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The Tampa to Orlando High-Speed Rail Project:

Florida Taxpayer Risk Assessment

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Part 1

Introduction

Governor Rick Scott is evaluating whether to proceed with construction of the proposed Tampa to Orlando high-speed rail project. The potential cost to Florida taxpayers is a principal factor in this evaluation. Capital cost escalation, revenue shortfalls and higher than projected operating costs are common in high-speed rail projects. Governor Scott Walker of Wisconsin and Governor-elect John Kasich of Ohio have cancelled projects funded by the Obama administration's high-speed rail program and foregone the federal funding because of cost concerns such as these.

Construction cost escalation recently led New Jersey Governor Chris Christie to cancel a federally funded tunnel to avoid up to $4 billion in projected cost overruns that would have been the responsibility of the state's taxpayers.[1] Perhaps the ultimate example of an over-budget megaproject is the Boston "Central Artery" ("Big Dig") highway project, which exceeded projected costs by $16 billion, including interest.[2] While there was considerable federal funding in the project as originally planned, much of the cost overrun became the responsibility of Massachusetts taxpayers.

Florida taxpayers face two potentially significant financial risks from the project:

1. Capital Cost Escalation: If construction cost projections prove overly optimistic, costs could increase substantially from the current estimates. The state of Florida would be responsible for virtually all of any such increase. This report estimates that the cost to Florida taxpayers could be $3 billion more than currently projected.
2. Operating Subsidy Liability: If ridership and revenue projections prove overly optimistic, it could become necessary for the state to provide an annual operating subsidy for the service. A state operating subsidy could also be necessitated by operating costs that are greater than projected. This risk could easily run into the hundreds of millions of dollars per year.

These risks are explained in greater detail below.

Part 2

The Tampa To Orlando High-Speed Rail Project

The Tampa to Orlando high-speed rail project would operate 84 miles from downtown Tampa to Orlando International Airport, with three intermediate stations (Lakeland, Walt Disney World and the International Drive area). The line would be built and operated through a competitively procured "Design-Build-Operate-Maintain" (DBOM) contract with a private corporation (the builder/operator).

The project developer, Florida Rail Enterprise (a unit of the Florida Department of Transportation), characterizes the project as the nation's first true high-speed rail line. However, the proposed speeds are substantially below those of state-of-the-art high-speed rail systems in China, Japan and France, which operate from 34 to 70 percent faster on comparable segments. The Tampa to Orlando high-speed rail line speeds are more on a par with Amtrak's Acela service in the Washington to Boston corridor. Part of the reason for the slower speeds of the Tampa to Orlando line is its operation as a tourist rail shuttle service within the Orlando metropolitan area (See Part 4, Section A).

Capital Costs and Funding: The project is estimated to cost approximately $2.7 billion. The state has received grants from the federal government totaling $2.4 billion, which would make the projected financial obligation of Florida taxpayers approximately $280 million.[3] This report assumes that any cost above $2.7 billion will be borne by Florida taxpayers. Florida state taxpayers have already contributed most of the rights-of-ways (other contributors include taxpayer-funded city of Tampa, Orange County and the Orange County Airport Authority, as well as Walt Disney World), and the value of all that land is anticipated to approach $700 million.[4]

Florida Rail Enterprise assumes no need for ongoing subsidies, anticipating that commercial revenues (generated mainly by passenger fares) will be sufficient to pay for train operations and earn a profit for the builder/operator.

However, this report shows that the financial risk to Florida taxpayers could ultimately be huge and involve both capital cost overruns and operating subsidies.

Part 3

The Risk To Florida Taxpayers

There are two principal risks for Florida taxpayers: the risk of capital cost overruns and the risk that the completed system could require operating subsidies.

A. Risk of Capital Cost Overruns

If the capital costs to complete the Tampa to Orlando high-speed rail line exceed projections, Florida taxpayers would have to pay the difference. This potential capital cost overrun risk is evaluated by examining:

- The accuracy of international high-speed rail capital cost projections.
- The costs of the Florida project compared to those of the proposed California high-speed rail line (The California line is the only other genuine high-speed rail line[5] in the nation currently at a similar stage of implementation).

1. Accuracy of Capital Cost Projections: International Experience: International research indicates that high-speed rail projects often exceed their capital cost estimates. European academics Bent Flyvbjerg, Nils Bruzelius and Werner Rothengatter examined 258 transportation infrastructure "megaprojects" covering 70 years in North America, Europe and elsewhere.[6] They found that capital cost escalation from the point of project approval to completion can be as much as 50 percent to 100 percent above projections. The average capital cost overrun for passenger rail projects was 45 percent and *cost overruns above 40 percent in fixed prices are common, especially for rail projects and overruns above 80 percent are not uncommon*.[7] Moreover, they found that capital cost overruns were pervasive, occurring in 9 out of 10 projects. The following examples illustrate high-speed rail risks that have been assumed by taxpayers:

- The government of the United Kingdom has assumed £5.2 billion in debts of the builder/operator of the high-speed rail Channel Tunnel link to St. Pancras Station. This is in addition to the £1.7 billion that had been granted by the government to the builder/operator to construct the line.[8]
- The UK government has decided to sell this high-speed rail line for an expected £1.5 billion after it cost at total of £6.9 billion, a loss of well over £5 billion including debt service payments.[9]
- According to the president of the Korean national railway (Korail), the South Korea high-speed rail system had capital costs that were three to four times the original projection.[10]

- The Taiwan high-speed line was to have been built by a private company and operated by them without any government funding (Florida's plans also call for private operations without government subsidy). But due to huge losses, the Taiwanese government has taken control of the company's board and nearly $10 billion in debt has now been guaranteed by the government.[11]
- The projected costs of the California high-speed rail project escalated at least 50 percent from 1999 to 2008.[12]

If the Tampa to Orlando high-speed rail line experiences cost escalation typical of international high-speed rail projects, it will cost between $0.54 billion and $2.7 billion more than projected. Based on averages, most likely the overrun would be about $1.2 billion, all of which would be the responsibility of Florida taxpayers.

