand Lyon, Part-Dieu District: Implementation Plan*. Published by Transform. http://urbantransform.eu/wp-content/uploads/sites/2/2015/07/D4.2-Lyon.pdf (accessed October 31, 2016).

198. Eidlin (2015a).

199. Eidlin (2015a); La Métropole de Grand Lyon.

200. LPA. (2016). "Tarifs Au 1er Août 2016." http://www.lpa.fr/wp-content/uploads/2016/09/LPA16_TARIFS_Web.pdf (accessed September 24, 2016).

201. SNCF, Votre gare.

202. Collomb, G. (publication director). (2012). *Lyon Part-Dieu Notebooks: Part-Dieu: Super Coproduction*. Published by Grand Lyon – L'Agence d'urbanisme de Lyon.

203. La Métropole de Grand Lyon.

204. The Lyon Saint-Exupéry Airport is also served by HSR, but travelers cannot take HSR between the airport and Gare Part-Dieu. This light-rail line is not part of Lyon's public transit system.

205. Eidlin, personal communication.

206. Eidlin (2015a, p. 40).

207. Nuworsoo and Deakin (2009).

208. Rietveld, P., F.R. Bruinsma, H.T. van Delft, and B. Ubbels. 2001. Economic impacts of high speed trains experiences in Japan and France: Expectations in the netherlands. Amsterdam: Vrije Universiteit Amsterdam.

209. Nuworsoo and Deakin (2009).

210. Rietveld et al. (2001, p. 12).

211. Gemeente Utrecht, Jaarbeurs, ProRail, Klepierre, and De Nederlandse Spoorwegen. CU2030. http://www.cu2030.nl/page/english (accessed: October 20, 2016).

212. Interview with Barend Kuenen, July 27, 2016.

213. Ibid.

214. Gemeente Utrecht.

215. Interview with Barend Kuenen, July 27, 2016.

216. Ibid.

217. Ibid.

218. Buijze, Anoeska. (2013) Case Study Utrecht Station Area, the Netherlands: How PPPs Restructured a Station, a Shopping Mall and the Law. Published by AISSR programme group Urban Planning, Amsterdam.

219. Conceição, Ana. (2015). From City's Station to Station City: An Integrative Spatial Approach to the (Re) Development of Station Areas. Master's Thesis, Technische Universiteit Delft.

220. Interview with Barend Kuenen, July 27, 2016.

221. Bouwman, H. and Bekkering, H. (2007) A Masterplan for Utrecht Railway Station Area. Published in NovaTerra Connected Cities, September 2007, 21-26.

222. Interview with Barend Kuenen, Juy 27, 2016.

223. Bouwman and Bekkering (2007, p. 23).

224. Ibid p. 24.

225. Gemeente Utrecht.

226. Buijze (2013).

227. Bouwman and Bekkering (2007).

228. Ibid, p. 21.

229. Conceição (2015, p.110).

230. Interview with Barend Kuenen, July 27, 2016.

231. Conceição (2015).

232. Interview with Barend Kuenen, July 27, 2016.

233. Conceição (2015, p. 110).

234. Ibid, p. 110.

235. Interview with Barend Kuenen, July 27, 2016.

236. Conceição 2015.

237. Interview with Barend Kuenen, July 27, 2016.

238. Mijksenaar "OV-chipcard Ticket Gates." http://www.mijksenaar.com/project/ov-chipkaart-ticket-gates/ (accessed December 22, 2016).

239. Mijksenaar "Welcome to Utrecht Centraal Station 2.0!" http://www.mijksenaar.com/new/story/welcome-to-utrecht-central-station-2-0/ (accessed December 22, 2016).

240. Interview with Barend Kuenen, July 27, 2016.

241. Ibid.

242. Ibid.

243. Conceição (2015).

244. Bouwman and Bekkering (2007, p. 25).

245. Gemeente Utrecht.

246. Conceição (2015).

247. Interview with Barend Kuenen, July 27, 2016.

248. Ibid.

249. Ibid.

250. Ibid.

251. Ibid.

252. Buijze (2013, p. 11).

253. Ibid, p. 11.

254. Pieters, J. (2015) Report: Utrecht Centraal Station Rebuild EUR53 Million Over Budget. *NLTimes.* http://nltimes.nl/2015/09/14/report-utrecht-central-station-rebuild-eu53-million-budget (accessed September 30, 2016).

255. Interview with Barend Kuenen, July 27, 2016.

256. Pol, P., Jacobs, W. and R. Veerkamp. (2011). "Rotterdam Central District." In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 104-120. Paris: Parentheses.

