University Transportation Research Center - Region 2

Final Report

Financing Rail Capital Projects: Historical Lessons; Contemporary Cases

Performing Organization: John Jay College of Criminial Justice/CUNY

November 2012

Sponsor:
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University Transportation Research Center - Region 2

The Region 2 University Transportation Research Center (UTRC) is one of ten original University Transportation Centers established in 1987 by the U.S. Congress. These Centers were established with the recognition that transportation plays a key role in the nation's economy and the quality of life of its citizens. University faculty members provide a critical link in resolving our national and regional transportation problems while training the professionals who address our transportation systems and their customers on a daily basis.

The UTRC was established in order to support research, education and the transfer of technology in the field of transportation. The theme of the Center is "Planning and Managing Regional Transportation Systems in a Changing World." Presently, under the direction of Dr. Camille Kamga, the UTRC represents USDOT Region II, including New York, New Jersey, Puerto Rico and the U.S. Virgin Islands. Functioning as a consortium of twelve major Universities throughout the region, UTRC is located at the CUNY Institute for Transportation Systems at The City College of New York, the lead institution of the consortium. The Center, through its consortium, an Agency-Industry Council and its Director and Staff, supports research, education, and technology transfer under its theme. UTRC's three main goals are:

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16. Abstract

Two large questions informed the research for this article: first, how and why did the mid-20th century shift from private to public ownership, financing and operation of passenger railways affect the subsequent financing and development of high speed rail? Second, does high speed rail create opportunities for the return of the private sector to a significant role in passenger rail transport, such as financing and operating new lines? To answer these questions, we adopted a historical, cross-national approach, which is relatively unusual in the field of public policy. While a number of articles have been written about general lessons that can be learned from foreign experience with high speed rail, our approach analyzes the specific reasons why the U.S. has lagged behind other countries. France was selected as a comparison case because, first, its history of moving from private to public provision of passenger rail services closely paralleled American rail history up to the Great Depression; and, second, because the divergence between the two countries at the end of the Great Depression provides powerful evidence for analyzing the causes of the decline of U.S. passenger railways in the post-World War 2 period. Scholars can build upon our work by carrying out other cross-national and historical comparisons that further elucidate the reasons why high speed rail has succeeded so well in other parts of the world, but not in the U.S.

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FINANCING HIGH SPEED RAIL IN THE UNITED STATES AND FRANCE: THE EVOLUTION OF PUBLIC-PRIVATE PARTNERSHIPS

INTRODUCTION

On October 1, 1964, the world's first dedicated high speed passenger train service, called the *Shinkansen*, began operating between Tokyo and Kyoto. The line immediately attracted a large ridership and, by the end of its third year of operations, was earning net profits over and above both its operating costs and the debt incurred for infrastructure construction and purchase of rolling stock (Gourvish, 2009: 9). This was a highly significant achievement since, starting in the 1920s, most privately operated intercity passenger rail services had become unprofitable due to competition from highway-based transportation, causing governments throughout the world, including Japan's, to nationalize passenger services. High speed rail created the possibility that these services could return to profitability; become a significant part of the national transportation systems; and perhaps even attract the private sector to return once again to operating passenger trains.

The commonly accepted definition of "very high speed" trains are those that run at average speeds greater than 150 miles per hour and operate on dedicated, grade separated track. In the more than four decades after Japan achieved high speed commercial operations, public railway companies have developed high speed lines in many Asian countries, much of western Europe and Great Britain. In the United States, a joint public-private venture between the federal government and the Pennsylvania Railroad developed *Metroliners*, trains with the potential for very high speed, in the mid-1960s. In order to understand how these countries financed their high speed networks and how and why privatization of passenger rail is now a relevant policy option, three questions must be answered: first, how and why did passenger rail services shift from private to public ownership and operation in the mid-20th century? Second, how did that change affect the development of high speed rail? Third, does high speed rail create opportunities for a return of the private sector to passenger rail transport? To answer these questions, we compare France and the United States, since that comparison reveals much about how the public and private sectors related to each other in financing railway development. Throughout most of the 19th century and early 20th centuries, privately owned passenger railways operated profitably in both countries. But, their situation changed in the 1920s and 1930s due to financial problems

caused by competition from highway-based transport which were severely exacerbated during the Great Depression. France then diverged from the U.S. by nationalizing its passenger railways and by using government financing and regulation to strengthen their competitive position. This established favorable conditions for the future development of French high speed trains. Though faced with the same Depression-induced financial crisis, the U.S. chose not to nationalize its railways. Instead, private companies were allowed to continue to operate passenger services, competing in the free market with other modes of transport. Ultimately their efforts failed and they were nationalized in 1971. Public takeover rescued American passenger railways, but left them severely weakened. This is one of the major reasons why the U.S. lagged so far behind France in developing high speed trains.

The French-U.S. comparison also elucidates many of the key issues involved with public and private financing of high speed rail, such as privatization. High speed rail lines are very expensive to build. After the French government committed to developing high speed trains in the 1970s, decades of capital investment resulted in the accrual of a large amount of railway debt. As a result, the French state took steps to draw the private sector into helping to construct and operate new lines in order to mitigate the large and increasing deficits that accompanied the first 30 years of high speed rail construction. Recent plans for a high speed line between Tours and Bordeaux involve a public-private partnership never previously attempted on French railways. At the same time, in the U.S., the State of California recently committed significant funding to constructing a high speed line between San Francisco and Los Angeles – the first high speed rail line to get this close to actual construction in the U.S. For financing, California is relying largely on public debt and has only preliminary plans for attracting private participation. Comparisons to the French high speed rail history suggest that California's approach may be viable only if the state is willing, as was France for the first 30 years of its high speed rail construction program, to assume most of the construction debt burden in both the short and long term. Thus, French rail history is directly useful in foreseeing consequences of different approaches to financing high speed trains.

In sum, cross national comparisons reveal that California will require both a high level of public borrowing as well as public guarantees on private borrowing if it is going to attract the private sector into either construction and/or operation of high speed railways. Even after the shift from privately owned and operated passenger railways to public systems in both France and the U.S., history suggests that public funding is the sine qua non of financing passenger railroads, including high speed trains.