2. Comparison to the California High-Speed Rail Project: A comparison to the costs of the recently approved first segment of the California high-speed rail project suggests a greater risk to Florida taxpayers than indicated in the international research. The California high-speed rail project is intended to serve from Los Angeles to San Francisco in its first phase and is currently projected to cost approximately $45 billion. A considerable funding shortfall exists and it is not known when service will begin.

The cost of the Tampa to Orlando line is projected at $32.1 million per mile (based upon the cost of $2.7 billion), which is well below the estimated costs of the proposed California segment. This includes all projected costs for building the track, purchasing trains and building stations and facilities, divided by the number of miles (84). The initial segment of the California system is projected to cost $64 million per mile, for a total cost of $4.15 billion for 64 miles.[13] The California segment is not being built to full high-speed rail standards, because of a legal requirement that the line be usable by conventional Amtrak services if the Los Angeles to San Francisco project is not completed.[14] The line would be upgraded to full high-speed rail standards when and if the much longer route is completed.

As a result of this and other cost elements, there are important differences between the Florida and California projects (see Table 1).

Sufficient data are available from the California project to make a provisional estimate of the impact of Cost Elements 1 to 3 in Table 1 (right-of-way, trains and electric infrastructure). If the costs of the California project are adjusted to exclude right-of-way and to include the vehicles and electric power infrastructure (as in the Florida project), it is estimated that the cost of the California project would rise to $4.4 billion ($68 million per mile).[15] There are, however, other cost elements, for which comparisons cannot be as reliably made:

- The Florida project exhibits seven cost elements (numbers 4 though 7 in Table 1) that would tend to increase its costs per mile compared to the California project. Some of these elements could be significant, such as station costs, the additional stations, the maintenance facilities and train storage yards.

- Another significant cost element, viaduct construction (rather than at-grade construction) would influence the Florida project costs per mile downward relative to the California project (Number 11 in Table 1).

Table 1: Comparison of Cost Elements: Florida High-Speed Rail and California High-Speed Rail (Initial Segment)

Cost Element		Florida High-Speed Rail: Tampa to Orlando	California High-Speed Rail: Initial Segment: Corcoran to Borden	Expected Impact on Florida Project at California Costs
1	Right-of-Way	Already obtained. Not a part of the $2.7 billion capital cost projection	Included in capital costs	Florida costs per mile would be *lower* than California costs
2	Trains	Included in capital costs	Not included in capital costs	Florida costs per mile would be *higher* than California costs
3	Electric power infrastructure	Included in capital costs	Not included in capital costs	Florida costs per mile would be *higher* than California costs
4	Maintenance facilities and train storage yards	Included in capital costs	Not included in capital costs	Florida costs per mile would be *higher* than California costs
5	Administrative and train control facilities	Included in capital costs	Not included in capital costs	Florida costs per mile would be *higher* than California costs
6	Quality of Stations	High quality stations with four tracks in intermediate stations to permit skipping stations.	Basic stations designed principally for conventional intercity rail service. There would be only two tracks, which would make express service impossible, since trains cannot pass. These stations would need to be upgraded when high-speed rail service begins.[16]	Florida costs per mile would be *higher* than California costs
7	Intermediate stations	3	2	Florida costs per mile would be *higher* than California costs
8	Terminal (end of route) stations	2	0	Florida costs per mile would be *higher* than California costs
9	Construction Environment	80% urban, much to be built in constrained freeway medians. Flat topography.	35% urban, little constrained construction. Flat topography.	Florida costs per mile would be *higher* than California costs because construction in urban areas and more constrained environments is more expensive
10	High-Speed Rail: Route Standards	100% of route is high-speed rail standard	83% of route is high-speed rail standard	Florida costs per mile would be *higher* than California costs
11	Viaducts	20% of route[17]	40% of route	Florida costs per mile would be *lower* than California costs

Only sparse data are readily available with respect to cost elements 4 through 11, though available data provide some sense of the potential scale of the differences.

- Based upon California costs, it is roughly estimated that the Florida project would be $550 million more costly if the same share of its track was on viaducts.

- The Tampa to Orlando line has two terminal stations,[18] while the California Borden to Corcoran segment has none. The least expensive terminal station for which California planning data is currently available would cost approximately $850 million.[19]
- The Florida project also has three genuine, four-track high-speed rail stations, rather than the two basic stations in the California segment. Genuine high-speed rail intermediate stations in California range from $40 million to nearly $450 million in planning documents.[20]

The difference in cost (adding trains and adding electrification to, and subtracting right of way from, the California project) between the two projects shows the California project to be 111 percent more costly per mile than the Tampa to Orlando project ($67.8 million per mile compared to the projected $32.1 million per mile in Florida). This difference could indicate that the capital cost projection for the Tampa to Orlando high-speed rail project is exceedingly optimistic. If the Tampa to Orlando project's costs per mile equal those of the California segment, the capital cost could eventually reach $5.7 billion. This would increase the obligation of Florida taxpayers to $3 billion (see Table 2).[21]

3. The Risk to Florida: Capital Costs: International experience suggests a high likelihood that the Tampa to Orlando high-speed rail project will experience substantial cost overruns. The analysis above indicates that the additional cost to Florida taxpayers, above and beyond the $280 million commitment and the right-of-way contributions, could be from $540 million to $3 billion (see Table 2 and Figure 1).