257. Griffiths, A. (2014) "Rotterdam Centraal Reopens with a Pointed Metal-Clad Entrance." *Dezeen Magazine*. Online at http://www.dezeen.com/2014/03/22/rotterdam-centraal-station-benthem-crouwel-mvsa-architects-west-8/

258. This section contains sections of text written by Deike Peters jointly with Laura Tolkoff of SPUR for a Blog Post on Rotterdam featured on SPUR's website in the fall of 2016. http://www.spur.org/news/2016-09-22/lessons-diridon-rebuilding-rotterdam-centraal-station (accessed November 15, 2016).

259. Bergren Miller, A. (2014) Two-Sided Railway Station by Team CS. *The Architect's Newspaper*. April 16, 2014. http://archpaper.com/2014/04/two-sided-railway-station-by-team-cs/ (accessed October 30, 2016).

260. For a series of high-quality, striking photographs of the station and the surrounding area, see http://www.dezeen.com/2014/03/22/rotterdam-centraal-station-benthem-crouwel-mvsa-architects-west-8/

261. Berkers, M. (2015). Accommodating Chaos. "The New Rotterdam Central Station." *Topos: European landscape magazine*, (91), p. 16.

262. Pol, P., Jacobs, W. and R. Veerkamp (2011) Rotterdam Central District. In Terrin, J.J., (Ed.) *Railway stations and urban dyn*amics. POPSU Europe. (pp. 104-120).

263. Trip, J. J. (2005). "Railway Station Development in Post-Industrial Rotterdam: Path Dependency and Shifting Priorities." In *45th Congress of the European Regional Science Association: Land Use and Water Management in a Sustainable Network Society* (pp. 23-27).

264. Majoor, S., & Schuiling, D. (2008). “New Key Projects for Station Redevelopment in the Netherlands.” In Bruinsma et al. (Eds.) (2008), pp. 101-123.

265. Triggianese, M. (2014). European High Speed Railway, Understanding Design Contradictions for Long-Term Urban Architecture Strategy. In *Proceedings of the international conference Urban Futures-Squaring Circles: Europe, China and the World in 2050, Lisbon (Portugal) 10-11 Oct., 2014*. Institute of Social Sciences-University of Lisbon; Institute of Studies for the Integration of Systems-Rome; The Chinese University of Hong Kong.

266. Trip (2005, p. 14).

267. The actual document is available online for PDF viewing at https://www.yumpu.com/nl/document/view/25864733/pdf-rotterdam-central-district-gemeente-rotterdam (accessed October 24, 2016).

268. Pol, Jacobs, and Veerkamp (2011).

269. The more recent document on the “Weena Global City District,” published in July 2007 by the City of Rotterdam and partners, is accessible at https://www.yumpu.com/nl/document/view/25864517/het-gebiedsconcept-voor-de-toekomst-van-het-stationskwartier-door- (accessed October 24, 2016).

270. Rotterdam Central District. “Organization.” http://www.rotterdam-centraldistrict.nl/organisation (accessed December 18, 2016).

271. Rotterdam Central District http://rotterdam-centraldistrict.dpi.nl/ (accessed December 18, 2016).

272. Tolkoff, L. and Peters, D. (2016). “Lessons for Diridon: Rebuilding Rotterdam Centraal Station.” SPUR Blog, http://www.spur.org/news/2016-09-22/lessons-diridon-rebuilding-rotterdam-centraal-station (accessed November 15, 2016).

273. Frearson. (2016). “MVRDV Completes Giant Staircase in Rotterdam City Centre. *Dezeen Magazine*.” http://www.dezeen.com/2016/05/17/mvrdv-the-stairs-giant-scaffolding-installation-groot-handelsgebouw-rotterdam/ (accessed October 30, 2016).

274. This type of temporary activation strategy has become commonplace for big infrastructure megaprojects across Europe now. It all started with the famous bright red INFOBOX that stood on Berlin’s Potsdamer Platz for over a decade after the fall of the Berlin wall. A true tourist attraction to millions, it provided amazing views and detailed information about what was being built where and why.

275. Armada Mobility. “NS Wayfinding at Rotterdam Centraal Station.” http://www.armadamobility.com/en/references/ns-bewegwijzering-rotterdam-centraal/ (accessed December 21, 2016).

276. For details, see page 310ff in: Triggianese, M. (2014) “Research and Practice: The European High Speed Rail Station. The Cyclic Design Process in Complex Interventions.” In: F. Madeo and M. A. Schnabel (Eds.), *Across: Architectural Research through to Practice*: 48th International Conference of the Architectural Science Association 2014, The Architectural Science Association & Genova University Press. (pp. 303-314).

277. Griffiths (2014).

278. RFI owns Italy’s railway network and is a subsidiary of Ferrovie dello Stato (FS), which is owned by the government of Italy.

279. Ciocchetti et al. (2011). “Torino Porta Susa et la Spina Centrale (Torino Porta Susa and the Spina Centrale).” In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 134. Paris: Parentheses.