INSTITUTIONAL FRAMEWORKS

From their beginnings in the 19th century, the U.S. and France have approached railway development differently, in large part due to institutional differences in the laws, regulations and norms that affected their financing. At the broadest level, the institutional structure of the United States has always involved a free competitive market within which private planning was dominant and public regulation of lesser importance. American laws allowed newly incorporated rail companies to act with relative autonomy and granted them the crucial legal protection of limited liability. Private railroads and their supporters in banking and real estate determined where rail lines would be constructed and which cities and regions would be served, with only minimal government intervention in this development process. The main way the government affected railway development was not through direct intervention, but by providing free grants of land on which rail lines could be constructed.

As in the United States, the central government in France granted land to railway promoters on which they built their lines. By the mid-19th century the French rail system was dominated by six major private companies that made up the so-called *Grand Réseau* ("Great Network"): a system which persisted, with some small modifications, until the late 1930s. However, those private companies were not entirely independent, since they operated under long term leases to the government on publicly owned rights of way, with strict government regulation. In return for their franchise, companies were protected by laws that prohibited any parallel and competing rail lines. This was in sharp contrast to the U.S., where railways owned their rights of way and where competition between companies was carried out within a laissez-faire market context that resulted in parallel and redundant rail lines being built throughout the country (Dobbin, 2001; Cohen, 2009).

Other institutional differences between France and the U.S. also affected railway development. The U.S. evolved a federalist system of political power which gave states and localities much greater control over decisions about where to locate new development. While the interstate commerce clause of the U.S. Constitution gives the federal government regulatory control of transportation projects that cross state lines, most intercity rail lines were built within state boundaries and their development was controlled by

state legislatures. In addition, because zoning decisions in the U.S. have always been locally controlled, cities and towns determined whether a rail line would be built in their area. Similar forms of regional or local control were not the case in France, where the national government controlled economic development decisions more directly.

In short, rail development in the U.S took place within a free market framework whereas, in France, the state intervened directly in structuring and regulating transportation. In addition, state and local control of development was and remains more influential in the U.S., because of its federalist political system, than in France, where the central government was more directly involved in controlling the form that railway development would take and in establishing direct control over the private rail corporations that developed new lines.

FRENCH – U.S. DIVERGENCE IN THE MID-20TH CENTURY

From the mid-19th until the early 20th centuries railways dominated the American and French transportation systems. Then, starting in the 1920's, the passenger rail industry in both countries began to encounter significant problems, partly due to the rapid expansion of highway-based modes of transport and partly for other reasons unique to each country. When the Great Depression occurred, railway finances deteriorated precipitously, placing the industry in both countries on the verge of systemic bankruptcy. In response, the French government nationalized its railways in 1937. The private companies that previously formed the Grand Network were merged them into a new entity, the French National Railway Company (Société Nationale des Chemins de Fer, or S.N.C.F.). However, this was not a total public takeover. The private companies were ceded 49% of SNCF stock in return for turning over their physical plant and rolling stock to the government. The state took majority control, with 51% stock ownership, and guaranteed the existing rail bonds. The government also passed legislation to regulate the entire national transportation system, including highways and airlines, to assure that passenger rail was not driven out of business by those other modes (Cohen, 2009: 28-29). In short, SNCF became a

public-private partnership, albeit one in which the power relationships between the two sectors changed, giving the government majority control of the arrangement and majority power.

With its more free market orientation, the American government did not take such a radical step. Instead, President Franklin Roosevelt used special financial powers granted him by Congress to socialize much of the railway industry's devalued debt, which rescued the industry from widespread insolvency. But, Roosevelt did not use his considerable executive powers to solve the main problem facing railroads, the overbuilding of lines. From their inception, railroad corporations had built lines that duplicated and ran parallel to competing companies in order to drive them out of business. For example, in the New York-Chicago and Dallas-Houston markets, two or more railways ran trains on tracks paralleling their competitors. Overbuilding contributed to excessive debt as rail corporations borrowed heavily to finance their construction and related development projects. Nor did Roosevelt impose regulations that would make railways more competitive with highway based transportation. In general government policy was to not disturb the marketplace, leaving railroads to compete as best they could within other modes of transport (Cohen, 2010: 25-27).

The different approaches taken by France and the U.S. to the Great Depression had some immediate and important short term results. Because federal takeover of their debt had improved their finances, U.S. railroads were able to take initiatives to improve their competitiveness with highway-based transportation. They invested new capital in infrastructure improvements and a redesigned passenger car fleet. The latter, a major change, involved the introduction of modernized trains called "streamliners," which were built from lightweight, usually stainless steel cars and pulled by either more powerful steam engines or new technology diesel locomotives. Streamliners ran at significantly faster speeds than earlier train sets (Martin, 1992: 127). In California, for example, the Southern Pacific Railway inaugurated the *Daylight* streamliner on its coastal line between San Francisco and Los Angeles, in 1937, and sharply reduced travel time from over 13 hours to under 10 hours (Hofsommer, 1986: 136). Streamliners attracted many new passengers, which improved the operating finances of railways.

On the eve of World War II, streamliners held out the prospect that this new, higher level of speed – the high speed rail of that historical moment – might give railways an opportunity to compete effectively with highway-based transport.

In France, meanwhile, the new national railway company, SNCF, which was legislated into existence in late 1937, did not become fully operational as a public entity until just before the outbreak of World War II. The war was disastrous to France's passenger rail infrastructure and rolling stock, most of which was destroyed by bombing. Thus, France's publicly operated railway network emerged from World War II in ruins and, in the early post-war period, was largely dependent on lend-lease transfers of locomotives and rolling stock from the United States to resume operations. But, because the railways had been nationalized, their pre-war debt was eliminated and the government was prepared to provide strong financial support for post-war reconstruction and renewal. In short, the war was devastating in the short term, but pre-war nationalization created the foundations for post-war renewal.

In its own way the war also helped American railways. While the entire industry was close to bankruptcy in the Great Depression, after the U.S. joined the war, they were crucial to the war effort because of being better equipped than cars or buses to transport large numbers of military personnel. The result was a huge increase in passenger (and freight) revenues which improved their finances dramatically. At the end of the war, U.S. railways were thus able to go back to the banks and other large institutional investors that had fled from the industry in the Great Depression and to get loans and credits needed to purchase new rolling stock and upgrade infrastructure, thereby to try to compete with highway based transportation. Thus American railways emerged from the war with a stronger financial foundation than during the 1930's. Similarly, while the physical plant and equipment of French railways was in ruins at the end of the war, the new national railway company, SNCF, could count on strong government support to pay back their pre-war debt and provide new capital for renewal of their infrastructure and rolling stock. Thus, railroads in both countries, each for their own reasons, were well situated to move forward in the post-war period.