Table 2: Range of Capital Cost Risks to Florida Taxpayers: Tampa to Orlando High-Speed Rail Project

	Estimated Capital Cost (Billions)	Overrun	Cost with Overrun (Billions)	Additional Cost to Florida Taxpayers (Billions)
State Commitment	$2.70	0%	$2.70	$0.00
International Research				
Minimum	$2.70	20%	$3.24	$0.54
Average	$2.70	45%	$3.92	$1.22
High	$2.70	100%	$5.40	$2.70
Comparison to California	$2.70	111%	$5.70	$3.00

Note: The additional cost to Florida taxpayers is above the $280 million already committed according to Florida Rail Enterprise.

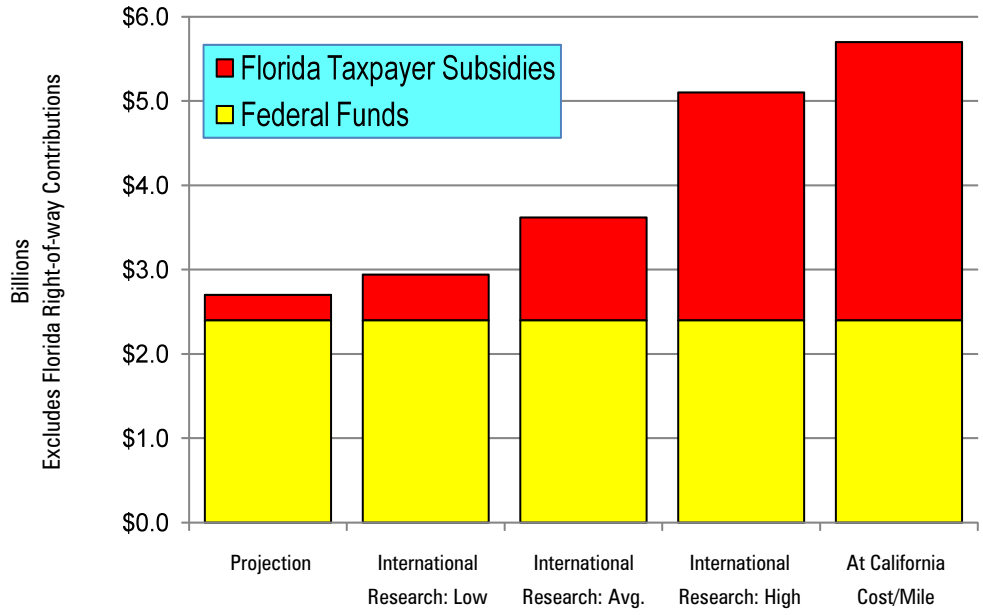
Moreover, it is possible that Florida taxpayers could be required to repay the federal grants. This would become necessary if the project should be cancelled after construction begins (such as because of capital cost overruns). This is illustrated by New Jersey, which has been billed by the federal government to return federal grants related to the tunnel project that was cancelled by Governor Christie due to the projected cost overruns that would have had to be paid by state taxpayers.

B. Risk of Ongoing Operating Subsidies

There is also a risk that Florida taxpayers will be required to subsidize high-speed rail line operations. This risk of ongoing operating subsidies is evaluated by examining:

- The attractiveness of train travel, by comparing door-to-door travel times between the train and trips by car.
- The accuracy of international high-speed rail ridership and revenue projections.
- The projected ridership and market served by the Florida project compared to the Amtrak's Acela Express.

Figure 1: Projected and Potential Costs and Subsidies
Tampa to Orlando High-Speed Rail Line



The Tampa to Orlando high-speed rail system builder/operator is expected to cover operating costs principally from passenger fares. This assumes that revenue, which is dependent upon ridership, will exceed operating costs, as is currently projected. If revenue should fall materially below projections because ridership is below projections or if operating costs are higher, operating losses would occur. The builder/operator might be able to assume such losses for a time. However, in the longer run a rational builder/operator would seek to renegotiate the contract to obtain taxpayer subsidies, terminate the contract, or even fail. Any of these events would require Florida taxpayers to provide ongoing operating subsidies, in addition to any capital cost overruns (see Part 3, section A, above).

1. Comparing Travel by High-Speed Train, Car, Taxi and Van: The Tampa to Orlando line would principally be a local tourist rail shuttle between stations serving Orlando International Airport, tourist attractions and hotels in the International Drive and Disney World areas. Nearly 40 percent of the projected ridership in 2015 would be between these three stations. Thus, the

ridership would be heavily weighted toward this 19-mile segment, which represents less than one-fifth of the route and is all located within the Orlando metropolitan area.[22]

Close examination shows that door-to-door travel times on the train are generally slower than by car and the costs are generally higher. As a result, the train is unlikely to be attractive for the local and short intercity trips that it would serve.

This is illustrated by looking at a set of trip examples. It is assumed that 10 minutes is required to transfer between modes of transport (car to train, train to car, taxi or van to train, train to taxi or van). This is a conservative assumption, since it assumes little or no time for waiting in a taxi queue, waiting for a driver or waiting for a transit vehicle. The 10-minute transfer time may be significantly understated for the Tampa station, which according to Florida Rail Enterprise "will likely be three stories above street level".[23] This will lengthen the time from leaving the train to obtaining transportation to complete the trip and could require considerable escalator and elevator capacity. Train travel times are from Florida Rail Enterprise documents. Car and transit travel times are from the Google Map trip planner.