280. Ibid, p. 16.

281. Ibid.

282. Ferrovie dello Stato Italiane SpA (FS Italiane Group). (2012). “Nuova Stazione Av Torino Porta Susa.” http://www.fsnews.it/cms-instance/documenti/fsnews/NUOVA_STAZIONE_AV_TORINO_PORTA_SUSA14012013.pdf (accessed October 30, 2016).

283. Ciocchetti et al. (2011).

284. arch daily (2014). “Porta Susa TGV Station / Silvio d’Ascia Architecture.” http://www.archdaily.com/481986/porta-susa-tgv-station-silvio-d-ascia (accessed September 5, 2015).

285. RFI (2005). “Turin Urban Junction.” http://www.rfi.it/cms-file/allegati/rfi/Turin%20urban%20junction.pdf (accessed October 25, 2016).

286. Lomholt, I. (2012). “Gare de Turin Porta Susa: Turin Railway Station.” *E-Architect.* http://www.e-architect.co.uk/italy/turin-train-station (accessed October 30, 2016).

287. arch daily (2014).

288. Ciocchetti et al. (2011).

289. arch daily (2014).

290. Ciocchetti et al. (2011).

291. RFI (2005).

292. FS Italiane Group (2012).

293. Ciocchetti et al. (2011, p. 130).

294. Ciocchetti et al. (2011).

295. Ibid.

296. Ciocchetti et al. (2011).

297. RFI (2005).

298. Ciocchetti et al. (2011).

299. RFI (2005).

300. RFI (2005).

301. Chiandoni, M. (2013). “Italian Premier Opens Rebuilt Turin Porta Susa Station.” *International Railway Journal*, January 17. http://www.railjournal.com/index.php/high-speed/italian-premier-opens-rebuilt-turin-porta-susa-station.html (accessed September 5, 2015).

302. FS Italiane Group (2012).

303. Ciocchetti et al. (2011, p.138).

304. Chiandoni (2013).

305. Lomholt (2012).

306. FS Italiane Group (2012).

307. Città di Torino. “[To]Bike.” http://www.tobike.it/ (accessed October 25, 2016).

308. RFI (2005).

309. FS Italiane Group (2012).

310. arch daily (2014).

311. Ciocchetti et al. (2011).

312. Bertolini (2008).

313. Terrin (2009, p. 24).

314. Interview with Frank Fuller, October 24, 2016.

315. This example was offered by Frank Fuller.

316. Interview with Frank Fuller, October 24, 2016.

317. Interview with Ben Tripousis, September 28, 2016.

318. Interview with Frank Fuller, October 24, 2016.

319. Shoup, D, (1995). "An Opportunity to Reduce Minimum Parking Requirements." *Journal of the American Planning Association*, 61(1), pp. 14–28.

320. According to Ben Tripousis, an underground solution seemed to be highly unlikely at the time of this writing.

321. Loukaitou-Sideris, A. Higgins, H., Cuff, D., and Oprea, D. (2103). "Up in the Air: Urban Design for Light Rail Transit Stations in Highway Medians." *Journal of Urban Design,* 18(3), pp. 313-339.

322. Interview with Frank Fuller, October 24, 2016.

323. The English language version of the comprehensive 109-page Zuidas 2009 Vision Document approved by the Amsterdam City Council can be accessed at City of Amsterdam (2009) webpage: https://www.amsterdam.nl/zuidas/english/documents/documenten-basis/basis-documenten/zuidas-vision/ (accessed October 30, 2016).

324. See, for example http://www.theguardian.com/travel/2015/dec/07/arnhem-netherlands-new-railway-station

325. For German coverage, see the city of Ausburg website: http://www.projekt-augsburg-city.de/hauptbahnhof/die-vision/ and http://www.augsburger-allgemeine.de/augsburg/Dobrindt-gibt-offiziellen-Startschuss-fuer-den-Bahnhofsumbau-id34758832.html (accessed October 20, 2016).

326. See, for example, http://www.barcelonasagrera.com/ and pp. 32-51. (pp. 32-51).

327. Loukaitou-Sideris, A., Peters, D., and Wei, W. (2015). *Promoting Intermodal Connectivity at California's High-Speed Rail Stations*. San Jose: Mineta Transportation Institute.

328. Eidlin, E. (2015a). *Making the Most of High Speed Rail in California: Lessons from France and Germany.* The German Marshall Fund of the United States.