POST WAR DIVERGENCE: PRIVATE SECTOR FAILURES, PUBLIC SUCCESSES

In the 10 years after the war ended railways in the U.S. purchased over 2,000 high powered, fast moving diesel and diesel-electric locomotives and 5,800 new passenger cars, mostly manufactured from lightweight stainless steel, which were used to outfit hundreds of new streamlined trains on lines throughout the country (Board of Governors, 1946-1960). This investment of over one billion dollars was private ownership's final attempt to become competitive with highway-based transport in the passenger market. However, during this same period, automobile sales in the U.S. increased sharply, so the new rail investment did not produce significant increases in ridership and losses on passenger rail services continued to increase (Hosmer, 1956). Noting this trend, by the mid-1950's railroads began reducing the number and frequency of passenger trains they operated as well as abandoning entire intercity routes (Saunders, 2001; Martin, 1992). By the late 1960s, passenger railways in the U.S. were in terrible condition, with private ownership moving towards eliminating them entirely. Congress, however, was unwilling to abandon intercity passenger service and President Nixon was committed to protecting rail freight transportation. So, in 1970, legislation was enacted to nationalize passenger railways, creating the National Railway Passenger Corporation, soon after called Amtrak (Nice, 1998). The now freight-only private railroads took ownership of 97% of all rail track, including track over which Amtrak passenger trains would operate. (Dunn, 1998) The 3% of track that Amtrak retained ownership of was limited primarily to the Northeast Corridor. Most importantly, fully half of existing passenger trains were eliminated, destroying what once was a true nationwide network of lines. The U.S. was left with a number of disparate corridors in various regions of the country, with few if any lines connecting to contiguous and/or more distant regions.

At the same time as America's privately operated passenger railways were in decline, France's publicly operated railway network began a long period of reconstruction and renewal after the end of World War 2. By the late 1950s, most of France's passenger network was restored to commercial service. Then, in the early 1970's, partly in response to Japan's inauguration of its very high speed line between Tokyo and Kyoto and partly in response to the energy crisis of that

decade, SNCF began developing its own high speed technology. In 1981, France began operating its first dedicated intercity high speed rail trains between Paris and Lyon. The contrast with the United States was striking. At a time when Amtrak was struggling just to maintain a skeletal fleet of aged rolling stock running on deteriorated infrastructure—and receiving very little financial support from the federal government—SNCF could claim that its Paris to Lyon line was paying off its construction debt and earning a profit on its high speed train operations (Lynch, 1995).

FINANCING HIGH SPEED RAIL

High speed rail is a high capital cost undertaking because track and related infrastructure are engineered to very complex specifications and locomotives and rolling stock that are expensive to manufacture.[1] Studies have identified the cost of dedicated high speed line construction in France at around 10 million dollars per kilometer (Arduin and Ni, 2005). How did France afford these costs? Did the country do something new and different in financing high speed rail? Our research suggests that the underlying relationships between the government, SNCF and the private sector in financing high speed lines, beginning with the Paris-Lyon line, were quite similar to previous French financing arrangements dating as far back as the mid to late 19th century. Specifically, infrastructure construction costs were largely funded from direct government grants, from construction and manufacturing loans made by public investment banks and from public bond issuances. Private financial institutions and individual investors supported these loans by purchasing rail bonds, but that in no small measure was because they were shielded from excessive risk by government guarantees on the repayment of interest and

[1] The capital, operating, and maintenance costs of high speed rail projects are well documented in the literature and its overall high costs are frequently cited as a deterrent to implementation. The choice between dedicating a new line solely to high speed passenger operations and rehabilitating an existing line, which can support freight as well as passengers, is critical factor for the level of costs (Campos and de Rus, 2009; Kuhnimhof, 2007). Other factors which result in cost variations involve geography (the necessity of building tunnels/viaducts, etc) and the time frame for construction. Studies have identified the cost of dedicated high speed line construction in France at around 10 million dollars per kilometer. (Arduin and Ni, 2005)

principal. In addition, although the national railway company was responsible, until the 1990s, for paying debt service on construction loans, the government committed to covering any deficit that SNCF ran, so private investors were protected from insolvency (Perl, 1991: 376-379), just as they had been in the period before nationalization (Cohen, 2009: 15-19).

However, some financial arrangements for high speed rail involved greater private involvement. Construction was sometimes based on a specialized vehicle called a Mixed Economic Organization (*Société d'Èconomie Mixte* or SEM). By French law, the majority of capital in a SEM must be public, but private participation is also significant. For example, for the Paris-Lille line private sector shareholders included French, German, Japanese and Italian banks, plus insurance companies and others (Lynch, 1998). Public owners of stock included the cities of Lille and Roubaix and nearby municipalities that derived economic growth benefits from the line.

Furthermore, for its rolling stock purchases, SNCF sometimes sold high speed train sets, called Trains à Grande Vitesse (TGV), to a banking consortium and then leased them back for long term operations (Dobbin, 1993: 131). For design and manufacturing, SNCF contracted and worked closely with GEC Alsthom. In this way "SNCF…nurture(ed) its own (in-house) design and engineering capacity through close partnerships with (manufacturers), rather than leaving such efforts mostly in the hands of external designers" (Perl and Gilbert, 2012: 50). Perl and Gilbert suggest that SNCF's relationship with its TGV train set manufacturers was a form of public-private partnership. Others disagree, asserting that a true public-private partnership only exits when the private sector takes a significant risk with its capital investment and/or loans to a joint project. They consider French government contracts with manufacturers such as GEC Alstom as a traditional form of payment by the public sector to private vendors for services rendered (PIRG, 2012; Reinhart, 1991). We agree with the latter interpretation since GEC Alstom was assuming no risk in signing TGV manufacturing contracts with the government. They were simply operating as government contractors.