Table 3: Trip Examples

Trip Example	Mode of Travel	Minutes in Train	Door-to-Door Minutes
Orlando Residential to Tampa Residential	Train & Car	46	103
	Car	0	90
	Train & Transit	46	170
	Train & Light Rail	46	155
Orlando Residential to Tampa Downtown	Train & Car/Taxi	46	90
	Car	0	90
	Train & Transit	46	134
Lakeland Residential to Tampa Downtown	Train & Car/Taxi	23	55
	Car	0	45
Orlando Airport to Hotel on International Drive	Train & Hotel Van	8	32
	Taxi or Van	0	28
Orlando Airport to Hotel at Walt Disney World	Train & Hotel Van	16	40
	Taxi or Van	0	34

Residential to Residential Trip: Orlando to Tampa: A train trip from the Lake Enola Heights residential area near downtown in Orlando to a residential area near the University of South Florida in Tampa (with connections from the origin and to the destination by car) is estimated to take 13 minutes longer than travel by car.[24] If a car rental is necessary, the train trip would be slower still because of the time necessary to obtain the car (and to turn it in on the return trip).

Connection by transit is reviewed because Florida Rail Enterprise has indicated that "most connections are expected to be via transit services" at the International Drive Station.[25] If transit is taken at both ends of the trip, the train trip would take 80 minutes longer than the car trip. The additional travel time could be greater, because it is likely that some time would be required for waiting for the transit vehicle to arrive at the Tampa station.

If the Tampa light rail system were available (it was rejected by Hillsborough County voters in 2010), the train trip would take one hour longer than the car trip. This light rail connection was examined because of statements to the effect that without the light rail line, the Tampa to Orlando line makes less sense. In fact, travel time to even the small part of the Tampa area that would have been accessible to the light rail line would have been 65 minutes longer than the car trip.[26]

Residential to Downtown Trip: Orlando to Tampa: A train trip from a residential area near downtown Orlando to downtown Tampa, with car connections, would take the same time as the car trip.

If transit is taken at both ends of the trip, the train trip would take 46 more minutes than the car trip. Again, waiting for the transit service could lengthen this time disadvantage relative to the car.

***Residential to Downtown Trip: Lakeland to Tampa*:** A train trip from a residential area near downtown Lakeland to downtown Tampa, with car connections, would take 10 minutes longer than the car trip.

***Local Tourist Rail Shuttle Trip: Orlando Airport to a Hotel on International Drive*:** A local tourist rail shuttle trip from Orlando International Airport to a hotel on International Drive would take four minutes longer than a trip by taxi or van. The train and van trips could take even longer, since there will often be a longer waiting period for the trip to commence (based upon train and van scheduling). Similarly, there may be additional wait time for hotel vans at the destination rail station.

***Local Tourist Rail Shuttle Trip: Orlando Airport to a Hotel near Walt Disney World*:** A local tourist rail shuttle trip from Orlando International Airport to a hotel near Disney World would take six minutes longer than a trip by taxi or van. Again, the train and van trips could take even longer, due to longer wait times at the airport and, for the train, longer hotel van wait times at the destination station.

Other factors could make the train less attractive. Train service will operate approximately hourly. Some trains will operate as expresses, skipping stops. As a result, it seems likely that not all trains will stop at Lakeland and perhaps other stations. Because of the less frequent service, gaps of two hours between trains could occur at intermediate stations. Thus, travelers will be at the mercy of the less frequent train schedule, as opposed to having the freedom to leave by car whenever it is convenient. This could make it necessary for a person traveling from Orlando to downtown Tampa, for example, to take an earlier train and arrive in downtown Tampa nearly an hour earlier than would be necessary by car to reach the appointment on time.

Current project documentation does not include detailed fare information. However, the minimum fare between Orlando and Tampa is shown as $15. This would make the train costly compared to travel by car. The out-of-pocket cost of an Orlando to Tampa residential to residential train trip would be approximately double that of driving ($24 compared to $12). If a party of two traveled, the train trip cost would rise to 3.5 times that of the car trip ($39 compared to $12).[27] The higher cost of train travel could be a significant barrier to ridership, especially for the many family groups

that visit the Orlando tourist resorts. The cost could be at least $25 higher (one half of a $50 daily charge) if a rental car or a "zip car" (as suggested in Florida Rail Enterprise documentation) is required at the destination station.

The train is generally less competitive than might have been expected compared to cars, vans and taxis.

In the intercity markets, the train will generally provide no time advantage and appears likely to be more costly. In fact, for trips between the dispersed residential areas of Tampa and Orlando, travel by car will often be completed in less than the time it takes the passenger to reach the destination high-speed rail station, from which transportation would need to be arranged to complete the trip.

In the local Orlando tourist rail shuttle market, the train will generally provide little or no time advantage.

Road traffic congestion could improve the time competitiveness of the rail trip, though congestion could also be encountered in car trips connecting to and from the train. Planning documents assume that the congested travel time over the entire 84-mile route would add 15 minutes to the trip.[28] It seems unlikely that this comparatively short time would attract a large number of people out of their cars because many trips could require an expensive rental car or taxi ride to travel from the destination station to the final destination.

Because it would generally have no travel time advantage for most trips, the train may be less attractive to drivers and tourists. Many Orlando area visitors rent cars to quickly and conveniently move between the area's many tourist attractions. For these travelers, the train would be of little interest. The train is unlikely to be attractive to Orlando area residents for local rail shuttle travel, since they virtually all have access to cars. Even for intercity travel, such as Orlando to Tampa or Lakeland to Orlando or Tampa, the train would offer little advantage for most trips, even when traffic is congested, because of the highly dispersed nature of origins and destinations, which tend to be some distance from the rail stations.

All of this could lead to ridership and revenue well short of the projected and lead to the necessity of ongoing operating subsidies.

2. Accuracy of Ridership and Revenue Projections: International Experience: Flyvbjerg, Bruzelius and Rothengatter identified substantial overestimation in projecting ridership and revenue: "……the problem with cost overrun is exacerbated by the fact that often this problem comes hand in hand with lower-than-estimated revenues. The consequence is projects that are risky to the second degree."[29]

Flyvbjerg, Bruzelius and Rothengatter found that projected ridership on passenger rail projects averaged 65 percent above actual patronage. In particular, they noted:

> *There is a massive and highly significant problem with inflated forecasts for rail projects. For two-thirds of the projects, forecasts are overestimated by more than two-thirds.*[30]

Problems such as these have been evident in high-speed rail projects.