329. Loukaitou-Sideris et al. (2015), p. 105.

330. See http://www.theguardian.com/artanddesign/2009/sep/16/liege-guillemins-train-station

331. Loukaitou-Sideris et al. (2015), p. 128.

BIBLIOGRAPHY

arch daily. (2014). “Porta Susa TGV Station / Silvio d’Ascia Architecture.” http://www.archdaily.com/481986/porta-susa-tgv-station-silvio-d-ascia. (accessed September 5, 2015).

arch daily. (January 19, 2015). “Rotterdam Central Station / Benthem Crouwel Architects + MVSA Architects + West 8,” http://www.archdaily.com/588218/rotterdam-central-station-benthem-crouwel-architects-mvsa-meyer-en-van-schooten-architecten-and-west-8 (accessed November 6, 2016).

Ampe, Francis. (2011). “Lille: Gare D’Euralille (Lille: Euralille Station).” In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 52-67. Paris: Parentheses.

Autocité. “Parking Lille.” http://www.autocite.fr/parking/lille/ (accessed September 20, 2016).

Barcelona Sagrera website: http://www.barcelonasagrera.com/licitacions-perfil/ (accessed November 6, 2016).

Bellet, C. (2014). *The Introduction of the High Speed Rail and Urban Restructuring: The Case of Spain* (Lleida, Spain: University of Lleida). http://www.researchgate.net/publication/237543696_ (accessed November 5, 2016).

Berkers, M. (2015). “Accommodating Chaos. The New Rotterdam Central Station.” *Topos: European Landscape Magazine*, (91), p. 16.

Bergren Miller, A. (2014) Two-Sided Railway Station by Team CS. The Architect’s Newspaper. April 16, 2014. Online at http://archpaper.com/2014/04/two-sided-railway-station-by-team-cs/ (accessed October 30, 2016).

Bertolini, L. (2008). “Station Areas as Nodes and Places in Urban Networks: An Analytical Tool and Alternative Development Strategies.” In F. Bruinsma, E. Pels, H. Priemus, P. Rietveld, & B. van Wee (Eds.), *Railway Development* (pp. 35–57). Leipzig, Germany: Springer-Verlag.

Bertolini, L. and Spit, T. (1998). *Cities on Rails: The Redevelopment of Railway Station Areas*. New York: E&FN Spon.

Bertolini, L., Carrey, C., and Renne, J. (2012). “Station Area Projects in Europe and Beyond: Towards Transit Oriented Development?” *Built Environment.* 38(1): 31-50.

BMS Design Group + Kimley Horn Associates. (April 2010). *The Alameda. San Jose: prepared for the San Jose Redevelopment Agency and Caltrans. http://www.sjredevelopment.org/TheAlamedaTransportationImprovements/TheAlamedaPlan.pdf* (accessed October 30, 2016).

Bouly, M., Valentin, J.M., and Verhage, R. (2011). “La Part-Dieu, Quartier D’Affaires Et Noeud Multimodal (Part-Dieu Station: Business District and Multi-Modal Hub).” In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 68-85. Paris: Parentheses.

Bouwman, H. and Bekkering, H. (2007) A Masterplan for Utrecht Railway Station Area. Published in NovaTerra Connected Cities, September 21-26, 2007.

Bruinsma, F., Pels, E., Priemus, H., Rietveld, P and van Wee, B. (2008). *Railway Development: Impacts on Urban Dynamics.* Heidelberg: Physical Verlag.

Buhigas, M. (2011). “Barcelone-La Sagera (Barcelona and Sagrera Station).” In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 32-51. Paris: Parentheses.

Buijze, A. (2013) Case Study Utrecht Station Area, the Netherlands: How PPPs Restructured a Station, a Shopping Mall and the Law. Published by AISSR programme group Urban Planning, Amsterdam.

California High-Speed Rail Authority website. *San Francisco to San Jose Project Section. https://www.hsr.ca.gov/docs/programs/statewide_rail/proj_sections/SanFran_SanJose/LPMG_July2016_Packet.pdf* (accessed October 15, 2016).

Cascetta, E. and Pagliara, F. (2008). “Integrated Railways-Based Policies: The Regional Metro System Project of Naples and Campagnia.” *Transport Policy.* 15: 81-93.

Cascetta, E., Papola, A., Pagliara, F., and Marzano, V. (2011). “Analysis of the Mobility Impacts of the High-Speed Rome-Naples Rail using Within Dynamic Mode Service Choice Models.” *Journal of Transport Geography.* 19: 635-643.

Cervero, R., & Bernick, M. (1996). *High-Speed Rail and Development of California’s Central Valley: Comparative Lessons and Public Policy Considerations.* Working paper, Institute of Urban and Regional Development. Berkeley: University of California.

Chang. J., Ni, J. and Lai, R. (2012) “High-Speed Rail in Asia: The Taiwan Experience.” Paper presented at the UC Berkeley Center for Environmental Public Policy Int’l Expert Symposium on High-Speed Rail and Sustainability, Berkeley, CA, November 29, 2012.