In sum, the French approach to financing high speed rail in the 1970s, 1980s and 1990s relied strongly on public grants, loans and subsidies to attract private participation. The government borrowed to fund the construction of rail lines and paid the debt service on the start-up costs that accrue before a line goes into operation, a procedure that, in project finance terminology, is called "covering the hole" during the "ramp-up" phase of project implementation. Funding for construction was sometimes carried out under the auspices of special investment vehicles, which integrated private financing with public subsidies. Finally, after the infrastructure was in place and trains were placed into commercial service, SNCF passenger revenues sometimes exceeded yearly operating and maintenance costs. But, if they did not, SNCF and/or the central government covered the deficits and, in addition, paid debt service on constructing the infrastructure. These arrangements assured that capital-intensive high speed rail lines could be built throughout France in the last three decades of the 20th century – a sharp contrast with the United States, where the national railway company, Amtrak, was constantly struggling to raise enough capital to just maintain its existing, often deteriorated infrastructure.

THE SOUTH EUROPE ATLANTIC LINE CONCESSION: A DIFFERENT KIND OF PUBLIC-PRIVATE RELATIONSHIP

The French approach to financing high speed lines meant that considerable debt was accrued from these highly leveraged projects. Less than a decade after the inauguration of Paris-Lyon, in the early 1990s, SNCF deficits had grown so large from new construction that the government was obliged to take over all of company's accrued debt. However, this did not solve the underlying problem since more lines remained to be constructed in the near future. It only transferred the debt to the Treasury Department. The central government therefore began looking for alternative financing approaches. Their first step was to separate construction and maintenance of infrastructure from train operations. In 1997, a new government agency, the French Rail Network (*Réseau Ferré Francais* or RFF), became responsible for constructing and maintaining all existing as well as future French rail lines while SNCF retained control of train

operations. This also brought France into conformity with European Union Directive 91-440, which required member nations to separate ownership and management of rail infrastructure from operations. But, even with SNCF out of the picture with regard to new line construction, the central government remained responsible for debt service on construction costs, so the problem was not fully resolved. Thus, a more radical step was taken – a decision to increase the role of the private sector. This led to the first high speed rail line in France to be financed through a public-private partnership, or P-3 agreement.[2] Specifically, in June, 2011, the French government signed a €7.845 billion (approximately $10 billion) contract with the LISEA Consortium, led by Vinci Construction SA, to design, build, operate and maintain a 184 mile long rail line between Tours and Bordeaux called the South Europe Atlantic High Speed Line (*Ligne à Grande Vitesse Sud Europe Atlantique*," or LGVSEA), which would become an extension of the existing Paris-Tours high speed line. Construction began in early 2012 and trains are projected to begin operating under LISEA auspices in 2017 (Reuters, 2011).

The specific financial terms of the LISEA agreement with the French government are shown in Table 1, below.

[2] Note, however, that P-3s are not a fixed, unchanging type of agreement, with a single structure. Instead, they vary from project to project. A large literature exists on P-3s. Three of the best works that we have relied upon are: Reinhart, 1991; U.S. PIRG, 2011; and Hall, 1998.

Table 1

LGVSEA Financial Plan

	Millions of Euros	Percent
EQUITY		
Capital: stock purchases by shareholders (CDC Infrastructure, AXA Infrastructure, others)	7.726	0.1%
Pret subordonne d'actionnaires (Stockholders' subordinated loans) [a]	764.909	9.8%
Sub-total Equity	**772.64**	
GOVERNMENT GRANTS (2011 current value)	**4,039.325**	51.5%
SENIOR DEBT		
Direction des Fonds d'Epargne (DFE): savings funds guaranteed by Reseau Ferre Francais (RFF) [b]	757.192	9.7%
European Investment Bank (EIB) long term loans [c]	600	7.6%
Commerciale Garantie Etat: bank loans guaranteed by government	1,060	13.5%
Commerciale Projet: commercial bank project loans, not guaranteed	611.576	7.8%
Sub-total Senior Debt	**3028.77**	
INTERETS DE TRESORERIE (Net d'impots): interest earnings net of taxes [d]	4.346	0.1%
TOTAL FINANCING	**7,845.074**	

[a] Shareholders loan capital to project; receive principal and interest repayment as opposed to dividends.
[b] Savings funds come from Caisse des Depots et Consignations (CDC), a public-private French bank
[c] 400 million guaranteed by French government; 200 million non-guaranteed
[d] Cash deposited in Treasury Department account that earns interest, pays taxes, produces net earnings

As shown in Table 1, some aspects of capital funding under this plan are similar to arrangements developed under the original French model of using public financing for high speed rail. Specifically, the central government pays for 51.5% of the construction costs in direct grants. It also guarantees 63% of the private senior debt that comes from loans by 11 commercial banks (€1.672 billion), and RFF guarantees another 9.5% (€757 million) in savings bank loans. The European Investment Bank (EIB), an agency of the European Union, contributes €600 million in public capital, 7.6% of the project total. In short, public agencies are responsible for either directly funding or backing via guarantees 82.1% of overall project capital. While the private sector also leverages significant capital for the project, most of its borrowing is protected by public guarantees. Even the so-called "equity" of €772.6 million put up by private investors is not equity in the traditional use of that term. €764.9 million or 99% of the "equity" is, in fact, loans made by private investors who, instead of receiving stock dividends, will receive principal and interest on their loans. Only €7.7 million, or 1% of the equity, involve stockholdings in the traditional sense of that term (Guivarch, 2011).

Given these similarities with traditional high speed rail financing, what makes LGVSEA financing new and different? First and foremost, the government's contract with the LISEA consortium includes performance clauses that were never previously applied to SNCF's operation of French railways. Specifically, in return for investing capital and receiving a 50 year operating contract, or "concession," from the government, LISEA has assumed the risk that, if their investment does not generate profitable returns, they will be responsible for covering the losses. After construction of the new Tours-Bordeaux line is completed, LISEA will offer slots (*sillons*) to railway companies that wish to run trains at specific times of day. LISEA will be paid by the government for the number of trains that it runs. (This differs slightly from a typical rail performance measure, which is number of train passengers.) LISEA will also determine the fares for passengers riding those trains. Depending on the revenues it earns from passenger fares, LISEA may or may not earn a profit from its concession, or it may earn profits one year and not the next, depending on ridership levels. In short, for the first time in the history of French railways, performance risk has been included in a contract with private operating companies.

Second, whereas in the past SNCF was the sole operator of trains on high speed lines in France, in this new P-3 partnership, LISEA can bid out operating privileges to other private (or public) railway companies (Guivarch, 2011). This could break SNCF's historic monopoly on passenger rail operations in France, creating a more competitive environment, while at the same time allowing LISEA to offset some of its performance risk. By contracting with a variety of private railway companies, not just with SNCF, to operate its trains, LISEA has leverage to make deals that maximize profits on each of the slots it bids out.