- The Taiwan high-speed rail project carries 44 percent fewer riders than projected,[31] with revenues therefore far below projection.
- The London to Paris and Brussels *Eurostar* carries less than one-half the projected ridership, even after 15 years of operation,[32] again resulting in lower revenues.

3. Comparison to Amtrak Acela Express Ridership: The Tampa to Orlando line ridership projections appear very high in relation to Amtrak's high-speed Acela Express service that runs between Boston and Washington, DC. The Florida project is predicted to carry 2.4 million riders annually, which is two-thirds the ridership on the Amtrak Acela Express service (3.2 million in 2010).[33] This could be difficult, in view of the much smaller size of the Tampa to Orlando market compared to the Boston, Philadelphia, New York, Baltimore, Washington, DC market. The Acela market has approximately eight times the population of the Tampa-Orlando market. The metropolitan areas in both markets have substantial tourist volumes.

4. The Risk to Florida: Ongoing Subsidies: Thus, there is a good chance that the ridership and the revenue on the Florida project could fall below projections and that operating subsidies could be required.

Further, if a shortfall in revenues leads to abandonment of the service by the builder/operator or a renegotiation of the contract, state subsidies would become necessary. If, for example, the projected ridership (and revenue as projected by Florida Rail Enterprise consultants) is 65 percent higher than actual ridership (as is indicated by the average excess of ridership projections over actual in the international research), the Tampa to Orlando high-speed rail line could incur operating losses of approximately $300 million in its first 10 years of operation (2015 through 2024). The system would not produce a profit for its first 23 years of operation (2015 through 2037), with accumulated losses of approximately $575 million.[34] Even larger subsidies would be necessary at projected levels of service, if operating costs are higher than projected. In the event that operating subsidies become necessary, the risk to Florida taxpayers could be reduced by strategies such as drastically reducing service levels and substantially increasing fares, both of which can be expected to reduce ridership.

Finally, Florida Rail Enterprise consultants have projected an apparently optimistic ridership and revenue growth rate following the opening of the system in 2015. From 2015 to 2035, ridership is projected to increase approximately 80 percent. This rate of increase could be aggressive, inasmuch as the population of the Tampa-St. Petersburg, Orlando and Lakeland metropolitan areas over the same period is projected to increase only slightly more than 30 percent.[35]

Closing the system could be an impractical option, because this would trigger a refund obligation of $2.4 billion in federal funds by the state of Florida. The maximum risk to Florida taxpayers would thus be $2.4 billion, though a smaller risk would be likely if the service continues to operate at a loss and no federal repayment is necessary.

Part 4

Related Issues

A. Tampa to Orlando Project Compared to State-of-the-Art High-Speed Rail

Florida Rail Enterprise claims that the Tampa to Orlando line will be "America's first true high-speed rail..."[36] In fact, however, the Tampa to Orlando line is more akin to Amtrak's Northeast Corridor Acela Express service. The speeds of the Tampa to Orlando line are far below those of world leaders China, Japan and France.

1. Similarities to Amtrak: The Tampa to Orlando train would briefly achieve speeds of 168 miles per hour,[37] somewhat faster than the brief 150 miles per hour reached by Amtrak's Acela Express. Express trains from Tampa to Orlando International Airport would operate at between 48 and 50 minutes over the 84-mile route, according to Florida Rail Enterprise.[38] If the trip takes 48 minutes, the average speed would be 105 miles per hour, while the average speed would be 101 miles per hour at 50 minutes, At these average speeds, the Tampa to Orlando high-speed rail line would operate either slightly faster or at the same speed as the 101 mile per hour (fastest) Acela Express service between Baltimore and Wilmington (Delaware). At an average speed of 91 miles per hour, a Tampa to Orlando train making all three intermediate stops would average 91 miles per hour, less than 10 percent faster than the 84 miles per hour of the fastest Baltimore to New York Acela train, which makes three intermediate stops.[39]

2. Differences from State of the Art High-Speed Rail: The world-class high-speed rail systems of China, Japan and France tend to have much longer distances between stops than the 21-mile average of the Tampa to Orlando high-speed rail line. However, some shorter intercity segments are operated at distances similar to that of the 84-mile non-stop Tampa to Orlando International Airport express service. Japan's 100-mile non-stop service between Okayama and Hiroshima averages 171 miles per hour. China's 75-mile Beijing to Tianjin non-stop service averages 149 miles per hour. France's 63-mile non-stop express from Charles de Gaulle Airport (Paris) to Haut-Picardie (Amiens) averages 141 miles per hour.[40] These services thus operate from 34 percent to 70 percent faster than planned for the Tampa to Orlando express services.[41]

3. Local Tourist Rail Shuttle Service: Finally the Tampa to Orlando line would provide local tourist rail shuttle service, a market not served by any high-speed rail line in the world. High-speed rail technology is excessively costly for providing a local tourist rail shuttle service. Local rail shuttle services are not provided, for example, by other high-speed rail lines that operate at 168 miles per hour or more in Europe, Japan or China.

B. Orlando to Miami High-Speed Rail Project

A high-speed rail line is also proposed between Orlando and Miami. Florida Secretary of Transportation Stephanie C. Kopelousos characterized the cost of the project "at an $8 billion range" in congressional testimony.[42]

Based upon the international experience (cost overruns of 20 percent to 100 percent, with 45 percent as an average), this project would appear more likely to cost from $10 billion to $16 billion. Moreover, based upon the costs of the California segment, costs could approach $17 billion (a 111 percent cost overrun).