Chiandoni, M. (2013). “Italian Premier Opens Rebuilt Turin Porta Susa Station.” *International Railway Journal*, January 17. http://www.railjournal.com/index.php/high-speed/italian-premier-opens-rebuilt-turin-porta-susa-station.html (accessed September 5, 2015).

Ciocchetti et al. (2011). “Torino Porta Susa et la Spina Centrale (Torino Porta Susa and the Spina Centrale).” In *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues),* edited by Jean-Jacques Terrin, 124-141. Paris: Parentheses.

City of Amsterdam (September 2009). *Zuidas Vision Document.* https://www.amsterdam.nl/zuidas/english/documents/documenten-basis/basis-documenten/zuidas-vision/ (accessed November 6, 2016).

City of Aussburg, n.d. “Mitten in der Stadt, Mitten in den Hertzen.” http://www.projekt-augsburg-city.de/hauptbahnhof/die-vision/ and http://www.augsburger-allgemeine.de/augsburg/Dobrindt-gibt-offiziellen-Startschuss-fuer-den-Bahnhofsumbau-id34758832.html (accessed November 6, 2016).

Città di Torino. “[To]Bike.” http://www.tobike.it/ (accessed October 25, 2016).

Collomb, G. (publication director). (2011). *Lyon Part-Dieu Notebooks: The Birth of a Project.* Published by Grand Lyon – L’Agence d’urbanisme de Lyon.

Collomb, G. (publication director). (2012). *Lyon Part-Dieu Notebooks: Part-Dieu: Super Coproduction*. Published by Grand Lyon – L’Agence d’urbanisme de Lyon.

Conceição, Ana. (2015). From City’s Station to Station City: An Integrative Spatial Approach to the (Re) Development of Station Areas. Master’s Thesis, Technische Universiteit Delft.

Couturier, B., Barone, F., Challéat, F., Koch-Mathian, S., Giron, B., and Joos, M. (2014). *Grand Lyon, Part-Dieu District: Implementation Plan*. Published by Transform. http://urbantransform.eu/wp-content/uploads/sites/2/2015/07/D4.2-Lyon.pdf (accessed October 31, 2016).

CU2030a (n.d.) “Reasons to Build.” http://cu2030.nl/page/masterplan (accessed November 6, 2016).

CU2030b (n.d.) “Utrecht Central - Public Transport Terminal.” http://www.cu2030.nl/page/en-ov-terminal (accessed November 6, 2016).

De Jong, M. (2007). Attractiveness of HST Locations: Eight Cases in Northwest Europe” master thesis, University of Amsterdam.

Dovey, K. (1998). “Multiplicities and Complicities: Signifying the future at Euralille.” *Urban Design International*, 3, 89-99.

Diridon Station Area Plan: 10-Year Horizon Analysis (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33059 (accessed October 30, 2016).

Diridon Station Area Plan: Alternatives Analysis Report. (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/1614 (accessed October 30, 2016).

Diridon Station Area Plan: Existing Conditions Report. (2010). San Jose. http://www.sanjoseca.gov/DocumentCenter/View/1629 (accessed October 30, 2016).

Diridon Station Area Plan. Final Plan Report. (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33057 (accessed October 30, 2016).

Diridon Station Area Plan: Implementation Strategy Report (June 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/33058 (accessed October 30, 2016).

Diridon Station Area Plan: Integrated Final Program Environmental Impact Report (August 2014). Prepared for the City of San Jose. http://www.sanjoseca.gov/DocumentCenter/View/34120 (accessed October 30, 2016).

Eidlin, E. (2015a). *Making the Most of High Speed Rail in California: Lessons from France and Germany.* The German Marshall Fund of the United States. http://www.gmfus.org/publications/making-most-high-speed-rail-california (accessed December 20, 2016).

Eidlin, E. (2015b). “On High-Speed Rail, City Building, and a Visionary French Mayor: The Case of Lille.” The German Marshall Fund of the United States. http://www.gmfus.org/blog/2015/03/30/high-speed-rail-city-building-and-visionary-french-mayor-case-lille (accessed October 28, 2016).

Eidlin, E. Part Dieu’s Faults and Other First Impressions from Lyon. The German Marshall Fund of the United States.http://www.gmfus.org/blog/2013/10/22/part-dieu%E2%80%99s-faults-and-other-first-impressions-lyon (accessed September 24, 2016).

Euralille SPL. “Euralille SPL.” http://www.spl-euralille.fr/vivre-et-travailler-a-euralille/travailler.html (accessed October 1, 2016).

Ferrovie dello Stato Italiane SpA (FS Italiane Group). (2012). “Nuova Stazione Av Torino Porta Susa.” http://www.fsnews.it/cms-instance/documenti/fsnews/NUOVA_STAZIONE_AV_TORINO_PORTA_SUSA14012013.pdf. (accessed October 30, 2016).