Third, traditional rail infrastructure financing invoked the Dailly Law, which allowed companies building high speed lines to transfer the payments they received from the government—called "availability" payments—directly to their creditors following the construction period. With availability payments, private firms attenuated their credit risk. However, the Dailly Law is not applied to the LISEA concession. Instead, after constructing the South East Atlantic line, no availability payments can be made. Instead, the consortium will receive payments based on the number of trains they operate on the line. If they fail to meet the performance specifications in their contract with the government, their receipts will fall, compromising their ability to service their debt (Infrastructure Investor, 2011).

Fourth, whereas capital has traditionally been raised partly through bond issuances by public authorities, funds for constructing the Southeast Atlantic line come only from private commercial loans. Banks are at risk to lose over 25% of their loans, if LISEA does not earn sufficient profits on its concession to pay the debt service (the other three-quarters of these credits are guaranteed by the government) (Sitruk, 2011).

In sum, the financing of the Southeast Atlantic line involves significant changes from the French approach of the 1970s, 1980s, and 1990s. Private companies have agreed to accept performance risk in return for the opportunity to earn profits from passenger revenues. Some of the protections given to banks, such as Dailly financing and availability payments, are not used in this project. And SNCF's monopoly on operating passenger trains within French borders which, until 2011, was written into French law, has been broken with the agreement that other railway

companies can bid for slots to operate on the Tours-Bordeaux line (Guivarch, 2012). Seventy-five years after French railways were nationalized, the private sector has agreed to return to participating in the construction and operation of intercity passenger rail services and to take on the financial risks that are involved therein.

FINANCING HIGH SPEED RAIL IN THE UNITED STATES

In the 1960s, the federal government and the Pennsylvania Railroad jointly launched *Metroliner* service on the Northeast Corridor, public-private venture that put the U.S., arguably, at a more advanced state of financing and implementing high speed rail than France. But that advantage never gained any traction because Amtrak, the U.S. national railway company, was created mainly to prevent the total demise of passenger rail, not with any clear intent to improve services Nice, 1998) so *Metroliners* served only as somewhat faster trains than their predecessors, but never operated anywhere near very high speed. As a result, in the last 3 decades of the 20th Century, when France was building numerous high speed lines, nothing comparable occurred in the U.S. Plans for high speed trains were developed in various states in the 1980s and 1990s, such as Florida and Texas, but none came to fruition. Only relatively recently has a project been initiated, in California, that has received definite funding commitments and begun to move towards implementation. A comparison of the financial history of California's high speed rail project to French projects reveals a great deal about why passenger rail finance in the U.S. has been so difficult.

High speed rail in the U.S. has always stumbled over financing. In California, an early plan in 1981 organized by a group of private investors (named the American High Speed Rail Corporation, or AHSRC), called for building a 130 mile long line between Los-Angeles and San Diego.[3] AHSRC estimated the construction cost for the 130 mile long line to be $3.1 billion. Though most of these funds were going to be raised privately, the plan also relied on public support. On the public side, Amtrak loaned AHSRC $750,000 in start-up funds at the outset

[3] The deeper historical background to this proposal is that, not long after Amtrak took over intercity rail operations, the Federal Railroad Administration (FRA), in 1974, began investigating the feasibility of high speed rail, looking at the entire west coast, from the Mexican border in the South to the Canadian border in Washington State. Two years later, the FRA concluded that the "costs involved in the building and operation of a high speed…ground transportation system substantially outweigh(ed) the benefits to be achieved therefrom" (Thomas and Winestone, 1976: 33), damaging the prospects for high speed on the West Coast. However, FRA subsequently modified its position, in 1979, when it identified the Los Angeles-San Diego corridor as having excellent potential for high speed rail development (Smith and Shirley, 1987: 36).

(American High Speed Rail Corporation, 1983). In addition, the State of California then created a Commission (The California Passenger Rail Financing Commission Act, Chapter 1553, Statutes of 1982) that was authorized to issue up to $1.25 billion in revenue bonds after the new line was operational and earning revenues that could pay debt service on those bonds. AHSRC also relied on the federal tax code for depreciation and other tax credits that would reduce their expenses, an indirect form of public support. Mainly, though, AHSRC hoped to attract enough private capital to get the proposed line at least partially operational, at which time it would activate the revenue bonds promised by the State (AHSRC, 1983: 2-3). No government subsidies, loans, credits or guarantees were offered to start construction of the infrastructure because all of the capital for that purpose would come from the private sector. The main sources of private capital that were proposed were $500 million in equity, $350 million in debentures, $445 million in commercial bank loans and $364 million in supplier credits. The latter was expected to come from the Japanese National Railway Company, which had committed to supply its high speed train technology to AHSRC. The $500 in equity was supposed to come from "investors who would be economic beneficiaries from the project either through enhancement of land values, creation or expansion of markets, preferential treatment as a vendor or utilization of tax benefits" (AHSRC, 1983: 3). In other words, as in many 19th century rail projects, a major source of profit was expected to come from real estate and related development.

The project was quickly met with strong local opposition; did not have the full support of the Governor, Edmund Brown, who was unwilling to expend political capital to overcome opposition in local communities (Diridon, 2012); and was unable to complete its environmental review (Smith and Shirley, 1987: 36). Strict environmental regulations and political opposition – both of which have often triggered lawsuits that hold up rail projects – were major obstacles that could not be overcome. (In France, on the other hand, the central government has far more power to overrule local authorities, including the ability to take local land for a rail line through its powers of eminent domain.) By 1984 the Board of AHSRC realized that they were unlikely to be able to move forward and they abandoned their planned project.

Almost 10 years passed before California attempted any further high speed rail initiatives. Then, in 1993, Governor Pete Wilson signed Senate Concurrent Resolution 6, which created the California Intercity High Speed Rail Ground Transportation Commission. “The Commission was ordered to (develop plans for)…establishing passenger rail service between San Francisco and Los Angeles on trains travelling more than 100 miles per hour” (Boske and Cuttino, 2000: 14). In 1996, the Commission, in its final report, “affirmed the feasibility of high speed rail (between San Francisco and Los Angeles” (Boske and Cuttino, 2000: 14). Following this positive report, legislation was passed (Senate Bill 1420, signed in September, 1996) that replaced the Commission with a more powerful State Agency, the California Intercity High Speed Rail Authority (CHSRA), which was mandated “to direct the development and implementation of intercity high speed rail service (between San Francisco and Los Angeles” (Boske and Cuttino, 2000: 15). CHSRA was charged with developing a financial plan and, if possible, awarding a franchise for construction and operations.

