



Orlando-Tampa Intercity Rail Alignment Cost Comparison

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Railroad Consultants, PLLC conducted a cost comparison of two potential passenger rail routes between Orlando International Airport and Tampa: a modified version of the Locally Preferred Alternative (LPA) alignment along SR 528, and an alternate route proposed by Brightline Trains, LLC along SR 417. A team of civil engineers from Railroad Consultants, with decades of experience working for Class I railroads, analyzed both routes. We used the same industry standards and applied the same criteria to both cost estimates.

The Central Florida Expressway Authority Board (“CFX”) retained the Dewberry engineering firm to conduct a comparison of the two routes with the information available. At the July 20th, 2021, CFX board meeting, Dewberry stated that both routes are almost identical in length. The 528 route is approximately 17.4 miles, and the 417 route is 17.3 miles. However, the costs projected for those routes were significantly different, and based upon limited information (Brightline’s 15% design drawings and the 2010 High Speed rail plans). Since that CFX board meeting, two events have occurred that have provided more detailed and more relevant information. Brightline has submitted its more specific 30% design plans for the 417 route. Kimley-Horn, a nationally recognized planning and engineering firm, progressed design work of a system with the train speeds used by Brightline for the 30% design of the 417 route. Previous estimates of the 528 route did not have the benefit of this additional design work and so those estimates were based on the original 120 mph train speeds. Utilizing the same target design speed for both routes resulted in a significant reduction of the cost estimate for the 528 route.

To achieve the goal of providing the most current, accurate and equitable cost comparison (“apples to apples”), we started with the previous analysis conducted by Dewberry. We then analyzed the latest information provided by Brightline and Kimley-Horn and made the appropriate adjustments. For example, a cross-platform connection with SunRail was not included in Brightline’s 30% design drawings, while the 528 route included a transfer with SunRail as approved by the SunRail board in its 2018 PD&E report. Accordingly, the cost for additional track was added to the Brightline estimate to rectify that omission. In addition, there were certain areas where the route along 528 would incur cost increases beyond that provided in the prior report, and those costs were added. Where necessary, construction costs were updated to reflect market conditions for both routes.

We started with the cost estimates included in the July 20th, 2021, Dewberry report. We made the appropriate cost increases and decreases based primarily upon the information provided by the engineers since the July Dewberry report. Otherwise, costs projected by Dewberry were not modified except for an increase in retaining wall construction which was equally applied to both routes.

As reflected in the attached chart, we analyzed five (5) major construction categories of railroad design and construction. Each of those also affect the other project categories shown which are simply percentage increases of the base construction cost. We utilized the same percentages as Dewberry did in their review. The attached chart provides an updated cost comparison of the two routes, which concludes that these two routes of essentially the same distance, and operating with the same criteria, will cost essentially the same amount. The cost difference between the two routes is \$22 million, or less than 2% of the total project cost. **In summary, there is no significant cost difference between the two routes.**



The primary factor which has changed since the review completed in July was the reduction of the target design speed of the 528 alignment (previously 120 mph) to match the target design speed of the 417 alignment (90 mph). By equalizing the design speeds, Kimley-Horn was able to create a much more cost effective 528 alignment—one with the same geometric and operational criteria used for the 417 alignment. Applying equal standards also made it possible to position the alignment within the south side of the I-4 corridor in a way that does not interfere with the existing design or any potential value engineering for the Beyond the Ultimate plan, and thus avoiding unnecessarily inflated costs.

While every effort was made to hold each route to the same standard to produce a fair comparison, there are a few exceptions that should be noted. The 528 route includes a station at the Orange County Convention Center, which added costs to the total shown. Yet despite that additional cost for that station, the new 528 route cost projection is less expensive than the updated 417 route. In addition, the 417 estimate does not include any potential costs related to damages claims of the residents and merchants of the Hunter's Creek development or other adversely affected communities. The attorney speaking at the July hearing stated those damages could be more than \$100 million. Since the projection of such potentially significant damages is not part of our firm's expertise, we did not include such litigation costs in our construction estimate for Brightline.

The following chart shows 13 different cost categories and assigns costs to each for both routes. Cost increases and decreases from the July analysis are identified. On the pages following the chart, the reasons for the increases and decreases are explained.

