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Highway Electrification: The Implications of Uncertainty, by Kevin Nesbit.

Kevin Nesbitt is a graduate student at the Department of Civil Engineering, University of California, Davis, California. This award-winning paper appears in full elsewhere in these *1989 Proceedings of TRF*.

Because it can be made from a number of domestically produced renewable feedstocks and has the potential to reduce air pollution problems, electricity could become an important transportation fuel in the U.S. Current electric vehicles have a short driving range per charge, however, which limits their marketability. One strategy for eliminating the range problem is to supplement vehicle battery energy with electricity supplied through the roadway. If optimistic projections of technology improvement and cost reductions are realized, electric highways could be commonplace in the next century. This paper analyzes the uncertainties that will determine the fate of electric highways.

Cost-Effectiveness of Transit Versus Highways, by Dr. Fazil T. Najafi.

Dr. Fazil T. Najafi is Assistant Professor, Department of Civil Engineering, University of Florida, Gainesville, Florida.

The provision of comprehensive current cost information concerning the capital, operation and maintenance of highways versus transit in urban areas is a difficult task. This report compares the government costs of new highways in relationship to the development of a rapid rail transit system along a heavily congested urban corridor in Florida. The study corridor is the Tri-County Commuter Rail (TCCR) system which services Broward, Dade and Palm Beach counties. The rehabilitation of the 67-mile long TCCR has been completed at a cost of $66 million. The right-of-way costs were $264 million. In considering the right-of-way costs, the transit alternative is more cost-effective than a highway since a transit system requires substantially less right-of-way width than a six-lane highway. This is particularly applicable in the TCCR region where land is less available for development and right-of-way costs are extremely high. Other highway cost factors considered are low enforcement, liability, revenue losses from taxes on land, etc. Urban Mass Transportation Administration Cost-Effectiveness indices were analyzed and modified further for the inclusion of relevant infrastructure costs in selecting alternative systems.

Session 2-D: Highway Reauthorization: A Consensus for More R&D?

Session chair: David K. Willis, Senior Vice President, The ATA Foundation, Inc.

Summary by Session Chair:

There was no disagreement among the participants in this session that the federal government is under-spending on highway-related research and development (R&D) activities. Here's why:

Dave Willis noted that federal government-wide R&D expenditures for Fiscal Year 1990

will be approximately $65 billion, yet only $389 million (0.6%) of this total will be spent by the Department of Transportation. Dave Phillips indicated that total research and planning expenditures by FHWA will total $218 million this fiscal year, but Bob Reilly pointed out that fully $100 million of this total was for planning, not research. Thus, FHWA research expenditures currently total only about $118 million, or about 30% of the DOT total. Reilly went on to observe that, between 1967 and 1987, U.S. road mileage increased more than 20%, licensed drivers rose about 60%, but inflation adjusted FHWA highway planning and research (HP&R) dollars fell 45%. Phillips also remarked that one reason FHWA R&D expenditures are so low that money for research come out of the agency's general operating expense (GOE) funds, for which there is fierce competition.

Given these gloomy highway-related R&D expenditures trends, it is hardly surprising that Phillips stressed the need for FHWA to be spending more. In doing so, he presented the following figures:

FHWA Research-Related Expenditures
($, Millions)

	Current	Proposed
Highway Planning and Research (HP&R) (funds passed through to states)	150	200-300
Strategic Hwy Research Program (SHRP)	30	0
National Cooperative Hwy Research Program (NCHRP)	8	11-14
Federal Highway Admin.	30	250

Excluding $100 million for planning from both the "Current" and the "Proposed" columns, the "Proposed" column represents an increase in R&D expenditures from $118 million currently to $361 - $464 million. Phillips stressed that for the proposed expenditure levels to be realized, research dollars would have to come from a source other than FHWA GOE funds.

Much of Reilly's presentation focused on the American Association of State Highway and Transportation Official's (AASHTO) new publication Innovation: A Strategy for Research, Development, and Technology Transfer. The objectives of this report are: ". . . to evaluate the issues that will affect the future of highway and transportation research, (2) to recommend positions for consideration by AASHTO, as part of the Association's Transportation 2020 program, and (3) to consider current and prospective programs of research and provide AASHTO with the information needed to determine priorities."

Carlton Robinson outlined the Highway User Federation's views on a wide range of highway policy issues. He urged the audience not to be naive in its expectations about the outcome of the National Transportation Plan currently under development within DOT – "transportation nirvana" is nowhere in sight. On the other hand, he stressed that the nation will build new roads and that it will spend enough to keep the interstate highway system functional. (Interstate traffic now accounts for 22% of total highway travel.) Robinson joined Phillips in supporting the removal of FHWA R&D expenditures from the GOE account, and went on to argue that FHWA should earmark 4% of its total program funds for research and planning.

Willis concluded the session by noting that only $3.8 million of total DOT R&D funds are being spent on truck-related research – less than 1% of the DOT total – yet trucks account for 57% of total federal highway user revenues. He noted that trucking research appears to be getting "short shrift" in comparison to research expenditures by DOT on other transportation modes and urged the Department to focus particular attention on human factors research needs, including: analysis of the causes and prevalence of truck driver loss of alertness ("fatigue") and appropriate countermeasures; assessment of the effectiveness of the commercial driver's license; identification of the traffic information needs of truckers; and analysis of the human factors implications of a proliferation of in-cab driver information devices.