

**Appendix B**  
**Evaluation of The Approach Taken In Our Paper,**  
**"If You Build It They Will Not Come – The Sequel",**  
**Using Acela's Ridership As A Baseline**

By William H. Warren – January 4, 2019

Readers are correct to ask, *"Since this type of competitive analyses of high-speed rail versus Auto and Air travel has not been done before, to this depth, how do you know your process produced meaningful results?"* It is fairly clear (as Part 1 describes) that the California High-Speed Rail Authority (CHSRA) has never done such competitive analyses; or if it has, such findings have not 'gone public.' In other words, the relevant question is do we, the authors, have a way to prove, or validate, that the process we developed is useful to predict the results of such future competitive struggles.

A reasonable way to validate the process would be to look at the publicly available data on Amtrak's Acela system and ask, *"How would Acela, today, stack up against our predictions of future competitive battles between HSR, Autos, and Air alternatives?"* We touched on this at the close of Part 1 of the Paper that that graphically shows the divergence of Acela's ridership history versus the California High-Speed Rail Authority's forecasted ridership accomplishments. Amtrak/Acela annual financial reports are the data sets for Acela, while our calculations from the 320 route analyses in MS Excel format provide the basis for the comparisons.

**HOW WE EVALUATED OUR PROCESS FOR COMPUTING RIDERSHIP** – To create meaningful comparisons, we focused solely on the process we developed for the California High Speed Rail Authority's False Phase 1's forecasted history (2033-2040). That's because the SV-CV Period (2029- 2032) does not include high-speed rail routes where the California trains will operate on distances that Acela presently covers on the Northeast Corridor, and the Authority's use of buses would create confusing comparisons. Included with this Evaluation is an Excel Workbook that is a modified version of the False Phase 1 Workbook, dated Dec.19, 2018. This Acela-focused Workbook is titled "Amtrak Acela Comparison of False Phase 1 Routes Dec-19 2018" we call "The Acela-CHSRA Workbook."

We have added three rows of factual Acela data next to three of the rows we developed that compare the CHSRA's trains with Auto and Air travel. This allows for a comparison of Acela to Autos and Air, as well as the comparison of the competitive positions of Acela compared with planned CHSRA offerings. [The other rows of California city pairs in the "The Acela-CHSRA Workbook" can be ignored.]

**Looking At The Comparisons** - The most interesting pair of Acela's cities in The Acela-CHSRA Workbook is found in the Non-Adjacent worksheet of the Acela-CHSRA Workbook. On Row 8 is Acela's Boston–Washington Union Station route; below is Row 9 that is CHSRA's downtown San Francisco–downtown Los Angeles route. The basis for choosing that route for an overall comparison is good. Boston is the northern end of the Acela route and Washington, D.C. is the southern end of the Acela route and there are about 440 miles between these two cities; while San Francisco is at the northern end of the CHSRA route, Los Angeles is the southern end, with about 470 miles between these two. Column A is highlighted in pink for Rows 8 and 9.

The Adjacent worksheet of the Acela-CHSRA Workbook provides interesting data for the other two pairs. First, Row 29 is now for Acela's Boston-New York City route. It is right above Row 30, which is CHSRA's downtown San Francisco-Fresno City CHSRA route. Second, Row 7 is now Acela's New York City-Washington Union Station route, right below Row 6 which is CHSRA's Fresno City-Los Angeles Union Station route. Column A is highlighted in pink for Rows 29 and 30, and 6 and 7.