Updated Comparison of Project Estimates for the 528 and 417 Routes

19-Oct-21

Dewberry's Preliminary Estimate Prior to Kimley Horn Design	\$1,664,000,000			Dewberry's Preliminary Estimate Prior to 30% Design Submission	\$1,058,000,000		
Item/Element Being Updated	Increases	Cost	Decreases	Item/Element Being Updated	Increases	Cost	Decreases
Track & Ballast	\$ 7,712,935	\$ 98,409,884		Track & Ballast	\$ 11,445,373	\$ 103,351,931	
MSE Walls	\$ 23,991,383	\$ 69,847,850		MSE Walls	\$ 75,088,801	\$ 171,430,725	
Bridges		\$ 237,680,864	\$ (309,092,458)	Bridges	\$ 26,860,392	\$ 197,616,672	
Civil/Site		\$ 188,415,694		Civil/Site	\$ 20,102,741	\$ 193,991,447	
Train Control & Signals		\$ 84,770,620		Train Control & Signals	\$ 9,638,314	\$ 93,009,734	
Contractor Indirect & General Costs		\$ 141,886,978	\$ (57,953,647)	Contractor Indirect & General Costs	\$ 29,904,779	\$ 158,658,653	
Station Building		\$ 114,000,000		Station Building		\$ 57,000,000	
Passenger Platform At-Grade		\$ 12,000,000		Passenger Platform At-Grade		\$ 9,000,000	
Professional Fees (Design /Permitting)		\$ 72,919,915	\$ (25,821,318)	Professional Fees (Design /Permitting)	\$ 13,324,111	\$ 75,772,555	
Project Management		\$ 31,251,392	\$ (11,066,279)	Project Management	\$ 5,710,333	\$ 32,473,952	
Construction Allowance/Contingency		\$ 117,429,474	\$ (41,582,382)	Construction Allowance/Contingency	\$ 21,457,010	\$ 122,023,336	
Land		\$ 78,674,604		Land		\$ 56,179,536	
Land Acquisition Support (Legal/Appraisers/Surveyors)		\$ 2,550,000		Land Acquisition Support (Legal/Appraisers/Surveyors)		\$ 1,300,000	
SR 528 Route - Updated Total	\$1,250,000,000			SR 417 Route - Updated Total	\$1,272,000,000		
Conclusion from Updated Comparison	<u>There is no significant cost difference between the two routes.</u>						

Explanation of Cost Comparisons

SR528 – Revised Cost Estimate \$1,250,000,000

Track & Ballast - \$7,712,935 increase

The quantity of track increased by 7,162 Track Feet. The track lengths are now based on recent design work and are thus more defined.

MSE Walls - \$23,991,383 increase

The quantity of MSE wall increased by 60,224 Square Feet. The MSE wall quantities increased as more track is supported on MSE wall in the current design than the previous 2010 High Speed Rail design which was designed for 120 mph trains. Another factor in the increase is that the unit cost for MSE walls increased approximately 30% to match the same cost criteria applied to walls on the 417 route.

The Railroad Consultants team confirmed these adjustments to the unit cost of the MSE walls with several contractors actively building MSE walls in the area. Based on those conversations and our own understanding of the access constraints, we are confident our unit cost increase is reasonable.

Bridges - \$309,092,458 decrease

To obtain a true and fair comparison of the operation of the two routes, the design speed should be the same. Kimley-Horn revised the 2010 plan to accommodate speeds of 90 mph, matching the design speed of the 417 route. This resulted in a reduction of 3.1 miles of bridge, which were replaced by lower cost MSE walls.

The adjustments described above directly modify the following items which are estimated simply as a percentage of cost:

Contractor Indirect & General Costs - \$57,953,647 decrease

Professional Fees (Design/Permitting) - \$25,821,318 decrease

Project Management \$11,066,279 decrease

Construction Allowance/Contingency - \$41,582,382 decrease

SR417 – Revised Cost Estimate \$1,272,000,000

Track & Ballast - \$11,445,373 increase

The quantity of track increased by 21,120 Track Feet. Two (2) miles of double track were added to the SR417 estimate.

