High Speed Rail Costs, Finance and Economic Development Potential

November 14, 2011

Thomas E. Lanctot
Principal and Group Head
William Blair & Company
312.364.8120
tlanctot@williamblair.com
Table of Contents

I. Overview of Private Investment in U.S. Infrastructure

II. Case Study
   California High Speed Rail Authority
   Draft Business Plan – Funding and Financing

III. Observations
Disclaimers

The accompanying information was obtained from sources which William Blair & Company, L.L.C. believes to be reliable but does not guarantee its accuracy and completeness. The material has been prepared solely for informational purposes and is not a solicitation of an offer to buy or sell any security or instrument or to participate in any trading strategy. The opinions expressed are our own unless otherwise stated. Additional information is available upon request.
Overview of Private Investment in U.S. Infrastructure
Private Infrastructure Investing

- Private investment in U.S. infrastructure continues to grow through both the monetization of existing assets and the development of new facilities.
- Successful Canadian, European and Asian models; catalyst American transactions for “trophy” assets.
- Substantial private equity capital has been committed by pension and sovereign wealth funds and other institutional investors seeking stable returns over a long-term.
- The market for private infrastructure investment remains immature with mostly “one-off” transactions.
- Political risk remains a major concern.
- Transaction structures typically involve long-term agreements or “concessions” of up to 99 years and are frequently referred to as “public-private partnerships” or “P3s.”
- P3s involve a contractual arrangement between public and private sector entities to:
  - Design, build, finance and operate/maintain a capital project
  - Monetize an existing public infrastructure asset or service
  - Transfer risks to the entity best able to retain and manage them.
Public Private Partnerships ("P3s")

Overview

- An **alternate delivery method** of financing and procuring public infrastructure assets:
  - Different from the historic pay-as-you-go approach and traditional bond financings
  - Increased value for money due to increased efficiency and risk transfer to the private operator

- A **contractual agreement** between a public agency and private partners to achieve:
  - Design, construction, financing and/or operation and maintenance of a capital project
  - Monetization of an existing or to-be-built public infrastructure asset
  - Transfer of various risks traditionally assumed by the public agency (such as revenue, operations, permitting, capital maintenance, construction)

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Revenue Generating Assets</th>
<th>Social Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>Toll roads and bridges</td>
<td>• Schools</td>
</tr>
<tr>
<td>Transit</td>
<td>Water and sewer systems</td>
<td>• Courthouses</td>
</tr>
<tr>
<td>Water</td>
<td>Airports</td>
<td>• Roads</td>
</tr>
<tr>
<td>Power</td>
<td>Ports</td>
<td>• Other assets that do not generate self-sustaining, or any, fees</td>
</tr>
<tr>
<td>Healthcare</td>
<td>Solid Waste</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>Other self-sustaining assets</td>
<td></td>
</tr>
</tbody>
</table>
P3 Models

Dynamics of a P3 are specific to the asset and the public agency

- Tailored to meet the *public agency’s* specific financial, policy and operational goals

---

**Two Broad Categories**

<table>
<thead>
<tr>
<th>Asset Monetization</th>
<th>Availability Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The public asset’s future revenues are monetized by the private party.</td>
<td>- The public entity pays the private partner rent-like “availability payments” that are based upon the availability of the asset to the public.</td>
</tr>
<tr>
<td>- The public entity receives and upfront payment, annuities, and/or a revenue sharing arrangement.</td>
<td>- Budget certainty for the public agency over the life of the contract.</td>
</tr>
<tr>
<td>- The private partner enhances, operates and maintains the asset based on contracted terms.</td>
<td>- The private partner designs, builds (or rehabilitates), finances, operates and maintains the asset based on strict delivery and performance requirements.</td>
</tr>
<tr>
<td>- Financial, operational, and maintenance risks are shifted to the private partner.</td>
<td>- The public agency’s payments may be reduced for underperformance or bonuses for exceptional performance.</td>
</tr>
</tbody>
</table>
Prospective Private Investors in HSR

