

Infrastructure Management
Homework #1
Spring 2004
Due January 29, 2004 at start of class

Question 1 (10 pts): The Grant (1995) article distributed and discussed in class represents a broad call for action in improving public infrastructure. The Dunker and Rabbat (1995) paper is a more specific comparison of the various deficiencies of highway bridges.

Read the excerpt of the U.S. Federal Highway Administration's 1999 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance Report (Chapter 3, pp. 3-13 to 3-22). This has been posted to the course web page.

Considering only the results for bridges, review the statistics in the three papers and answer the following questions.

- a) Are the measures for 'condition' defined in each paper? Are the definitions consistent?
- b) Are the 'conditions' getting better or worse over time?
- c) The FHWA 1998 National Strategic Plan set a goal of only 25% of National Highway System bridges being deficient by 2008. Is this goal likely to be met?

Question 2 (10 pts): Most of the results in the three papers come from the National Bridge Inventory (NBI). You can find summaries of the results by state at <http://www.fhwa.dot.gov/bridge/britab.htm>

Dunker and Rabbat talk about the variations in bridge deficiencies by state. Look at the State Summary Data for Pennsylvania for 'NBI Report 2001'. Find the US total and Pennsylvania-only bridge inventory data for 2002. Note that it is broken up into NHS, non-NHS, and Total.

- a) Make a summary like Table 2a of Dunker and Rabbat for 2001 NBI data for Pennsylvania.
- b) Make a summary like Table 2a for 2001 NBI data for United States.
- c) Compare the Pennsylvania and United States data. In what categories is Pennsylvania better? In what categories is Pennsylvania worse?

Question 3 (5 pts): After reading these papers and looking at the NBI statistics, you have an idea about the data collected for all bridges in the U.S. and the way in which deficiencies are judged. Now that you have this information, would you suggest changes to how bridges are inspected and how deficiency reports are written? Think about this question as both a transportation decision maker and as a driver.

Question 4 (10 pts): Describe why asset management is such an important process for state and local authorities that are in charge of infrastructure. Be sure to consider economic and social impacts.