

City & County of Denver Public Works

Independent Review of CDOT Cost Estimates for I-270/I-76 Bypass Alternative and Report and Analysis by Sullivan and Tecza

March 28, 2013

Background:

Numerous alternatives have been considered and eliminated over the course of the I-70 East EIS process, which began in 2003. Some members of the public have asked for further information regarding an alternative of rerouting I-70 around Denver by utilizing the existing I-76 and I-270 highways and eliminating the portion of I-70 between Central Park Blvd and as far west as Wadsworth Blvd. In response to this request, CDOT has provided a series of estimates conducted by a variety of different methods to validate the elimination of the I-76/I-270 reroute alternative due in part to cost estimates at \$3-\$4 billion dollars. An external interest group being led by Frank Sullivan and Thad Tecza has provided an alternate assessment of the CDOT costs for I-76/I-270 estimating a total cost of \$1.5 billion. Since a large portion of I-70 runs through the City and County of Denver, the City as part of its ongoing due diligence, assembled a team from Public Works to independently reviewed all of these cost estimates and provide the following assessment.

This assessment is based upon members of the Denver Public Works staff from Construction Project Management, the Project Controls Office and Traffic Engineering Services reviewing the materials provided by Atkins, CDOT and Mr. Sullivan and Mr. Tecza. The team looked at the common components of the estimates to confirm the accuracy and validity of the methodology and acceptable/reasonable ranges or percentages within each of the cost estimates. Once validity of estimates was confirmed or denied the team provided an overview averaging the valid estimates to find a mid-point between the cost estimates.

High Level/Draft Cost Estimate Review:

The City of Denver began by reviewing the two cost estimates provided by both Atkins (CDOT's consultant on the I-70 East EIS) and the 2 additional estimates prepared by CDOT. The cost estimates range from \$3.3 to \$4.3 billion.

Atkins Estimate: The methodology used comparing preliminary cost estimating data from the I-70 East Project Corridor seems sound. These numbers are based on recent cost data and a much more detailed plan than the outside estimate. This corridor may be slightly more urban in character and might be slightly higher than what it would take to do the I-270/I-76 widening, but at a high level broad assessment and without more information, the assumptions are sound and the corresponding estimate is a good. The cost estimate by Atkins is presented as a range from \$3.79 to \$4.35 billion. There are other project elements and current unknowns in the I-270/I-76 Corridor that could actually make construction costs on par or even higher than the I-70 widening. These are as follows:

- The corridor is constrained in many areas by existing development, rail, local roads and drainage ways-Sand Creek, South Platte River, Clear Creek, floodplain, various ponds, private and public lakes and gravel pits and natural areas that will constrain widening. This network of inter-connected waterways creates an environment and ecosystem that will be impacted by the project and those negative impacts will have to be mitigated.
- Much of the existing roadway is on large fills forty to fifty feet high. Widening will require significant amounts of embankment and/or walls that will increase costs to related structures, ramps, and will require additional right of way.
- The current alignment abuts several residential neighborhoods in Commerce City, Adams County and the City of Arvada that may require sound walls.
- The corridor could have significant environmental issues related to current land uses for refineries, waste treatment, and other intense industrial sites that could contain contaminants and would require expensive mitigation.

For these reasons cost estimating at this high level should be conservative. This corridor is a complex urban mix and should not be compared to “rural” highway expansions in the State of Arkansas as suggested by the Sullivan and Tecza report or other projects that do not have similar characteristics.

CDOT cost estimates:

An independent in-house estimate was prepared by CDOT engineers using very approximate quantities and unit prices from their project database based on 2012 costs. Then percentages of the base cost were applied to other typical items of work in a format similar to that used for DRCOG and CDOT budgeting. CDOT prepared two additional estimates to help support the Atkins estimate. One estimate developed a cost per lane mile of highway widening based on completed projects with similar elements to the I-270/I 76 corridor. Actual projects costs were then adjusted for 2012 dollars. Both methodologies were reviewed and appeared sound.

Example Project from Highway Construction Costs published by the Washington State Department of Transportation (2004). (Sullivan & Tecza)

The Sullivan and Tecza Report used this publication as evidence that cost per lane mile calculations done by Atkins were unreasonably high and choose to use a figure of \$3.6 million per lane mile as a more reasonable figure. However, this data actually came from the State of Arkansas based on rural widening and is from 2004. What is interesting is the number and types of projects listed in the State of Arkansas Report that the Sullivan and Tecza Report did not choose to include in their analysis. In the report it is clear that the more urban and complicated the project, the more the lane mile costs increase. It was deemed that the Sullivan and Tecza Report cost estimate does not consider all the factors present in the I-270/I76 project hence was not included in the combined cost estimate average.

Additional project cost estimate

One such project that appears to be more similar to the I-270/I76 project, both in terms of complexity and in scope of work is the Katy Freeway Expansion in Houston Texas. The project team as added this

Average from CDOT & Atkins Estimate	\$4.05 billion
Average from Independent Check (CCD)	\$3.28 billion
(Actual project costs)	
Difference	-.77 Billion = within range of estimate/checks

Conclusion: Based on the information provided for review and independent research and evaluation, the City & County of Denver believes the estimates provided by Atkins for the cost of the I-270/I76 Bypass Alternative, are within a reasonable range. It makes sense that the estimate is slightly higher than the CDOT and Houston sample projects, as they are at an earlier stage of planning and the City team feels the estimates are a reasonable approximation of probable costs for high level planning purposes within 20% appropriate for high level planning purposes. For the reasons expressed earlier and the unknowns in the corridor, the City believes a conservative approach to project estimating is appropriate.