**Infrastructure Equity Funds**
- Attracted to the stable cash-flows of a public infrastructure asset
- Can be a stand-alone fund, or part of a larger investing entity
- Provides capital

**Developers/Operators**
- Attracted to the possibility of creating value by optimizing O&M
- Experienced with similar asset class
- Critical in project delivery and ongoing operation

**Construction/Engineering Firms**
- Attracted to the possibility of generating incremental value by optimizing construction/rehabilitation phases
- Potential equity participation
Availability Payments

Application & Suitability

- Infrastructure asset that generates inadequate revenue to cover its costs
- A comprehensive solution to design, build, operate and maintain an asset for a set period of years
- Infrastructure assets that have been built around the globe using Availability Payment P3’s:
  - High speed rail
  - Courthouses and public buildings
  - Roads and bridges
  - Schools
  - Police and fire stations
  - Transit facilities
  - Hospitals and health facilities
  - Libraries
  - Water and wastewater treatment facilities
  - Streetlights

The Payments

- Can combine the design, construction, financing, operation and maintenance of a public facility into a single agreement and payment stream
- Pre-defined, performance-based payments from a public agency to a private partner
- Typically begin once asset is delivered and “available” for use
- Performance, quality and safety standards must be satisfied for the continuation of payments
- Payment frequency and profile can be tailored to meet public agency’s parameters: level, escalating, milestones, etc.
- Subject to appropriation, typically not classified as debt, subordinated to bond and other debt obligations
Cost Profiles of Traditional Public Capital Projects

Hypothetical Cost Profile for Bond Financed Capital Project

- Design/Build
- Operate & Maintain

Years
1 2 3 4 5 6 7 8 9 10 11 12 13...

Note: Payments and costs are not drawn to scale.

Typical Bond-Financed Project with cost Overruns, Delays and Deferred Maintenance

- Cost Overruns & Delays
- Deferred Capital Maintenance

Years
1 2 3 4 5 6 7 8 9 10 11 12 13...

Note: Payments and costs are not drawn to scale.
**Cost Profile of Availability Payments Structure**

- By combining the design, construction, financing, operation and maintenance into a single agreement with a private partner, the public agency can potentially obtain “Value for Money” and the faster delivery of well-constructed and maintained infrastructure projects.

- This approach can overcome not only delays and cost overruns, but meet the ongoing capital maintenance costs required for infrastructure assets over time.

*Note: Payments and costs are not drawn to scale*
Case Study
Denver FasTracks Eagle Rail Project

- The Denver Regional Transportation District (RTD) achieved financial closing in August 2010 on the first transit project to use an availability payment structure in the United States.
- The RTD explored a P3 structure for the Eagle section as a way to close a nearly $2 billion gap in the overall $6.5 billion FasTracks project.
- The $1.64 billion Eagle project will create approximately 35.2 miles of electrified commuter rail connecting downtown Denver with both the western suburbs and Denver International Airport at a cost savings of 30%.
- Monthly availability payments will be made to the project company over the course of 30 years. *Payments will commence only upon satisfactory completion of the project.*
- Significant safeguards have been built into the contract, including the right to terminate the service contract if the project significantly falls behind schedule or if several non-performance contingencies are met.
- RTD retains ridership/revenue risk.

Funding sources include:
- $1.139 billion in public sector construction payments
- $396 million in private activity bonds
- $54 million private equity investment
- $44 million in public sector service payments
Case Study
Los Angeles Metro

- Beginning in late 2007, the Los Angeles County Metropolitan Transportation Authority (Metro) implemented a program to consider all future projects for P3 delivery.

