Many examples of effective liaison between officials and citizens have been described. Nearly all have been the result of individual and very subjective approaches, yet we are being forced into trying to institutionalize what is basically a subjective process. We can learn, and we must educate, for mobility is the lifeblood of any community, and many social scientists apparently have not yet learned this.

Land Use Must Be Controlled

The relationship between transportation and land use is fully accepted, as has been documented for at least 30 years by recorded words, despite some of those newly appearing on the scene believing they brought the concept with them. The relationship has been quantified in tested simulation models, and the travel demands, by modes, can be computer-produced at will. But have the transportation people carried the development of the concept to the point of preparing guidelines or standards by which developers, public or private, can include in their planning sufficient allowance for the transportation that will be needed? One must doubt it.

But the nation grows. Industry comes. People have to live somewhere. Something has to give, and it usually is zoning.

In the considerations of advance acquisition of land, control of development, and related questions, highway officials generally looked not beyond the right-of-way and its very immediate environs. But it is not just within the sight of the highway that the problem arises. It arises from the development in the entire traffic-shed of the highway, and the better the highway, the wider its traffic-shed. Effective development of cities demands effective control over land use. Highway officials led the way in developing highway systems for the economic benefit of the country and brought economists into the field of highway planning. They led the way in urban transportation planning and brought professionals of many disciplines together to form a new breed of planner. In their own interest, if not for that of the nation, perhaps it is time that they took the lead in finding a way to control land use to the maximum benefit of the whole public—not to exercise that control, but to insist that appropriate agencies be created to do it, and do it.

CONCERN FOR HUMAN FACTORS SEEN IN MOST AREAS OF HRB'S MEETING

Henry M. Parsons*

When the Highway Research Board met for the 52nd time in Washington, D. C., in January, interest in human factors extended well beyond the Sixth Annual Human Factors Workshop in Highway Transportation. Of the Board's 64 paper and symposium sessions, 10 were human factors-related: driver licensing, multidisciplinary accident investigation, freeway operations, communications and motorist services, traffic signals, pedestrians, driver characteristics, travel behavior, visibility, and transportation for the disadvantaged.

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*The author is a Consultant in Human Factors, New York, N. Y. His paper is reprinted from the March 1973 issue of Human Factors Society Bulletin.

In addition, of more than 170 technical committees, subcommittees, and task forces that held meetings, a dozen were substantially or fully human factors-oriented: communications, traffic control devices, motorist information systems, visibility, vehicle characteristics, road user characteristics, driver licensing, driver education, driver education curriculum, pedestrians, motorist services, and simulation of the driving task.

Like the paper sessions, the committee meetings mostly involved technical problems and findings. For example, Robert Mackie reported a study of fatigue in long-distance bus and truck drivers, measuring both physiological (e.g., heart rate) and performance (e.g., lane drift) effects. John Snider discussed the concept of the "design driver." Vivek Bhise analyzed vision in merging situations and in a paper session described the eye-marker camera technique in these and other T. H. Rockwell-Ohio State studies. Bicycle riding figured in both the pedestrian committee meeting, chaired by Robert Sleight, and the pedestrian paper session chaired by Slade Hulbert, who also showed a motion picture about his research on bicycle paths in Davis, Calif., a community of 24,000 people with 18,000 bicycles. A session paper by Robert Henderson and Albert Burg described a new device to test driver vision and, hopefully, make such testing meaningful; and a paper by Leonard Evans and Richard Rothery reexamined perceptual thresholds in car-following, recommending as the preferable measure the average relative speed divided by spacing.

There was further evidence that the Highway Research Board is multidisciplinary. Besides the human factors people and, predominantly, the engineers who design roads and traffic systems, planners, economists, lawyers, ecologists, and vehicle engineers discussed urban and mass transportation (bus, rail, and new people-mover systems) and environmental and social factors in 12 of the paper/symposium sessions. A special committee on HRB activities heard a plea for more human factors involvement in these fields and for a new committee on passenger requirements in mass transportation operations—a theme which may also find its way into future Human Factors Workshops.

