

Review of Needs of Users of Ride Quality Technology

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The primary objectives of this paper are to provide a broad view of the needs of those who use ride quality technology and to propose a possible course of action to fulfill those needs. The quality of vehicle ride can be a significant factor in determining passenger acceptance and use of various modes of public transportation. Technology pertaining to various aspects of ride quality is therefore needed to aid design and operation of vehicles and to achieve acceptance of existing and planned transport vehicle systems. Much of the research in ride quality has been directed toward identifying crew tolerance of acceleration in a military environment. Although this research is pertinent, it has resulted in identification of safety and proficiency levels rather than comfort levels that are needed for evaluation of passenger response in commercial vehicles.

For commercial transportation, ride quality research has tended to be spotty and uncoordinated. Only in the past few years has there been an effort to systematically gain a better understanding of ride quality factors and to build a technology base adequate for designing transport vehicle systems. This effort has concentrated primarily on transport aircraft and has been undertaken primarily by research organizations. To address the question of whether this research is properly focused and broad enough to fulfill needs of research users, a critique of the research activities for better ride quality has been carried out from the viewpoint of the organizations that use the research results.

Needs of users of ride quality technology were assessed by means of both personal interviews and questionnaires. To aid interpretation of results, data collection methods were planned so that sufficient similarity existed between interview and questionnaire. A total of 20 organizations contributed information to this effort. Results indicate that a common basis of terminology is needed for meaningful discussion of ride quality. The different types of criteria in use are discussed, and the

needs for improvements in the ride quality data base are presented. The needs of research users of air, marine, rail, and surface transportation were found to be similar and are presented. A recently developed method, generally applicable to all modes of transportation, was identified for quantifying passenger satisfaction and determining value decisions for existing and conceptual vehicles. Finally, a plan of action is proposed by which the needs of ride quality technology users identified by this study could be fulfilled.

Results of this study show that users of ride quality technology generally perceive technology weaknesses through the ride quality criteria that are subsequently developed. Also, technology results should be standardized so that adequate criteria may be developed. As part of this effort, units and methods of measurement must be standardized. Subjective passenger reaction to vehicle ride must be quantified so that the percent of passengers satisfied can be accurately predicted. Finally, advanced techniques for properly specifying and evaluating disturbance inputs must be developed based on a general method of evaluating passenger satisfaction.

To accomplish these requirements a plan of action has been proposed. The proposed action calls for the establishment of an organization with national responsibility to coordinate, evaluate, and analyze a total effort to quantify passenger satisfaction and value transfer functions for the four transportation modes. Information developed should be provided in a designer's handbook, which would document accepted techniques for both analytical estimate of passenger satisfaction and field measurements for verification of predicted passenger satisfaction.