Since then, five different financial plans have been proposed by the CHSRA, in 2000, 2008, 2009, 2011 and 2012, each one more expensive than its predecessor. In the most recent 2012 financial plan, the estimated cost of the over 500 mile long San Francisco to Los Angeles line has been reduced from the 2011 figure of $98 billion to approximately $68 billion – still a very expensive project. The cost reduction was achieved by proposing that trains entering Los Angeles and San Francisco move from dedicated track to existing intercity track, thus not having to construct vast new tunnels under the San Francisco peninsula and through other city centers, but rather sharing track with commuter trains and Amtrak at the start and end of the line. The French take a similar approach on their high speed lines. For example, on the new Tours-Bordeaux line, 38 of the 340 kilometres of the line is on existing track.

Table 2 shows that estimated total costs for the line have more than doubled since 2008, while the composition of funding sources has also shifted. Whereas 70.2% of funding was projected in

2008 to come from the public sector (State and Federal) and 21.7% from private sources, now the public contribution stands at 78.1%, with 11.2% from private sources.

Table 2:

Project Costs and Funding Sources

Year of Report	Cost Components (YOE $)									
	Federal	%	State	%	Private	%	Other	%	Total	% Total
2000	$ 0		$33,684	97.0%	$586	1.7%	$460	1.3%	$34,730	100%
2008	$19,289	45.7%	$10,347	24.5%	$9,151	21.7%	$3,439	8.1%	$42,225	100%
2009	$17,000	42.5%	$9,000	22.5%	$10,000	25.0%	$4,000	10.0%	$40,000	100%
2012	$55,350	56.4%	$21,290	21.7%	$10,983	11.2%	$10,450	10.7%	$98,073	100%

Two major public components of the current financing plan were put in place when California voters approved a ballot initiative in November, 2008, called Proposition 1A, which authorized the State to issue $9 billion in bonds to build the proposed line. The federal government also approved $8 billion in grants for high-speed, intercity passenger rail through the American Recovery and Reinvestment Act, signed into law by President Obama in February, 2009. Federal grants are supplemented by annual appropriations of an additional $2.1 billion, bringing total federal program funding to $10.1 billion. A significant portion of those federal high speed rail program funds are now available to California.

In its 2012 plan, CHSRA uses state and federal funds to build an “initial construction section” of the line in the Central Valley, mid-way between San Francisco and Los Angeles. Private construction firms will build this section based on design-build contracts, without taking on any financial risk and without any future financial commitments. Amtrak will run intercity trains on these tracks at faster speeds than they currently run on their own tracks in this region, but not yet at very high speed because catenary wires for that purpose will not yet be in place (CHSRA, 2012: ES-9). Subsequently, CHSRA hopes to find sufficient public funds to build what they call

an “initial operating section,” which would extend either north or south from either end of the initial construction segment of the line.

CHSRA has identified a number of publicly supported programs that could provide financing for construction of the initial operating section at the North or South end of the line. The main public resource is State of California bonding authority provided by Proposition 1A. Funding could also come from state cost-sharing with local jurisdictions through which the line would pass as well as contributions of right of way and “revenues from innovative uses of right-of-way/system facilities/equipment (e.g. renewable energy and telecom)” (CHSRA, 2012: 8.10). Finally, the federal government could take various supportive actions. It could extend the 80% match that is currently provided to major highway and transit projects to projects such as this one. It could create a dedicated trust fund to support high speed rail and/or could make long-term “availability” payments to private participants based on meeting certain performance criteria in terms of construction deadlines and maintenance of the line infrastructure. And the current federal “qualified tax credit bond” program could be broadened to cover high speed rail (CHSRA, 2011: 8.5-8.9). However, at this point in time, beyond the Proposition 1A State bonding authority, no actual federal or state commitments have been made for any of these proposed funding resources.

Once built, the initial operating section would, according to CHSRA projections, generate sufficient ridership revenue to pay yearly operating and maintenance expenses, though they would not cover debt service on construction loans. By demonstrating the passenger ridership potential of its initial operating segment, CHSRA expects to attract banks and other private investors, contractors and railway operating companies to join in a public-private partnership for finishing the full line from Los Angeles to San Francisco and then, possibly, to attract private companies to take over operating responsibility for the entire line (CHSRA, 2011: 8-11). However, accurate estimates of future travel demand by riders are very difficult to achieve and biased data are sometimes generated by project sponsors and supporters. A major study done for CHSRA by Cambridge Systematics (2006) has generated criticism that its methodology and

assumptions result in an overestimation of potential ridership (Brownstone et. al., 2010). On the other hand, data from France's actual implementation of high speed trains demonstrates that they did, in fact, attract new ridership. For example, the opening of Paris-Lyon line in southeast France in 1981, increased rail use by 75 percent by 1985. It was estimated that, of this new traffic, 18 percent was diverted from road travel and 33 percent from air travel (Colello, 1997). CHSRA's ridership studies project similar success in attracting passengers to its high speed line.

Building upon its ridership projections, CHSRA has projected as much as $11 billion in up-front private capital investment (CHSRA, 2011: ES-8) coming to its San Francisco-Los Angeles line from the following kinds of partnership arrangements with the private sector: first, award of a long-term franchise and concession to a consortium of investors--similar to the French LISEA Consortium--to design, build, operate and sections of the line; second, attracting partial financing for rolling stock from railcar manufacturers, relying on project revenues as security for repayment of loans taken out to build the train sets; third, making commercial, residential and other real estate development opportunities along the proposed line available to private developers; and, finally, attracting private investment based on federal loans, credits and guarantees (CHSRA, 2011: 8.11). Concerning this last option, the most important federal resource is the Transportation Infrastructure Finance and innovation Act (TIFIA), Section 1502 of Public Law 105-78, implemented in 1998, where the government "provide(s) credit instruments with flexible terms intended to mitigate co-investor concerns about investment horizon, liquidity, and short term risk associated with financing…transportation projects" (U.S. Department of Transportation, 2002: 23). These instruments include direct, secured loans from the federal government to a non-federal project sponsor as borrower; loan guarantees applying to the principal and interest on borrowing by a project sponsor; and lines of credit, which act as contingent federal loans in case project revenues fall below specified levels. In short, the federal government uses its powers as a financial intermediary to create terms and conditions that satisfy the demands of the private capital market in terms of their risk, exposure and coverage (Cohen, 2002: 18-19).