1.25 miles of the two (2) miles of double track mentioned were added to conceptually provide infrastructure to the SR417 design, making a direct move to Tampa possible. The SR528 design already includes that capability. It is likely that for a project to utilize the outcomes of previously performed FHSR Tampa-Orlando environmental studies, such functionality would be required.

The remaining 0.75 miles of double track were added to conceptually provide infrastructure for a SunRail transfer station which is included with the SR528 plan. Both the 15% and 30% plans for the SR417 provide no infrastructure to support a SunRail transfer operation. Additionally, the 30% plans no longer propose the SunRail tracks and platform at Orlando International Airport (OIA). While these revisions would certainly reduce the SR417 project cost, the operations would no longer be equal which is needed to perform this cost comparison. Furthermore, the lack of a cross-platform transfer with SunRail is not consistent with Brightline's original proposal to FDOT and CFX.

MSE Walls - \$75,088,801 increase

The quantity of MSE wall increased by 536,640 Square Feet. While the entirety of Volume 3 – Structures Plans was redacted, we were able to calculate the amount of proposed MSE wall from the Volume 1 - 30% Design Track and Drainage Construction Plans by HNTB. We did also include 132,000 sq.ft. to conceptually serve as infrastructure to support the tracks needed for a direct move to Tampa which is described above in Track & Ballast.

In addition to increasing the quantity of MSE wall, we also increased the unit cost for construction. We increased the previous preliminary unit cost by 30% for walls less than 20ft tall and 50% for walls greater than 20ft tall, \$65/sq.ft. and \$75/sq.ft., respectively. The unit cost increase is due to three (3) primary factors:

- 1) Access to the majority of the proposed MSE wall is greatly constrained. Much of the track supported by MSE walls lies between SR417 and a combination of high-quality wetlands and private property. Poor access will protract the time needed to construct the MSE walls, and thus these MSE walls will cost more to construct.
- 2) Sources of the select fill necessary to construct these walls lie at a significant distance from the project which will increase transportation costs of the select fill.
- 3) Many of the MSE walls proposed are significantly taller than typical MSE walls found on roadway projects or other projects from which Brightline has experience.

Our team confirmed these adjustments to the unit cost of the MSE walls with several contractors actively building MSE walls in the area. Based on those conversations and our own understanding of the access constraints, we are confident our unit cost increase is conservative.

Bridges - \$26,890,392 increase

As indicated above, the 30% design plans for the 417 route do not provide for the ability to continue rail service toward Tampa because the route terminates on Disney property in the opposite direction. Since the 528 route does include the ability to continue to Tampa and in order to make an equal cost comparison, 1.25 miles of double track were added to conceptually provide the infrastructure needed to make a direct move to Tampa possible. That increased the quantity of bridge area by 57,750 sq.ft. Other than that, the bridge quantities and unit costs were not modified. Please note that the unit cost for bridge found in the previous preliminary estimates was approximately \$465/sq.ft. for the SR417 and \$531/sq.ft. for the SR528. With the entirety of the 30% Volume 3 – Structures Plans redacted; we were not able to review the proposed bridge construction to determine if a lesser unit cost on SR417 as compared to the SR528 would still apply.

Civil/Site - **\$20,102,741 increase**

While the route miles from OIA to the proposed Disney Springs station along the SR417 route did not increase and are still approximately 17.3 miles, for estimating purposes we increased the Route Miles for Civil/Site to 19.3 miles. This was done to estimate with the same consistency the addition of the 1.25 miles of double track previously mentioned and described to provide for a direct move to Tampa and the SunRail transfer functionality. No other modifications were made to this project element.

Train Control & Signals - **\$9,638,315 increase**

While the route miles from OIA to the proposed Disney Springs station along the SR417 route did not increase and are still approximately 17.3 miles, for estimating purposes we increased the Route Miles for Train Control & Signals to 19.3 miles. This was done to estimate with the same consistency the addition of the 0.75 miles of double track previously mentioned and described to provide for a direct move to Tampa and the SunRail transfer functionality. No other modifications were made to this project element.

The adjustments described above directly modify the following Items which are estimated simply as a percentage of cost:

Contractor Indirect & General Costs - **\$29,904,779 increase**

Professional Fees (Design /Permitting) - **\$13,324,111 increase**

Project Management - **\$5,710,333 increase**

Construction Allowance/Contingency - **\$21,457,001 increase**