Given mounting public concern about the size of the federal budget deficit, there appears to be little support for major new spending. At a minimum, major new proposed projects will likely be highly scrutinized on a cost-benefit basis. Moreover, the new Congress may not only decide to stop funding high-speed rail, but could reduce or even eliminate funding. In this environment, Florida state taxpayers seem likely to have to pay virtually all of the project cost.

Thus, the risk to taxpayers from the Miami to Orlando extension of the Tampa to Orlando high-speed rail project is very substantial.

Part 5

Options For Minimizing Risks To Florida Taxpayers

The two policy options below could serve the public policy goal of limiting the obligation of Florida taxpayers to the committed $280 million or less for the Tampa to Orlando high-speed rail project.

A. Cancel the Project

The additional liability to Florida taxpayers could be limited to zero by cancelling the project. This approach would also free $280 million in state taxpayer funding that would not be needed for the project for other transportation purposes.

B. Build the Project with Strict Financial Controls

Should the state decide to build the Tampa to Orlando high-speed rail project, every effort should be made to limit the obligation of Florida taxpayers to the $280 million commitment, and to avoid any new federal subsidies. The following provisions could minimize the risk of additional financial obligation to Florida taxpayers.

1. Builder/Operator Assumes All Risks: The builder/operator should be required to assume *all* risks for changes in costs and revenues from projections, except those changes required by the state ("change orders"). The builder/operator should be thus responsible for all changes in market prices, such as labor, material, land and any other changes. This would require the builder/operator to assume the same risk as it would assume in developing a major capital facility, such as a power plant or a large real estate development.

2. No Operating Subsidy and Builder/Operator Financial Guarantee: The builder/operator should be required to operate the high-speed rail line over the life of the contract with commercial revenues and require *no* operating subsidies. Any requirement for operating subsidies should cause the contract with Florida Rail Enterprise to be cancelled. The builder/operator and any corporate participants in any builder/operator consortium should be required to fund any anticipated operating subsidies that might be expected to occur for a period of five years after any contract is

terminated because operating subsidies are needed. For this purpose, the financial guarantees of the parent companies (whether U.S. or international) should be required.

3. Gubernatorial Approval of Change Orders: Any state authorized changes ("change orders") that would increase costs from the $2.7 billion level, increase operating costs or reduce revenues should be approved or rejected by the governor, with full public disclosure of (at a minimum), the justification and financial implications of the change.

4. No Government Guarantees: Under no circumstances should the state of Florida or any constituent government in the state of Florida provide any guarantee of debt or revenues to the builder/operator.

5. Financially Responsible Construction Staging: Because even the provisions above may not provide iron-clad protection from risks above the $280 million commitment to Florida taxpayers, construction should be staged in a financially responsible manner to make it virtually impossible to increase the liability of Florida taxpayers. A "minimum operable segment" should be built before construction begins on the balance of the system. For example, the Orlando local tourist rail shuttle segment (Orlando International Airport to Walt Disney World) might be built first. Construction of the next segment (presumably Walt Disney World to Tampa) would begin subsequently, assuming that sufficient funding for completion remains in the original $2.7 billion budget.

These provisions would be rigorous. However, anything less could, in effect, open the checkbook of Florida taxpayers, just as the "Big Dig" project did in Massachusetts.

If Florida Rail Enterprise has accurately projected the costs of the Tampa to Orlando high-speed rail project, these provisions will not only be achievable, but will be rewarded with responsive and responsible bids by builder/operators prepared to deliver the project within the $2.7 billion capital expenditure estimate and without operating subsidies. If no bidders step forward, that should be a signal to the state of Florida that the project is not viable or sustainable.

About the Author

Wendell Cox is principal of Wendell Cox Consultancy (Demographia), an international public policy firm and specializes in urban policy, transport and demographics. He has provided consulting assistance to the United States Department of Transportation and was certified by the Urban Mass Transportation Administration as an expert for the duration of its Public-Private Transportation Network program (1986-1993). He has consulted for public authorities in the United States, Canada, Australia and New Zealand and for public policy organizations and lectured widely. He serves as visiting professor at the Conservatoire National des Arts et Metiers (a national university) in Paris, where he lectures on transport and demographics.

Related Reason Foundation Study

The California High-Speed Rail Proposal: A Due Diligence Report, by Joseph Vranich, Wendell Cox and Adrian Moore, Reason Policy Study No. 370, September, 2008, http://reason.org/news/show/the-california-high-speed-rail

Endnotes

[1] In 2008$. Michelle Kaske, "It's Official: ARC Tunnel is Dead: N.J.'s Christie Pulls the Plug, *The Bond Buyer*, October 28, 2010, http://www.bondbuyer.com/issues/119_456/arc_tunnel_christie_veto-1019161-1.html.

[2] Calculated in 2008$ from data in Massachusetts Turnpike Authority, *Cost/Schedule Update of the Central Artery/Tunnel* Project, May 2007 (http://www.docstoc.com/docs/4261057/Cost-Schedule-Update-of-the-Central-Artery-Tunnel-Project) and Sean Murphy. 2008. "Big Dig's red ink engulfs state: cost spirals to $22b; crushing debt sidetracks other work, pushes agency toward insolvency," *Boston Globe*, July 17 2008, http://www.boston.com/news/traffic/bigdig/articles/2008/07/17/big_digs_red_ink_engulfs_state/

[3] In year-of-expenditure dollars (not inflation-adjusted dollars). Florida Rail Enterprise estimates the cost at either $2.6 billion or $2.7 billion (*Fast Facts,* http://www.floridahighspeedrail.org/fast-facts and *Florida's High Speed Rail Program*, http://www.floridahighspeedrail.org/storage/pi-docs/HSRProjectSummary121410.pdf). Florida Secretary of Transportation Stephanie C. Kopelousos indicated in congressional testimony on May 3, 2010 that the project was initially estimated to cost $2.6 billion (Subcommittee on Railroads, Pipelines, and Hazardous Materials of the Committee on Transportation and Infrastructure, House of Representatives, *High-Speed Rail Connections*, hearing, Miami, May 3, 2010. http://origin.www.gpo.gov/fdsys/pkg/CHRG-111hhrg56422/pdf/CHRG-111hhrg56422.pdf). In addition, approximately 5 percent of the federal contribution will be paid by Florida taxpayers ($120 million).

