

CE 466 Highway Geometric Design Homework 3

Due Tuesday, February 17, 2009

The purpose of this assignment is to familiarize you with the various factors considered in generating and screening a set of alternate route alignments.

The expansion of Houghton Road on the east side of Tucson has been under discussion for quite some time. Finally through the Regional Transportation Authority (RTA), passed in 2006, improvements have been authorized for this road corridor. The original studies for this corridor were conducted by the Arizona Department of Transportation (ADOT); these can be found at the following web site: <http://www.houghtonroad.com/projinfo.html>. From this web site, download the Houghton Road Corridor Final Report, dated October 2004 (approximately 6.4 MB). Read through this final report, and then answer the following questions.

Just as a point of interest, the City of Tucson has developed and maintains a web site with current information about the Houghton Road engineering studies: <http://www.houghtonroad.info/>. More recent engineering design information is contained here, although the design work is ongoing at this time.

Problem 1

- (a) What is the history of the functional classification of Houghton?
- (b) What is the selected design year for the re-design of Houghton? Does this seem reasonable?
- (c) What traffic conditions, for the design year, were considered in analyzing alternatives? Specifically, what traffic analyses are included *in this report*?
- (d) What design speed was used in comparing alternative alignments? Do you feel this is a reasonable design speed for this facility?

Problem 2

- (a) What existing route conditions were documented in the report? A short list, with a 1-2 sentence description of each, is desired.
- (b) What criteria were used in evaluating alternative alignments in this case? A simple list is all that is desired.
- (c) What are the major environmental impacts for the final proposed alignment? Go beyond a simple list to briefly describe each issue in 2-3 sentences. Within your description, be sure to list the advantages and disadvantages of the final proposed alignment.
- (d) Briefly discuss (in 1-2 paragraphs, no more than 1 page), *in your own words*, the major environmental mitigation efforts that are proposed for this roadway. You should describe the location of these mitigations, and you should discuss their impact on the geometry (horizontal alignment, vertical alignment, and cross-sections) of the roadway.

Problem 3

- (a) What role does access management play in the re-design of Houghton? Briefly (in a paragraph or so) describe why access management is an important element of this re-design.
- (b) Briefly identify and discuss (in 1-2 paragraphs), *in your own words*, the major access management controls that will be used for the proposed roadway.