Like the Fifth Annual Workshop, this year's workshop had five all-day concurrent sessions that attracted more than 100 participants. Gretchen Kolsrud was the workshop chairman.

Particular interest centered on driver education. James McKnight described the new curriculum in HumRRO's program to test whether an optimal driver education course in secondary schools can reduce accident rates. The meticulously specified "Safe Performance Curriculum" includes basic control of longitudinal and lateral motion, normal driving procedures in various roadway and traffic situations, environmental factors (e.g., limited traction or visibility), perceptual skills (in passing, merging, and hazard perception), and special driver influences such as alcohol. The component items come from McKnight's earlier task analysis of driving. In a different approach, current driver education in Iowa is being surveyed through a student questionnaire; its effectiveness will be evaluated through classroom tests, attitude scores, and traffic records, according to Leland Tack. Richard Pain told how a driver improvement program was being developed and evaluated for the Coast Guard.

An American Institutes for Research study described by Harris Shettel has evaluated nine driver training devices according to two dozen functional requirements for each of 27 "training events," which are driving sub-skills synthesized from the HumRRO task analysis. Along a parallel line, a Michigan State program directed by T. W. Forbes has selected 54 subdivisions of "behavioral-environmental-traffic-situational-sequences" in a carefully chosen traffic route to measure in-car driver performance. According to Robert Nolan, these were developed from experts' judgment so that observers could rate both skill in

maneuvering and hazard avoidance; the technique is a research tool, not a licensing device.

Other participants in the session (Richard Bishop, chairman) discussed their work on a curriculum for commercial drivers, a test for selecting bus drivers, certification requirements for driving education teachers, a treatment technique for problem drivers, license renewal examinations, and driving emergency procedures. Lee Malany described the driver education and licensing program of the National Highway Traffic Safety Administration, which has funded much of the work described here. Goldstein directed attention to such needs as identifying the critical errors of new, young drivers, training subsequent to driver education, and skill diagnosis before entering a driver education course.

A workshop session on diagrammatic guide signs chaired by Truman Mast heard Myron Zajkowski on laboratory studies, John Chernisky on instrumented-vehicle studies, and Gretchen Kolsrud on field evaluation studies. Research has been supported or conducted by the Federal Highway Administration, much of it with comparisons of diagrammatic and lettered-only signs at interchanges on the Capital Beltway around the District of Columbia. (Some Beltway drivers, it was noted, make a complete circuit because they miss their turn.) Discussion compared the three types of studies as well as various criteria, such as time required to interpret a sign and traffic indicators—speeds, headways, vehicle distribution, lane placements, changing lanes, and other erratic or hazardous maneuvers. Variables have included exiting versus through travel, left- versus right-hand exits, driver familiarity with the type of sign, sign presentation time, subject loading, and on-road versus in-vehicle sign display.

James Fell, who chaired a session on multidisciplinary accident investigation (MDAI), reported that most of the accidents in an Indiana University study involved driver behavior, and most of these were attributable to perception/comprehension or decision errors. MDAI can provide valuable small-sample, diagnostic data not available through routine accident information and base data, although discussion suggested caution in drawing broad statistical conclusions and in terminology about causal factors and severity of damage. Donald Huelke talked about the effects of vehicle design on injury. In rollovers, the less the roof was crushed, according to an analysis of MDAI reports he cited, the greater the chance of ejection and thereby a much greater likelihood of death; accordingly, legal requirements of vehicle roof strength might bear reexamination.

In the other two sessions—on the overlapping themes of research methodology and traffic safety program evaluation—real-life questions enlivened discussions somewhat reminiscent of graduate seminars in experimental design. For example, Flectcher Platt commented on subject selection procedures in the current evaluation of the Ford Employee Skilled Driver Program, in which 1,052 experienced drivers are being tested and retrained; four groups are getting different degrees and kinds of retraining. Thus, here too the workshop turned to driver education as a major interest. Does it do any good? What should it be?