

CE 467 / 567 Highway Safety and Operations
Homework 3

Due Thursday, September 26, 2006

Problem 1

Read the NHTSA report, *The Economic Impact of Motor Vehicle Crashes, 2000* [this is a PDF that can be found at electronic reserves]. Of particular interest are the Introduction, Human Capital Costs, and Appendix A.

- (a) What components are included in estimating the costs of crashes? Briefly itemize these components, and describe them in your own words.
- (b) From your answer to part (a), do you believe the list of costs is about right? Or, are there costs that should not have been included that are, or costs that should be included that are not? [Please give this a little bit of thought. A thoughtful 1-2 paragraph response is expected.]
- (c) Considering the information in Appendix A, and your response in part (b), does the magnitude of the values in Figure A-1 or Table A-1 make sense to you? [It is expected that you would spend some time considering each of the data items. A thoughtful 1-2 paragraph response is expected.]

Problem 2

The Regional Transportation Plan, and associated ½-cent excise tax, includes a number of explicit safety-related programs. These items (under “Safety Element”) and their expected costs in the RTA plan are found at:

<http://www.rtamobility.com/images/stories/pdfs/RTAPlan/RTACosts.pdf>

The funding here is in general categories; there is no mention of specific projects. [Of course, the RTA plan includes many projects that include safety elements. These other projects are *not* the focus of this question.]

Fatality rates for various crash types in Pima County can be found through NHTSA at:

http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/4_AZ/2005/4_AZ_2005.htm

Select the state of Arizona and the county of Pima. Other crash statistics for Pima County can be found in ADOT’s *Arizona Motor Vehicle Crash Facts*, found at:

<http://www.azdot.gov/mvd/statistics/crash/index.asp>

The latest version of *Crash Facts* is 2004. Chapter 2 describes crashes by geographic location.

It may also be noted that in 2004, Sun Tran recorded 1 fatality, 6 injuries, and \$57,388 in property damage. These are included in the state and Pima County statistics, but may be relevant on their own.

- (a) Do you believe that the five areas listed in the “Safety Element” of the RTA plan are the correct areas of focus? If you believe there are other areas that are more important, please mention these and describe why you feel this way. An answer of 2-3 paragraphs is expected.

There is no “right” answer, but you should develop a strong, coherent argument, using *quantitative* information as much as possible. In your answer, you might *explicitly* consider: (1) the types of crashes that occur in Pima County; (2) what fraction of these crashes (by crash type) might be amenable to correction (i.e., Could the fatalities, injuries, and/or PDO crashes be prevented by these engineering measures?); and, (3) whether the programs in the “Safety Element” are focusing on areas that could provide substantive reductions in the number of crashes in Pima County.

- (b) Conduct a critical analysis of the funding listed in the RTA plan. Specifically, consider the funding allocated to each of the five areas in the “Safety Element”. This spending applies to a 20-year planning period. Given your answer to part (a), and the costs of vehicle crashes from the NHTSA report (in Problem 1), are the funding levels correct? *Would the potential benefits in each of the five areas in the RTA plan exceed the expenditures?* You should try to support your argument in a *quantitative* way, as much as possible. Again, an answer of 2-3 paragraphs is expected.