- Of 85 projects listed in Metro’s long range construction plan, 14 have been identified as having P3 marketability. 3 mass transit projects are currently being targeted for a P3 structure. These are:
  - Westside Subway Extension – A new heavy rail line that will connect downtown Los Angeles to the ocean and Westside.
  - Crenshaw/LAX Transit Corridor – An extension of the existing light rail system that will link LAX Airport to current and future rail lines.
  - Regional Connector Transit Corridor – a 2 mile long link between three existing light rail lines to be located in Downtown Los Angeles.

- Business cases and procurement plans are currently being developed for each of these three projects.
Undertaking a HSR Project Involves Multiple Risks

- **Design Risk**
  - The risk of potential flaws in the design of the asset, and their impacts on project outcome.

- **Construction Risk**
  - The risk of potential completion delays and cost overruns.

- **Operations Risk**
  - The risk of cost overruns during operations, and recurring O&M expenses.
  - Revenue/demand risk

- **Capital Maintenance Risk**
  - The risk of cost overruns for capital maintenance and/or expansion of an asset.

- **Finance Risk**
  - The risk of the non-availability of capital or the excess cost of capital (interest rates and/or rates of return)

May impact

Projected cashflows and ultimately the project's feasibility

13
The Private Investor Can Assume Varying Degrees of Risks and Involvement with the HSR Project

- **Design/Bid/Build**
  - Lesser government ownership
  - Lesser private party involvement

- **Design/Build**
  - Lesser government ownership
  - Greater private party involvement

- **Common P3 model with private financing**
  - Greater government ownership
  - Greater private party involvement

- **Build/Own/Operate**
  - 100% Privatized
  - Greater government ownership

- **Build/Own/Operate-Transfer**
  - 100% Privatized
  - Greater government ownership

- **Private Sector Owns and Operates**
  - 100% Privatized
  - Greater government ownership
Various Risks Associated with a HSR Project Can Be Transferred to a Private Investor

<table>
<thead>
<tr>
<th>Risk Transfer Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public/Private Partnership Type</td>
</tr>
<tr>
<td>Design/Build</td>
</tr>
<tr>
<td>Approvals</td>
</tr>
<tr>
<td>Environmental</td>
</tr>
<tr>
<td>Regulatory</td>
</tr>
<tr>
<td>Right of Way</td>
</tr>
<tr>
<td>Customer Acceptance</td>
</tr>
<tr>
<td>Rate Setting</td>
</tr>
<tr>
<td>Technology</td>
</tr>
<tr>
<td>Finance</td>
</tr>
<tr>
<td>Design</td>
</tr>
<tr>
<td>Construction</td>
</tr>
<tr>
<td>O &amp; M</td>
</tr>
</tbody>
</table>

Risk born by...

Public Entity

Private Party
Case Study – California High-Speed Rail Authority
Draft Business Plan – Funding and Financing
Background

- Californians voted in 2008 to develop a HSR program.
- $9.5 billion of general obligation bond funding approved – subject to conditions.
- Draft Business Plan issued November 1, 2011.
- Headline cost number increased to $98.5 billion from $43 billion.
- Most advanced HSR program in U.S.
- Contemplates significant private sector engagement.
- Reflects investor outreach.
- Program will take longer and cost more than originally projected.
- State Treasurer Lockyer commended a “more honest discussion with the public and policy makers about the costs, benefits and feasibility of the project.”
## Order of Magnitude Capital Costs