Flyvbjerg , B., Bruzelius, N., and Rothengatter, W. (2003). *Megaprojects and Risk: An Anatomy of Ambition.* Cambridge: Cambridge University Press.

Frearson, A. (2016) “MVRDV Completes Giant Staircase in Rotterdam City Centre. *Dezeen Magazine*.” http://www.dezeen.com/2016/05/17/mvrdv-the-stairs-giant-scaffolding-installation-groot-handelsgebouw-rotterdam/ (accessed November 6, 2016).

Gemeente Utrecht, Jaarbeurs, ProRail, Klepierre, and De Nederlandse Spoorwegen. CU2030. http://www.cu2030.nl/page/english (accessed: October 20, 2016).

Griffiths, A. (2014). Rotterdam Centraal Reopens with a Pointed Metal-Clad Entrance. *Dezeen Magazine*. http://www.dezeen.com/2014/03/22/rotterdam-centraal-station-benthem-crouwel-mvsa-architects-west-8/ (accessed November 6, 2016).

Institut national de la statistique et des études économiques (INSEE). 2013. 59350-Lille. http://www.insee.fr/fr/ppp/bases-de-donnees/recensement/populations-legales/commune.asp?annee=2013&depcom=59350 (accessed September 20, 2016).

Kloosterman, R., & Trip, J. (2006, July 6–8). "Planning for Quality? Assessing the Role of Quality of Place in Developing High-Speed Railway Stations." Paper presented at International Conference on Urban Conditions and Life, Amsterdam.

Kloosterman, R. and Trip, J. (2011). "Planning for Quality? Assessing the Role of Quality of Place in Current Dutch Planning Practice." *Journal of Urban Design.* 16(4): 455-470.

Kuenen, Barend. (2016) Interview and in person station tour of Utrecht Centraal with Deike Peters, July 27, 2016.

La Métropole de Grand Lyon. "Lyon Part-Dieu." http://www.lyon-partdieu.com/ (accessed September 24, 2016).

Lille Office de Tourisme et des Congress. (2016). Lille 2016 Press Kit. http://dk.media.france.fr/sites/default/files/document/press_kit/DP%20Lille%20gb-2016-787.pdf (accessed September 15, 2016).

Lomholt, I. (2012). "Gare de Turin Porta Susa: Turin Railway Station." *E-Architect.* http://www.e-architect.co.uk/italy/turin-train-station (accessed October 30, 2016).

Loukaitou-Sideris, A., Cuff, D., Higgins, T., and Linovski, O. (2012a). "Impact of High Speed Rail Stations on Local Development: A Delphi Survey." *Built Environment* 38(1): 51-70.

Loukaitou-Sideris, A., Cuff, D., Higgins, T., and Wenbin Wei. (2012b). *Planning for Complementarity: An Examination of the Role and Opportunities of First-Tier and Second-Tier Cities along the High Speed Rail Network in California.* San Jose: Mineta Transportation Institute.

Loukaitou-Sideris, A., Cuff, D., Higgins, H. (2013). *HSR Development: Planning for High Speed Rail in Southern California Communities.* Los Angeles: UCLA Lewis Center and CityLab.

Loukaitou-Sideris, A, Higgins, H, Piven, M. and Wei, W. (2013). "Tracks to Change or Mixed Signals? A Review of the Anglo-Saxon Literature on the Economic and Spatial Impacts of High-Speed Rail, *Transport Reviews.* 33 (6): 617-633.

Loukaitou-Sideris, A. (2013). “New Rail Hubs along the High-Speed Rail Corridor in California: The Urban Design Challenges.” *Transportation Research Record,* 2350-01: 1-8.

Loukaitou-Sideris, A., Peters, D., and Wei, W. (2015). *Promoting Intermodal Connectivity at California’s High-Speed Rail Stations*. San Jose: Mineta Transportation Institute.

Loukaitou-Sideris, A. Higgins, H., Cuff, D., and Oprea, D. (2103). “Up in the Air: Urban Design for Light Rail Transit Stations in Highway Medians.” *Journal of Urban Design,* 18(3), pp. 313-339.

LPA. (2016). “Tarifs Au 1er Août 2016.” http://www.lpa.fr/wp-content/uploads/2016/09/LPA16_TARIFS_Web.pdf (accessed September 24, 2016).

Majoor, S., and Schuiling, D. (2008). “New Key Projects for Station Redevelopment in the Netherlands.” In Bruinsma, et al. (Eds.) *Railway Development: Impacts on Urban Dynamics Railway Development* (pp. 101-123). Physica-Verlag HD.

Murakami, J. and Cervero, R. (2010, December 2–3). *California high-speed rail and economic development: Station-area market profiles and public policy responses*. Paper presented at a symposium, University of California, Berkeley Faculty Club.