[4] David Miller, Scott Trommer and Kirk Claussen, *Memorandum: Attachment TO-7 Tampa-Orlando Financial Plan Memo*, The PFM Group, October 1, 2009.

[5] There are various definitions of high-speed rail. Most newer high-speed rail systems reach speeds of at least 150 miles per hour, while the Tampa to Orlando line will briefly reach speeds of 168 miles per hour.

[6] Bent Flyvbjerg, Nils Bruzelius and Werner Rothengatter, *Megaprojects and Risk: An Anatomy of Ambition,* (Cambridge, UK: Cambridge University Press, 2003). Flyvbjerg is a professor at the Oxford University in the United Kingdom. Bruzelius is an associate professor at the University of Stockholm. Rothengatter is head of the Institute of Economic Policy and Research at the University of Karlsruhe in Germany and has served as president of the World Conference on Transport Research Society (WCTRS).

[7] Ibid, p. 16.

[8] Department for Transport, *London and Continental Railways*, June 9, 2008, http://webarchive.nationalarchives.gov.uk/+/http://www.dft.gov.uk/press/speechesstatements/statements/londoncontrailwayslimited.

[9] Hazel Tyldesley, "High-Speed Rail Sale On Track To Net £1.5bn," *Sky News Online*, June 21, 2010, http://news.sky.com/skynews/Home/Business/High-Speed-Rail-Link-Sale-Launched-Government-Hopes-HS1-Will-Fetch-15bn/Article/201006315652761?f=rss

[10] David Briginshaw, "KTX Takes The Lead in Korea," *International Railway Journal,* January 2007, p. 21.

[11] The China Post, "Syndicated loans for debt-ridden high-speed rail granted," January 9, 2010. http://www.chinapost.com.tw/taiwan/national/national-news/2010/01/09/239973/Syndicated-loans.htm.

[12] Wendell Cox and Joseph Vranich, *The California High-Speed Rail Proposal: A Due Diligence Report* (Los Angeles: Reason Foundation, 2008), Table 7, p. 43, (http://reason.org/files/1b544eba6f1d5f9e8012a8c36676ea7e.pdf).

[13] Subsequent to this adoption, the California High-Speed Rail Authority approved an extension of the line to the south, but provided no detailed cost information because the preferred route has not been selected.

[14] This was necessitated because of a legal requirement that any portion of the line to be built have "independent utility"— that there must be an alternative use for the segment if the project is cancelled.

[15] To make the cost of the California segment equivalent to the Florida project, $175 million would need to be added for electrification, $350 million for trains and $275 would need to be deducted for right-of-way, for a net increase of $250 million (taking the cost of the segment from $4.15 billion to $4.4 billion. These estimates are based upon the author's examination of California project documentation.

[16] California High-Speed Rail Authority, *Agenda Item 3: Corridor Selection: Initial Construction*, meeting of December 2, 2010 (http://www.cahighspeedrail.ca.gov/WorkArea/DownloadAsset.aspx?id=9439).

[17] Florida Rail Enterprise, Florida High-Speed Rail Industry Forum: November 8-9, 2010, http://www.floridahighspeedrail.org/nov-2010-forum-docs/monday-nov-8-presentations/FLHSR_IndustryForum_110810-web.pdf.

[18] The Tampa terminal station is described by Florida Rail Enterprise as "likely" being three stories above street level and having the "potential to be one of the most visible, dominant and iconic architectural features of the city." Such a station would be very expensive.

[19] The least costly terminal station for which there is an estimate is in Oakland. The cost as indicated in the *Bay Area to Central Valley High-Speed Train (HST) Program Environmental Impact Report/Environmental Impact Statement* (2008) is adjusted from 2006$ to the year of expenditure dollars currently used by the California High-Speed Rail Authority.

[20] Current year of expenditure dollars based upon the *Bay Area to Central Valley High-Speed Train (HST) Program Environmental Impact Report/Environmental Impact Statement* (2008).

[21] The final cost, based upon the differences in the scope of the two projects could be above this $5.7 billion figure, depending on differences between cost elements that are estimated in Table 1.

[22] The Orlando International Airport to Disney World route is all within the local Orlando "Lynx" transit service area.

[23] Florida Rail Enterprise, *HSR Connections: General Station Planning Principles* http://www.floridahighspeedrail.org/hsr-connections

[24] Enola Heights was chosen because it is near the center of the Orlando metropolitan area and near downtown Orlando. The University of South Florida neighborhood was chosen to illustrate the potential of transit for the continuing trip from Tampa station. The area would have been on the proposed light rail line that was rejected by Hillsborough County voters in the November 2010 election.

[25] See: *HSR Connections: General Station Planning Principles* (http://www.floridahighspeedrail.org/hsr-connections). This assumption seems doubtful, because of the very low transit share of travel in the Orlando and Tampa-St. Petersburg metropolitan areas (less than 1 percent of travel) and the much longer travel times that would be required.

[26] It is estimated that the light rail line would have provided access to less than 2 percent of Hillsborough County residents and less than 1 percent of Tampa-St. Petersburg metropolitan area residents (based upon the international standard walking distance to transit of one-quarter mile). Author's estimates.