<table>
<thead>
<tr>
<th>Section</th>
<th>Length (approx)</th>
<th>Endpoints</th>
<th>Service Description</th>
<th>Incremental Cost (billions 2010$)²</th>
<th>Cumulative Cost (billions 2010$)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Construction Section</td>
<td>130 miles</td>
<td>Fresno-Bakersfield</td>
<td>Provides track and structures to support system spine</td>
<td>5.2</td>
<td>5.2</td>
</tr>
<tr>
<td>IOS-North</td>
<td>290 miles</td>
<td>Bakersfield to Merced and San Jose</td>
<td>Supports 220 mph HSR service; includes trains and systems. <strong>Ridership and revenues sufficient to attract private participation.</strong> Connects with regional/local rail for blended operations.</td>
<td>19.4 to 26.4</td>
<td>24.6 to 31.7</td>
</tr>
<tr>
<td>IOS – South</td>
<td>300 miles</td>
<td>Merced to the San Fernando Valley</td>
<td>Supports 220 mph HSR service; includes trains and systems. <strong>Ridership and revenues sufficient to attract private participation.</strong> Connects with regional/local rail for blended operations.</td>
<td>21.4 to 25.8</td>
<td>26.6 to 31.0</td>
</tr>
<tr>
<td>Bay to Basin</td>
<td>410 miles</td>
<td>San Jose and Merced to the San Fernando Valley</td>
<td>First HSR service to connect the San Francisco Bay area with the Los Angeles Basin.</td>
<td>14.2 to 17.3</td>
<td>40.8 to 48.3</td>
</tr>
<tr>
<td>Phase I Blended</td>
<td>520 miles</td>
<td>San Francisco to Los Angeles/Anaheim</td>
<td>Builds on Bay to Basin with blended operations with existing commuter/intercity rail, and additional improvements for a one-seat ride, connecting downtown San Francisco and Los Angeles/Anaheim. Caltrain corridor electrified for HSR, and new dedicated lines into Los Angeles and Anaheim.</td>
<td>14.1 to 18.0</td>
<td>54.9 to 66.3</td>
</tr>
<tr>
<td>Full Phase 1</td>
<td>520 miles</td>
<td>San Francisco to Los Angeles/Anaheim</td>
<td>Continues dedicated high-speed alignment in full from San Jose to San Francisco and into Los Angeles/Anaheim.</td>
<td>8.2 to 10.5</td>
<td>65.4 to 74.5</td>
</tr>
</tbody>
</table>

1 Decision on which IOS to advance will be made at a future date, as described in Chapter 2, A Phased Implementation Strategy.
2 Ranges reflect the difference between the combination of lowest cost feasible options and the combination of highest cost feasible options.

Source: California High Speed Rail Authority Draft 2012 Business Plan
### Business Model

<table>
<thead>
<tr>
<th>Governance</th>
<th>Infrastructure Delivery</th>
<th>Infrastructure Operations</th>
<th>Train Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ownership</td>
<td>Signals and system integration</td>
<td>Train dispatch/signaling</td>
<td>Passenger service</td>
</tr>
<tr>
<td>Safety standards</td>
<td>Superstructure construction</td>
<td>Infrastructure maintenance and renewal</td>
<td>Vehicle maintenance</td>
</tr>
<tr>
<td>Contract supervision</td>
<td>Substructure construction</td>
<td>Power provision</td>
<td>Vehicle procurement</td>
</tr>
<tr>
<td>Other government agreements</td>
<td>Build stations and depots</td>
<td>Station O&amp;M</td>
<td></td>
</tr>
<tr>
<td>Right of way</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental approvals</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: California High Speed Rail Authority Draft 2012 Business Plan*
Business Model

Build ICS | Build IOS | Build Bay to Basin | Build Phase 1
---|---|---|---
Governance | Environmental Approval and Preliminary Engineering | Federal Funding | State Funding

Public Sector

Private Sector

Design and Construction

Operations and Revenue

Maintenance

Private Capital

IOS Operational

Bay to Basin Operational

Phase 1 Operational

Source: California High Speed Rail Authority Draft 2012 Business Plan
## Business Model