In sum, CHSRA has proposed a combination of public and private funding to construct and operate a more than 500 mile long very high speed rail line between Los Angeles and San Francisco. Funds from Proposition 1A and from the federal high speed rail program are already committed to begin construction of an initial line segment in the Central Valley. Next, federal, state and local funds will support construction of an initial operating segment on the north or south ends of the Central Valley, though only Proposition 1A funds are currently available for that segment, which does not provide sufficient funding. Finally, institutional investors will provide up to $11 billion in capital, either through a concession agreement or other negotiated public-private arrangements. The terms and conditions of that partnership, however, are not yet in place.

How does the plan for financing the Los Angeles-San Francisco line compare to the French plan for its Tours-Bordeaux line? First and foremost, where California relies largely on public funds to construct its line, with private participation only in the latter stages of the project, in France a private consortium will design, build, operate and maintain the entire Tours-Bordeaux line from start to finish. Because their proposals for a P-3 arrangement are hypothetical at this point in time, California authorities have also suggested that they might rely on “availability payments” for project finance. But, this is the same kind of financing that France used for over three decades—before Tours-Bordeaux—to construct its high speed lines, which is basically a publicly funded option with little or no up-front private capital investment, in which the only risk the private sector takes is to agree to meet certain construction, operating and maintenance standards and deadlines. Availability financing falls far short of the ridership risk contained in the French government’s concession agreement with the LISEA Consortium.

Second, in both France and the U.S., private banks, construction and engineering firms, manufacturers, suppliers, and rail operators have demanded a great deal of protection for the risks they take when investing in high speed rail projects. Thus, the LISEA consortium in France negotiated guarantees from public authorities for over 82% of their private loans and equity investments. When the CHSRA surveyed financial institutions, construction firms, equipment

providers, and railway operators, to assess their interest in a public-private partnership, these parties specified that, in return for taking ridership risk, they required a guarantee on revenues (Infrastructure Management Group, 2008: 12) and that they expected loans they took out to participate in either construction of the proposed line or manufacture of rolling stock to be directly supported by federal or state guarantees for repayment of principal and interest (Infrastructure Management Group, 2008: 6, 11, 12, 15-16). CHSRA's proposed reliance on the federal TIFIA program would meet these expectations, but because of the very high cost of the Los Angeles to San Francisco line, TIFIA guarantees would fall far short of matching the 82% in guarantees that the French government has arranged for its partnership with LISEA. California is still a long way from having lined up public credits and/or guarantees to support a public-private partnership for its high speed line between Los Angeles and San Francisco that are comparable to the French agreement with LISEA.

In sum, California has sufficient state and federal funding in hand to begin an initial construction segment of 130 miles of rail line in the Central Valley, albeit with track that lacks catenary and other infrastructure that would allow for fully high speed operations. CHSRA plans to bring this initial section up to high speed capability, and then extend it North and/or South towards San Francisco and Los Angeles. Financing for the additional operating segments has not yet been arranged, though CHSRA has identified a number of potential public funding resources. These public resources require new federal legislation to become effective. In its best-case scenario, CHSRA proposes to engage banks, railcar manufacturers, suppliers and rail operators in a public-private partnership involving credible ridership risk similar to the French concession with LISEA. Short of that, CHSRA proposes to use availability payments with limited performance risk. Construction of California's initial 130 mile Central Valley line segment could begin relatively soon, but the rest of the high speed line is not projected to open until after 2030. Meanwhile, in France, construction began on the Tours-Bordeaux line in 2012 and the line will go into service in 2017.

CONCLUSIONS

Two large questions informed the research for this article: first, how and why did the mid-20th century shift from private to public ownership, financing and operation of passenger railways affect the subsequent financing and development of high speed rail? Second, does high speed rail create opportunities for the return of the private sector to a significant role in passenger rail transport, such as financing and operating new lines? To answer these questions, we adopted a historical, cross-national approach, which is relatively unusual in the field of public policy. While a number of articles have been written about general lessons that can be learned from foreign experience with high speed rail, our approach analyzes the specific reasons why the U.S. has lagged behind other countries. France was selected as a comparison case because, first, its history of moving from private to public provision of passenger rail services closely paralleled American rail history up to the Great Depression; and, second, because the divergence between the two countries at the end of the Great Depression provides powerful evidence for analyzing the causes of the decline of U.S. passenger railways in the post-World War 2 period. Scholars can build upon our work by carrying out other cross-national and historical comparisons that further elucidate the reasons why high speed rail has succeeded so well in other parts of the world, but not in the U.S.

Based on the evidence, we argue that, from the beginning of railway development in the 19th century, France and the U.S. operated within very different institutional frameworks in financing their rail systems: France with an interventionist state; the U.S. with a more laissez-faire orientation. This led France, when its privately operated railroads were on the verge of bankruptcy in the Great Depression, to nationalize its railroads. The French government took over the accrued debt of its private railways, set boundaries on competition with other modes of transport, and began a long term program of investment in improving intercity passenger rail. By establishing firm financial and competitive foundations for its national railway company, France created the conditions within which SNCF could ultimately develop high speed trains. In the U.S., with its more free market orientation, the Roosevelt Administration rejected the options of

consolidating or nationalizing the private rail industry and allowed competition with highway-based transport to continue unabated. With a reprieve from nationalization, railroad corporations attempted to revive their passenger services by investing in improved infrastructure and introducing faster trains called streamliners. However, when revenues continued to decline after the end of World War 2, railroads began eliminating lines. The federal government stepped in and nationalized passenger rail service in 1971. However, it provided its new national carrier, Amtrak, with very little financial support and made no commitment to developing high speed trains, even though, in cooperation with the Pennsylvania Railroad, it had developed high speed *Metroliners* as early as the mid-1960's. In short, where nationalization in France rescued passenger rail services financially and protected them in relation to highway competition—thereby establishing conditions for the eventual development of high speed rail—in the U.S. the public takeover of passenger rail occurred without any commitment to improved service, much less to high speed rail.