Novy, J., and Peters, D. (2012). Railway Station Mega-Projects as Public Controversies: The Case of Stuttgart 21. *Built Environment*, 38(1), 128-145.

Nuworsoo, C. and Deakin, E. (2009, January 11–15). “Transforming High-Speed Rail Stations to Major Activity Hubs: Lessons for California.” Paper presented at meeting of the Transportation Research Board, Washington, DC.

Office for Metropolitan Architecture. “Euralille.” http://oma.eu/projects/euralille (accessed October 1, 2016).

Organisation for Economic Co-Operation and Development (OECD). 2014. “Metropolitan Areas: Lille.” Accessed October 1, 2016. Stats.oecd.org.

Organisation for Economic Co-Operation and Development (OECD). (2014). “Metropolitan Areas: Lyon.” Stats.oecd.org.

Organisation for Economic Co-Operation and Development (OECD). 2014. “Metropolitan Areas: Turin.” Stats.oecd.org.

Peters, D. (2009). The Renaissance of Inner-City Rail Station Areas: A Key Element in Contemporary Urban Restructuring Dynamics. *Critical Planning*, 16, 163-185.

Peters, D., & Novy, J. (2012). Train Station Area Development Mega-Projects in Europe: Towards a Typology. *Built Environment*, 38(1), 12-30.

Pieters, J. (2015) Report: Utrecht Centraal Station Rebuild EUR53 Million Over Budget. *NLTimes.* http://nltimes.nl/2015/09/14/report-utrecht-central-station-rebuild-eu53-million-budget (accessed September 15, 2016).

Pol, P. (2002). *A Renaissance of Stations, Railways, and Cities: Economic Effects, Development Strategies, and Organizational Issues of European High-Speed Train Stations.* Delft: Delft University Press.

Pol, P. (2008). "HST Stations and Urban Dynamics: Experiences from Four European Cities." In Bruisma et al. (eds.) *Railway Development: Impacts on Urban Dynamics.* Leipzig, Germany: Springer-Verlag.

Pol, P., Jacobs, W. and R. Veerkamp. (2011) Rotterdam Central District. In Terrin, J.J., (Ed.) *Railway stations and urban dyn*amics. POPSU Europe. (pp. 104-120).

POPSU (La Plate-forme d'Observation des Projets de Stratégies Urbaines). "Gares et dynamiques urbaines, les enjeux de la grande vitesse." http://www.popsu.archi.fr/popsu-europe/turin/gares-tgv-et-dynamiques-de-renouvellement-urbain (accessed September 5, 2015).

Railplus. "Eurostar FAQs." https://www.railplus.com.au/eurostar/faqs.htm (accessed September 20, 2016).

Rete Ferroviaria Italiana (RFI). "Stazioni AV, nuovi luoghi per le città." http://www.rfi.it/rfi/LINEE-STAZIONI-TERRITORIO/Le-stazioni/Stazioni-per-l'alta-velocit%C3%A0/Le-stazioni-per-l'Alta-Velocit%C3%A0#1 (accessed September 5, 2015).

RFI. (2005). "Turin Urban Junction." http://www.rfi.it/cms-file/allegati/rfi/Turin%20urban%20junction.pdf (accessed October 25, 2016).

Rietveld, P., F.R. Bruinsma, H.T. van Delft, and B. Ubbels. (2001). Economic Impacts of High Speed Trains Experiences in Japan and France: Expectations in the Netherlands. Amsterdam: Vrije Universiteit Amsterdam.

Sanchez-Borras, M., Robusté, F. and O. Criado, (2011). "High-Speed Railways in Spain." *Transportation Research Record*, 2261, 1–17 <doi:10.3141/2261-05>

Shoup, D. (1995). "An Opportunity to Reduce Minimum Parking Requirements," *Journal of the American Planning Association*, 61(1), pp. 14-28.

"Smart Sustainable Districts-Utrecht the New Centre." (n.d.) http://ssd-utrecht.nl/deep-dive-utrecht/ (accessed November 6, 2016).

SNCB Europe. "Lille Europe train Station." https://www.b-europe.com/Travel/Practical/Station%20information/Lille%20Europe (accessed September 20, 2016).

SNCF. “Gares & Connexions.” https://www.gares-sncf.com/fr (accessed September 20, 2016).

SNCF Open Data. (2016). “Fréquentation en gares en 2014.” https://ressources.data.sncf.com/explore/dataset/frequentation-gares/table/?q=Lille+Europe&sort=-volume_total_d_usagers_2014_voyageurs_non_voyageurs (accessed September 18, 2016).

SNCF. “TER Rhone-Alpes.” http://www.ter.sncf.com/rhone-alpes/gares/carte-oura. (accessed September 27, 2016).