**RESULTS AND CONCLUSIONS TO BE DRAWN FROM THE COMPARATIVE PROCESS** – The three most salient examples of Acela’s reality and our demonstrations of CHSRA’s weaknesses are:

- In the Non-Adjacent Routes’ worksheet, Row 8 is now the Boston-Washington Union Station Origin-Destination (O-D). The graphs in columns AZ to BB show that in this comparison of Total Travel Times and Total Travel Costs, Air travel wins, as it is much cheaper and much faster, as well being consistent with the UIC/IUR presentation mentioned in our Paper. Auto is also much cheaper, but Auto is only a bit faster than Acela. In Row 9, downtown San Francisco-downtown Los Angeles, Air travel wins again as it is cheaper and faster than HSR travel. While Auto is cheaper, it is much slower.
- On the Adjacent Routes worksheet, the graphs in columns BA to BC for Row 29, show for Boston-New York City, Air’s Total Travel Time wins over Acela, as does its Total Travel Costs. While Auto is also cheaper it is slower than Acela. In Row 30, downtown San Francisco-Fresno City, HSR wins as Auto is cheaper but slower, and Air’s Total Travel Cost is much more expensive, and its Total Travel Times is a bit slower than HSR.
- On the Adjacent Routes worksheet, the graphs in columns AW to AY for Row 6, Fresno City-Los Angeles Union Station, shows that HSR wins, as Auto is cheaper than HSR, but Total Travel Time is slower, and Air is much more expensive than HSR and just a bit faster. In Row 7, New York City-Washington Union Station, Air wins as it is Total Travel Time faster and Total Travel Cost cheaper than Acela. While Auto’s Total Travel Costs are also cheaper, its Total Travel Time is equal to Acela.

In summary, Acela won none of the three competitive analysis between Acela, Air, and Auto. Air won all three comparisons, because there is good air service into and out of these three Acela-served major cities (Boston, NYC, and Washington D.C.). Auto came in second place in 2 of the 3 routes, and on the third route (Boston-New York) it’s TTT (Total Travel Time) was 7 minutes longer than Acela, but Auto’s TTC (Total Travel Cost) was 40% of the TTC of an Acela ticket. For traffic to/from smaller cities along the Acela routes, Air would not be so dominant, as Air fares to smaller cities tend to be higher than rail fares. It appears that in the Northeast US, the Total Travel Times of both Acela and Auto are very close, while the Total Travel Costs of Autos is much less than Acela. Therefore, traffic to/from smaller cities will likely be dominated by Auto.

**ARE THE ACELA ROUTE CONCLUSIONS CONSISTENT WITH REALITY?** – What do these conclusions mean? We believe it shows this our process of step-by-step competitive Total Travel Time and Total Travel Cost analysis is an effective, rational process to do a comparison of different travel modes [Auto, HSR (or Acela), and Air]. We see the Acela-based conclusions are consistent with what we actually know from our 320 California comparative, competitive analyses.

We know Acela has taken a "high price strategy" because it is capacity-constrained and it has an high operating cost on a per passenger mile basis. However, even with their high operating costs, given their "high price strategy" Acela has a positive operating margin. We also know the airlines have the ability to put more capacity into play, and at much lower fare prices than at what Acela seems willing to sell tickets. The consequence is Acela's fairly low  $\pm 3.5$  Million passengers per year. This is both lower ridership than CHSRA forecasts for the last year of the SV-CV Period (14.4 Million in 2032) and very much lower ridership than what the Authority wishes to achieve by the fifth year of the False Phase 1 – 36.2 Million passengers per year in 2037.

This difference between profitable Acela and CHSRA's optimism to breakeven financially, is also seen in Acela's lower Load Factor than the CHSRA projections – A Load Factor being the number of passenger miles divided by the number of seat miles. Acela's Operating Reports shows a Load Factor of about 61%, whereas the CHSRA projects annual Load Factors of between 65% and 75%.

**Supporting Documentation** - These Acela operating results and the CHSRA projected results are discussed in the Comment submitted to the CHSRA regarding the 2018 Business Plan – found at: Appendix A of the paper, "If you Build It They Will Not Come – The Sequel"

Attachment 1 is the Excel "The Acela-CHSRA Workbook" referenced in this paper.

Attachments 2 to 4 of this Appendix C are 3 screen shots for Acela ticket prices and station to station run times used in "The Acela-CHSRA Workbook".

Attachments 5 to 7 of this Appendix C are 3 screen shots for Air ticket prices and airport to airport travel times used in "The Acela-CHSRA Workbook".