<table>
<thead>
<tr>
<th>Contracting Option</th>
<th>Finance Based on Cash Flow</th>
<th>Cost Control</th>
<th>Key Constraints</th>
<th>International Precedents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Train operation franchise</td>
<td>Vehicles and train operator startup costs</td>
<td>▪ Control train O&amp;M costs</td>
<td>▪ Can only have one TOC for length of franchise</td>
<td>Some U.K. rail franchises</td>
</tr>
<tr>
<td>Infrastructure O&amp;M concession</td>
<td>Limited – via track access charge</td>
<td>▪ Contain infrastructure costs</td>
<td>▪ Interface with TOC and infrastructure construction company</td>
<td>U.K. HS1 (Channel Tunnel Rail Link)</td>
</tr>
<tr>
<td>Infrastructure DBFO</td>
<td>Limited – via track access charge</td>
<td>▪ All infrastructure costs</td>
<td>▪ Scale – capped at $10 to $12 billion by bonding/construction market capacity</td>
<td>Perpignan-Figueras $2 billion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Can be segment or subsection (e.g. tunnel)</td>
<td>▪ Need continuing appropriation to pay</td>
<td>Tours-Bordeaux $11 billion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Can have several sequential DBFOs</td>
<td></td>
<td>Dutch HSL $10 billion</td>
</tr>
<tr>
<td>Full System DBFO</td>
<td>All costs to extent revenues allow</td>
<td>▪ Most costs controlled</td>
<td>▪ Scale – limits to $10 - $12 billion of construction</td>
<td>Arlanda Airport Link</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Integration risk transferred</td>
<td>▪ Can only have one contract</td>
<td>Taiwan HSR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▪ Can assume O&amp;M of DB segments</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: California High Speed Rail Authority Draft 2012 Business Plan*
Funding and Financing - Overview

- Program to be implemented in phases to match available funding.

- Some significant assumptions:
  - No operating subsidies
  - Private sector involvement is feasible because each of the operating sections is projected to generate a net operating profit
  - Based on projected cash flows, nearly $11 billion in private sector capital is anticipated once operations begin
  - Federal funding will continue to be available
  - A new tax credit bond program will be authorized by Congress
Funding Sources

- Sufficient funding ($6 billion) is available to finance the “Initial Construction Section (ICS) Merced to Bakersfield:
  - Federal grants authorized under ARRA and HSIPR (FY 2010)
  - State general obligation bonds (appropriation required)

- Ridership revenues are projected to cover operating costs and attract private capital for construction of future phases.
Future capital costs are assumed to be funded from:

<table>
<thead>
<tr>
<th>Federal Programs</th>
<th>State</th>
<th>Local</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing transportation programs</td>
<td>State bond funds</td>
<td>Cost sharing</td>
<td>Equity</td>
</tr>
<tr>
<td>Dedicated HSR Trust Fund</td>
<td></td>
<td>ROW</td>
<td>Conventional project finance debt</td>
</tr>
<tr>
<td>Availability Payments</td>
<td></td>
<td>Innovative use of ROW</td>
<td>Private activity bonds</td>
</tr>
<tr>
<td>Qualified Tax Credit Bonds</td>
<td></td>
<td>Rentals/parking fees</td>
<td>TIFIA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Naming rights/sponsorships</td>
<td>RRIF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Incremental” tax revenues from development activity</td>
<td></td>
</tr>
</tbody>
</table>
Observations
Observations

- First mover advantage may have some value
- Notwithstanding the appropriate focus on private sector engagement, an unprecedented amount of public sector funding will be required.
- Business Plan also recognizes that the projected private sector investment is also without precedent and will require federal assistance – PAB, TIFIA, RRIF etc.
- While the California High Speed Rail Business Plan reflects improved and more conservative analysis, many assumptions remain optimistic and speculative.
  - Federal support vaporizing (at least in short-term).
  - Heavy burden of proof on ridership and revenue assumptions.
  - No operating subsidies.
  - Build it and they will come.
Observations

- Spirited Opposition.
  - The Wall Street Journal editorial Saturday, November 12, 2011 – “Train to Neverland.”
  - Congressman McCarthy/route of initial project
  - Public opinion
  - California State Legislative Analyst
  - Credible project skepticism

- Often a disconnect between public and private sector.
- Political risk
- Steep uphill climb