[27] Car operating costs are assumed at the average 2015 light vehicle fuel economy of 22.1 miles per gallon and $3.136 per gallon of gasoline (according to US Department of Energy projections released in December 2010). It is assumed that a round trip would be made in a single day and that the attributable parking charge at the International Drive station would be $5.00 (one half of a daily rate of $10.00). It is assumed that the traveler would be met by a friend or relative at the Tampa station and that the trip would be completed by car.

[28] AECOM Consulting and Wilbur Smith Associates, *Investment Grade Ridership Study: Summary Report,* prepared for the Florida High-Speed Rail Authority, November 2002 (http://www.docstoc.com/docs/52175515/INVESTMENT-GRADE-RIDERSHIP-STUDY-SUMMARY-REPORT). It should be noted that "investment grade" ridership studies are no guarantee of success. An investment grade ridership study was the basis of ridership projections for the Las Vegas Monorail, which filed bankruptcy in January of 2010, principally because ridership fell far short of projections (see Kyle Hansen, "Las Vegas Monorail Files for Bankruptcy Protection, *Las Vegas Sun,* January 13, 2010 and *The Las Vegas Monorail: A Unique Rapid Transit Project for a Unique City*, Thomas J. Stone, Ph.D., P.E.; Carlos A. Banchik, P.E.; and Jeffery B. Kimmel, Esq. http://www.monorails.org/tmspages/LasVeg5.html.

[29] Flyvbjerg, Bruzelius and Rottenberger, "Megaprojects and Risk," p. 14.

[30] Ibid, p. 26.

[31] According to Jessie Cheng, "High-Speed Rail Bidders Confident," *Taiwan Journal*, September 5, 1997 (http://taiwanjournal.nat.gov.tw/site/tj/ct.asp?CtNode=122&xItem=15627), the line was to carry 180,000 daily passengers in "the early operation." In the first 11 months of 2010, its fourth year of operation, the line carried an average of 101,000 daily passengers, 44 percent below projection. Taiwan High Speed Rail Corporation, *About THSR: Year of Operation Overview*, (http://www.thsrc.com.tw/tc/about/ab_operate_year.asp) accessed December 23, 2010.

[32] See Parliament of the United Kingdom, *Public Accounts—Thirty-Eighth Report,* http://www.publications.parliament.uk/pa/cm200506/cmselect/cmpubacc/727/72705.htm and BBC, *Eurostar sales up in 2009 despite travel chaos,* http://news.bbc.co.uk/2/hi/business/8469399.stm.

[33] Amtrak, *Monthly Performance Report for September 2010,* http://www.amtrak.com/servlet/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1249217386801&blobheader=application%2Fpdf&blobheadername1=Content-disposition&blobheadervalue1=attachment;filename=Amtrak_1009monthly.pdf [33] Amtrak, *Monthly Performance Report for September 2010,*

http://www.amtrak.com/servlet/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1249217386801&blobheader=application%2Fpdf&blobheadername1=Content-disposition&blobheadervalue1=attachment;filename=Amtrak_1009monthly.pdf

[34] Calculated from data in David Miller, Scott Trommer and Kirk Claussen, *Memorandum: Attachment TO-7 Tampa-Orlando Financial Plan Memo*, The PFM Group, October 1, 2009, http://www.dot.state.fl.us/planning/economicstimulus/hsr/TK2-15.pdf. In year-of-expenditure dollars.

[35] Calculated from Paul D. Swick and Margaret H. Carr, Geo Plan Center at the University of Florida, *Florida 2060: A Population Distribution Scenario for the State of Florida,* a research project for 1000 Friends of Florida, 2006. http://www.1000friendsofflorida.org/PUBS/2060/Florida-2060-Report-Final.pdf.

[36] http://www.floridahighspeedrail.org/storage/pi-docs/ProjectSummary_11092010abs.pdf

[37] Florida Rail Enterprise indicates that top speeds would be increased to 200 miles per hour after the Orlando to Miami segment opens. It is not clear whether this would require additional improvement to the line.

[38] Florida Rail Enterprise, *FAQS: Riding the Rail> Speed, Schedule, Fees> How fast will the train travel and what is the train schedule?*, http://webcache.googleusercontent.com/search?q=cache:MR89PNc9zl0J:www.floridahighspeedrail.org/faqs/riding-the-rail-speed-schedule-fees/how-fast-will-the-train-travel-and-what-is-the-train-schedul.html+%22he+trip+time+to+Tampa+will+be+just+under+an+hour+with+stops+and+approximately+48-50+minutes+non-stop.+The+service+will+be+approximately+hourly+between%22&cd=1&hl=en&ct=clnk&gl=us. This is a "cached" version of the source, which Google indicates was on the site on November 20, 2010. Projected travel times are not always achieved. For example, the Taiwan high speed rail line express service was to operate, terminal to terminal in 80 minutes.[38] The fastest trains on the current timetable take 96 minutes (see Joy Su, "High-Speed Rail Service will undercut air fares, *Taipei Times*, May 6, 2004, http://www.taipeitimes.com/News/taiwan/archives/2004/05/06/2003154305)

[39] Calculated from Amtrak public timetable at December 15, 2010.

[40] Calculated from Internet timetable resources, December 15, 2010.

[41] The lower figure assumes a 48-minute non-stop trip, while the higher figure indicates a 50-mile non-stop trip.

[42] Subcommittee on Railroads, Pipelines, and Hazardous Materials of the Committee on Transportation and Infrastructure, House of Representatives, *High-Speed Rail Connections*, hearing, Miami, May 3, 2010, http://origin.www.gpo.gov/fdsys/pkg/CHRG-111hhrg56422/pdf/CHRG-111hhrg56422.pdf, p. 22.

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