After the initial success of its Paris-Lyon high speed line in 1981, France used public financing to build a number of additional high speed rail lines and then to operate those lines under public auspices. In the process, its national rail company, SNCF, accrued a huge burden of debt which, in the 1990's, the central government assumed. The government then began looking for ways to entice the private sector to join in public-private ventures for constructing and operating passenger lines, thereby to attenuate its debt burden. (These initiatives also met European Union requirements that member countries increase privatization of their railways.) The first such venture involved a private consortium, LISEA, agreeing to participate in constructing and operating a new line between Tours and Bordeaux in return for taking on significant performance risk. The state of California is attempting to emulate France's privatization initiative in the financing of its new line between San Francisco and Los Angeles. However, as of the writing of this article, California has only managed to find state and federal funds to begin constructing a relatively short initial segment of this line. Both public and private financing for future segments remains unresolved.

These findings have important implications for managerial practices with regard to high speed rail planning and implementation in the United States. First and foremost, successful public-private partnerships require a strong government commitment to projects, with a fair allocation of risks to public and private partners. Otherwise either public and/or private participants will not be adequately empowered to make a project succeed. Second, high speed rail initiatives are most likely to succeed when project management is operating within an institutional, regulatory and legal framework that clearly defines roles and responsibilities for public and private partners. Regrettably, that framework is not yet firmly in place in the U.S., partly because no high speed rail projects have yet been implemented in the country, partly because regulation varies from state to state, and partly because state and local control of planning varies greatly across the country. Third, alternative plans should be developed for all components of a project, such as route alignments, because the institutional framework of rail development in the U.S. gives states and localities control over these and related decisions and they might not agree with the plans submitted by project managers. Fourth, project managers and planners are well advised to line up alternative funding sources in case any funding element falls through. Otherwise the entire project could fail as the result of unforeseen financial problems. In short, managers must be extremely flexible in planning and implementing high speed rail projects because of the complex and diverse legal and regulatory frameworks they face when implementing a project in the United States.

In the end, the most salient conclusion of our research is that public grants, loans and credit guarantees are required to attract private sector participation in financing high speed rail. Large institutional investors, railway construction and engineering firms, and rolling stock manufacturers will leverage funds to participate in high speed projects, but only if given public guarantees that greatly minimize their financial risk. The French agreement with the LISEA Consortium provides those guarantees, albeit at the cost of falling short of full privatization. This implies that California will need to find public funding to pay for a large proportion of the construction of its proposed line between San Francisco and Los Angeles. Public borrowing and public credit guarantees are the sine qua non for successful implementation of high speed rail.

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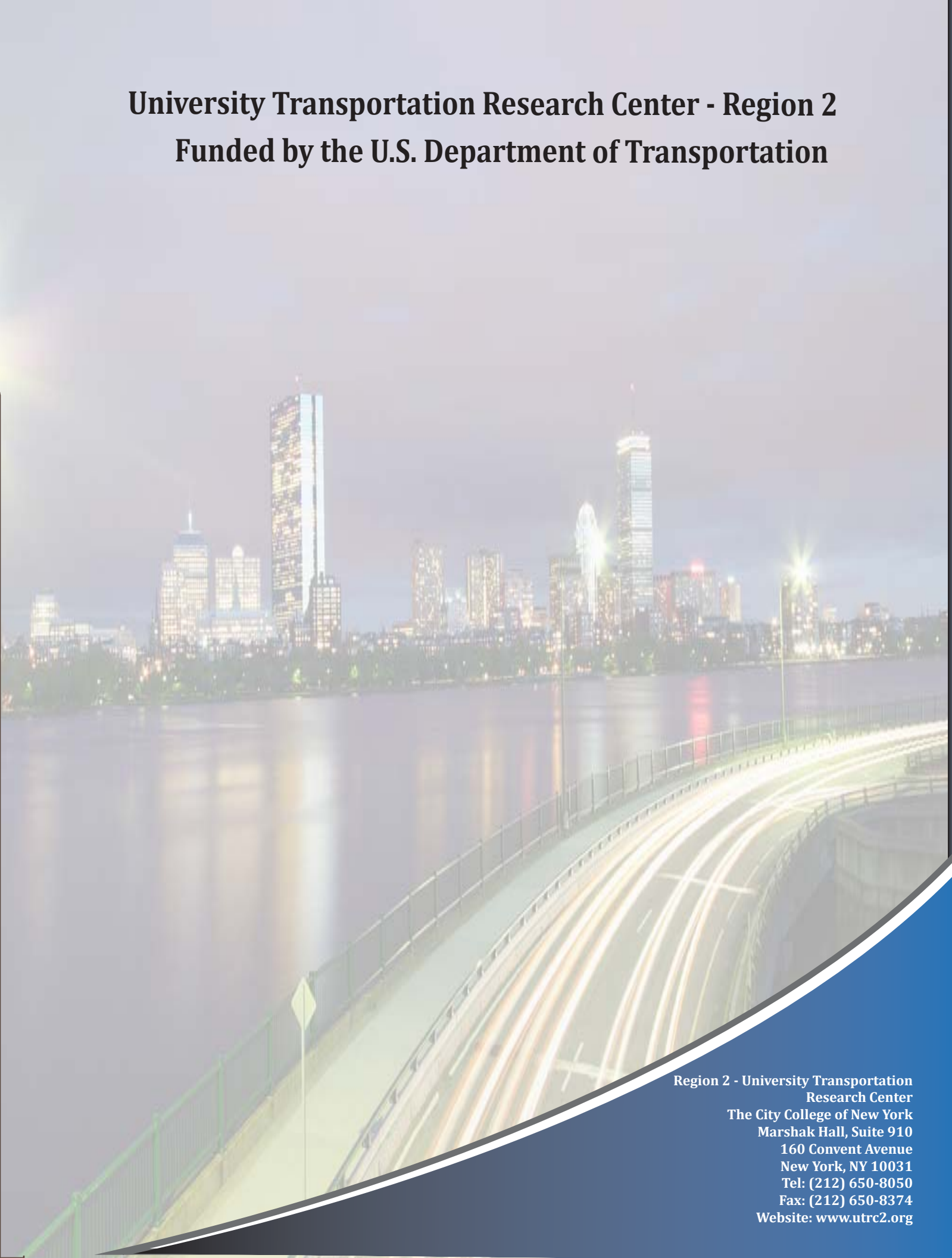

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