SNCF. “Train Stations: Turin.” https://uk.voyages-sncf.com/en/destination/italy/turin/train-station (accessed October 25, 2016).

SNCF. “Votre gare: Lyon Part Dieu.” https://www.gares-sncf.com/fr/gare/frlpd/lyon-part-dieu (accessed September 27, 2016).

SPUR. (2011). *Beyond the tracks: The Potential of High-Speed Rail to Reshape California’s Growth.* San Francisco: SPUR Report, January 2011, https://www.spur.org/sites/default/files/publications_pdfs/SPUR_Beyond_the_Tracks.pdf (accessed June 13, 2016).

SPUR. (March 2014). *The Future of Downtown San Jose.* http://www.spur.org/publications/spur-report/2014-03-17/future-downtown-san-jose (accessed October 30, 2016).

Tapiador, F.J., Burckhart, K. and Marti-Henneberg, M. (2009). “Characterizing European High-Speed Train Status Using Intermodal Time and Entropy Metrics.” *Transportation Research Part A.* 43: 197-208.

Terrin, J.J. (2011). *Gares et Dynamiques Urbanes: Les Enjeux de la Grande Vitesse (Railway Stations and Urban Dynamics: High-Speed Issues).* Paris: Parentheses.

The Guardian. (December 7, 2015). “Arnhem’s Stunning New Railway Station Raises City’s Profile.” http://www.theguardian.com/travel/2015/dec/07/arnhem-netherlands-new-railway-station (accessed November 6, 2016).

The Guardian. (September 16, 2009). “Liège-Guillemins Train Station: A Ticket to Tomorrow.” http://www.theguardian.com/artanddesign/2009/sep/16/liege-guillemins-train-station (accessed November 6, 2016).

Tolkoff, L. and Peters, D. (2016) “Lessons for Diridon: Rebuilding Rotterdam Centraal Station.” SPUR Blog, http://www.spur.org/news/2016-09-22/lessons-diridon-rebuilding-rotterdam-centraal-station (accessed October 30, 2016).

Transpole. “V’lille.” http://www.vlille.fr/stations/les-stations-vlille.aspx (accessed September 18, 2016).

Triggianese, M. (2014). “European High Speed Railway, Understanding Design Contradictions for Long-Term Urban Architecture Strategy.” In Proceedings of the international conference Urban Futures-Squaring Circles: Europe, China and the World in 2050, Lisbon (Portugal) 10-11 Oct., 2014.

Triggianese, M. (2014) “Research and Practice: The European High Speed Rail Station. The Cyclic Design Process in Complex Interventions.” In: Madeo, F. and Schnabel, M.A. (eds.), Across: *Architectural Research through to Practice: 48th International Conference of the Architectural Science Association 2014*, The Architectural Science Association & Genova University Press. (pp. 303-314).

Trip, J. J. (2005). “Railway Station Development in Post-Industrial Rotterdam: Path Dependency and Shifting Priorities.” In *45th Congress of the European Regional Science Association: Land Use and Water Management in a Sustainable Network Society* (pp. 23-27).

Trip, J.J. (2008). “What Makes a City: Urban Quality in Euralille, Amsterdam South Axis and Rotterdam Central.” In F. Bruinsma, E. Pels, H. Priemus, P. Rietveld, & B. van Wee (Eds.), *Railway development: Impacts on Urban Dynamics* (pp. 79–99). Leipzig, Germany: Springer-Verlag.

Tuppen, J. (1977). “Redevelopment of the City Centre: The Case of Lyon—la part Dieu.” *Scottish Geographical Magazine*, 93:3, 151-158, DOI: 10.1080/00369227708736375

Turin Italy Guide. Turin Travel Info. http://www.turinitalyguide.com/travel-information/ (accessed September 5, 2015).

Urban Land Institute. (September 2010). California High Speed Rail TOD Market Place. http://sf.uli.org/wp-content/uploads/sites/47/2011/05/HSR-TOD-TAPs-Final-Report.pdf (accessed October 30, 2016).

Urena, J., Benegas, M., and Mohino, I. (2012) “Socioeconomic, Territorial and Sustainability Lessons from Developing High-Speed Rail in Spain.” Paper presented at the UC Berkeley Center for Environmental Public Policy Int’l Expert Symposium on High-Speed Rail and Sustainability, Berkeley, CA, November 29, 2012.

Van den Berg, L. and Pol, P. (1998). *The European High-Speed Train Network and Urban Development: Experiences in Fourteen European Urban Regions.* Aldershot: Ashgate.

Willigers, J. and van Wee, B. (2011). High-Speed Rail and Office Location Choices. A Stated Choice Experiment for the Netherlands. *Journal of Transport Geography*, 19, 745-754.

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