

# MESA ENGINEERING

ENVIRONMENTALLY CONSCIOUS CIVIL ENGINEERING

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January 10, 2010

Re: Comments on US 281 & Loop 1604 Interchange Construction and Draft CE

Dear FHWA, TxDOT, and Alamo RMA:

I am a professional engineer with over twenty-five years of experience and a wide variety of expertise in civil engineering and environmental issues. My background includes working in construction management, environmental projects coordination, biologic consultation and restoration, land development consulting, stormwater treatment, and transportation planning.

I have reviewed the draft 2009 "Categorical Exclusion for Proposed US 281 North at Loop 1604 Interchange Improvements" and schematics posted on the Alamo RMA website, as well as the 2009 Operational Analysis prepared by Rodriguez Transportation. I am also aware that Environmental Impact Statements are currently being prepared for both US 281 and Loop 1604. In light of this information, I have the following comments and concerns:

## Scope and Magnitude

The Alamo RMA is proposing to proceed with construction of four direct connectors and several miles of additional lanes to serve the US 281 and Loop 1604 interchange. The improvements that will be constructed under the proposed CE extend for approximately six miles along Loop 1604 and three miles along US 281. Four new access ramps are proposed, several lengths of new lanes will be added, and ancillary transportation facilities will be constructed. Some \$167 million is estimated for these improvements, which are predicted to result in a significant expansion in capacity at the interchange (see more below). The CE states that 10 acres of new impervious cover will be constructed. Further, the CE describes over 10 lane miles of new pavement to be constructed.

In my professional opinion, the scale, cost, capacity expansion, and construction activity associated with these improvements are all indicative of a major transportation project with significant impacts. The \$167 million price tag alone declares that these improvements are anything but appropriate for a Categorical Exclusion.

I have reviewed the categories and examples of actions for which a CE is appropriate, which are listed in FHWA regulation 23 C.F.R. 771.117. None of the 32 categories listed as appropriate for a CE would suggest that this interchange construction project could be covered under a CE. I would also not characterize these improvements as merely a safety project or an operational improvement. The interchange construction may impact safety or operation but I would predominantly characterize it as a major construction project with significant capacity expansion.

There is also a segmentation problem in that the work proposed under this CE is an integral part of the larger Loop 1604 project originally proposed under the 2007 EA, which is now subject to

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and superceded by the EIS process. It is very unlikely that the majority of the improvements at the US 281 and Loop 1604 interchange (four direct connectors and four new access ramps) will be significantly altered in any new construction in the next thirty years.

The specific improvements proposed under the CE, moreover, would represent the final configuration of the four direct connectors and operational access ramps corridor in this area. To build a project of this scale, and not intend that it would represent the majority of the final configuration for a project of this magnitude would be economically infeasible. Economically, the proposed cost of these improvements of \$167 million dictates that no additional major changes to the proposed improvements, using traditional engineering economics, be undertaken for 30 years.

#### Significant Impact on Travel Patterns

The proposed improvements have significant impacts on numerous aspects of the nine miles of transportation system improvements proposed. Four new access ramps will be constructed. This will affect access entitlement rights for 1,000 to 2,000 linear feet of private property at each ramp location. Three existing access ramps are proposed to be closed. These actions, the creation or closing of seven access ramps, will have a large impact on “existing travel patterns” causing the shifting of tens of thousands of vehicle trips per day (quite possibly 100’s of thousands by 2035).

The operational analysis discloses that the proposed improvements increase capacity by approximately 190%. (This increase in capacity is based on the existing traffic from the Operational Analysis of approximately 1,000 vehicle per hour per movement, and the capacity of a two-lane freeway, Level of Service C, from the Highway Capacity Manual 2000, page 13-13, of 2,930 vehicles per hour.) The resulting increase in capacity for the improvements almost triples the existing traffic volume based on existing 2006 at-grade movements.

#### Prejudicing Alternatives

Construction of the four direct connectors and associated improvements would unfairly prejudice consideration of alternatives in the not yet completed EIS processes for US 281 and Loop 1604. Without the benefit of an EIS analysis of the environmental constraints and operational function, the proposed construction will lock in key elements of the US 281 / Loop 1604 system and narrow the range of alternatives to be considered in the future.

For example, karst invertbrate Critical Habitat Unit 19 is very close to the improvements proposed under the CE, within the boundary of immediate impact, approximately adjacent to the merge lanes for the northbound US 281 to west bound Loop 1604 direct connection, about 1 mile west of the centerline of US 281. If the EIS analysis for Loop 1604 determines that a different alignment should be considered based on endangered species issues, having the interchange already constructed will limit such alternatives.

Other alternatives that come out of the EIS processes may also be operationally superior for the US 281 / Loop 1604 system when compared to the improvements proposed under the CE. The analysis of other alternatives and comparison to the proposed improvements cannot or will not be done without the completion of an EIS.

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### Noise Impacts

Noise impacts proposed in the CE report for receptors R1 and R2 (Harvest Fellowship Church) appear conservative. Similar receptors (R3, 4, 5 and 6) have projected 2035 noise levels (considering 490,000 vehicles per day projected traffic volume) that are four to eight decibels higher.

The reporting of noise impacts in the CE is misleading. Table 9: Traffic Noise Levels, page 45, lists six noise analysis receiver locations and five identified points of impact. The Mobile Source Air Toxics Emissions map (Figure 7 in the CE Report) shows six additional churches with schools and one elementary school that are not identified in the Noise Analysis.

Insignificant noise data is included in the CE to evaluate the impacts of the proposed CE improvements. The report does not show existing or proposed noise levels at any point other than the six noise receptors at five receiver locations. There are at least four other critical points within the boundaries of the project and adjacent to the R.O.W. that are not listed in the CE anywhere. One is the Christian Heritage Junior/Senior High School at 281 and Oak Creek Circle, the second is a single family residential neighborhood adjacent to the elevated connectors on Silverwood Drive and Donella drive on US 281, the third is the Peter Loring Mortuary at Gold Mine and Loop 1604, the fourth is the Sunset Funeral Home that is immediately adjacent to the “listed” Harvest Fellowship Church and school.

The critical land use elements with the highest impacts that are not appropriately identified in the report consists of the group of three churches with schools located at the southwest corner of the interchange. The Harvest Fellowship Church and playground is the sole use of the three listed in Table 9. All are directly adjacent to the R.O.W. and within 1,200 feet of the centerpoint of the intersection of US 281 and Loop 1604. *All three of these churches would be within the shadow of the overhead direct connectors.*

By not identifying the additional six critical noise elements listed in the CE on the MSAT map, and by omitting from the CE altogether at least four critical noise elements, the overall understanding of the noise analysis is compromised.

Beyond the identification of critical points of impact, noise abatement criteria considered in this CE uses \$25,000 for the cost-feasible level of mitigation for a single point of impact. Mitigation of impacts studied under the CE are considered to be non-feasible under the \$25,000 criterion for five of the seven points of analysis. An example would be the group of three churches at the southwest corner of the interchange.

In addition to the lack of details provided in the CE document, the \$25,000 mitigation criterion is significantly dated. McNerney and Landsberg, in a 1999 TxDOT/Center for Transportation Research publication in 1999 (1) say that the cost criterion is economically appropriate in 1999. Damnjanovic et. al., in a TxDOT/ Texas Transportation Institute publication in 2009 say that highway construction costs have doubled since 1997. These analyses highlight an under representation of the cost effectiveness criterion used in this analysis. An appropriate evaluation criterion should be much closer to \$50,000 than \$25,000.

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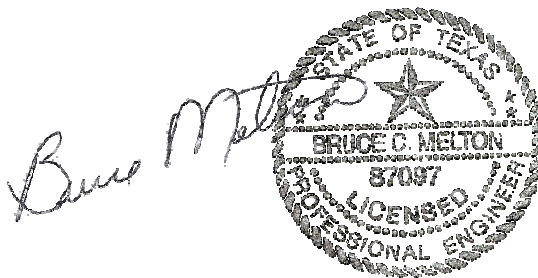
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Mobile Air Toxics

Mobile Air Toxic Emissions have also been shown to recently be much worse than previously understood. The CE report says that traditional engineering analysis shows that pollutant concentrations from transportation begin to diminish about 100 meters from the roadway and are indistinguishable from background conditions 500 meters beyond the edge of the roadway. New research from the University of Southern California (3) has shown that, in the early morning hours, pollutant levels can exceed even those found during peak travel times because of light winds that do not disperse the pollutants. The new discoveries also find that in these early morning hours (between 4 am and 7 am) high levels of pollutants can extend five times further than previously understood, to 2,500 meters from the roadway. The study says that these calm weather conditions are very common throughout the country. Clearly, a study of the breadth of an EIS is required to evaluate these new pollutant findings on the impacts of this.

Sincerely,

Bruce Melton



The image shows a handwritten signature of Bruce Melton in cursive, overlapping a circular professional engineer seal. The seal is for the State of Texas and contains the text: "STATE OF TEXAS", "BRUCE D. MELTON", "87087", and "LICENSED PROFESSIONAL ENGINEER". A five-pointed star is in the center of the seal.

References:

- (1) McNerney and Landsberg, The Validation of Cost-effectiveness Criterion for Evaluating Noise Abatement Measures, Center for Transportation Research, Texas Department of Transportation, April 1999.pdf
- (2) Damnjanovic, et. al., Evaluation of Ways and Procedures to Reduce Construction Cost and Increase Competition, Texas Transportation Institute, Texas Department of Transportation, January 2009.
- (3) Hu, Shishan, S. A. Fruin, K. Kozawa, S. Mara, S. Paulson and A. M. Winer, 2009. "A Wide Area of Air Pollutant Impacts Downwind of a Freeway during Pre-Sunrise Hours." Atmospheric Environment, Submitted for Publication.