

Automobile drivers
- Effect of fatigue

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CHANGES IN DRIVER PERFORMANCE WITH TIME IN DRIVING

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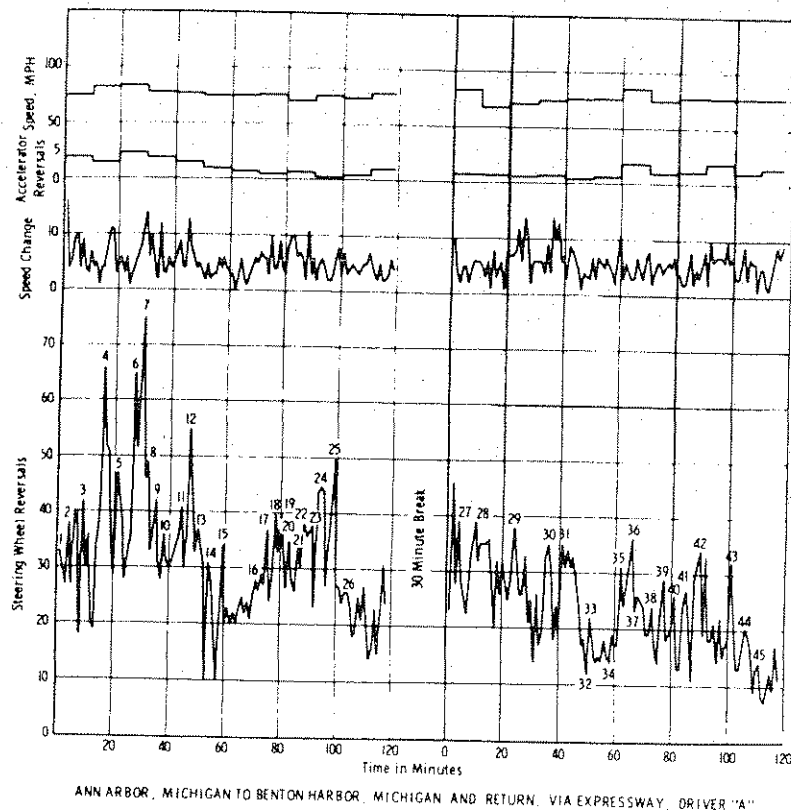
PROCEDURE

It was decided to make the "fatigue" runs on an expressway where the physical features of the road would be practically constant. The drivers were all college students. No attempt was made to make sufficient runs to achieve statistical stability. It was anticipated from the findings of others already referred to that there would be little or no consistency in the times at which drivers would show the effects of driving fatigue.

The data from a number of "runs" or trips will be plotted and analyzed to give an indication of the differences in individual driving behavior. The data will then be summarized in tabular form.

The data for a typical "fatigue" trip are shown graphically in Figure 2. The physical and mental condition of the driving at the beginning of the run could be described as normal. Each driver at the beginning of a trip filled out a questionnaire giving his own estimate of his condition.

Figure 2



Four variables are shown: (1) the speed in miles per hour for each 10 minutes of driving, (2) the number of accelerator reversals per 10-minute interval, (3) the amount of speed change for each one minute interval, and (4) the number of steering wheel reversals for each one minute interval. The number of brake applications was found to be insignificant and was not plotted.

The numbers at the frequency peaks of steering wheel reversals refer to the events that could have caused the fluctuations in the frequency of steering wheel reversals.

List of Events Corresponding to Numbers Shown in Figure 2

- | | |
|--|--|
| 1. Adjusted sun visor and car window. | 28. Gestured. |
| 2. Slowed for car in passing lane. | 29. Driver watched counters. |
| 3. Lit cigarette | 30. Changed back to right foot on accelerator. |
| 4. Used horn - talking. | 31. Put out cigarette. |
| 5. Put out cigarette-slowed for truck. | 32. Noted cross wind. |
| 6. Adjusted heat control | 33. Passed two trucks. |
| 7. Slowed for car in passing lane. | 34. Road repair zone. |
| 8. Gestured. | 35. Driver seems to be over steering. |
| 9. Talked and gestured. | 36. Changed position of hands on steering wheel. |
| 10. Slowed for one lane traffic. | 37. Passing. |
| 11. Adjusted heat control. | 38. Changed position of hands on steering wheel. |
| 12. Adjusted heat control. | 39. Lit cigarette. |
| 13. Ate candy. | 40. Wind from passing truck made car sway. |
| 14. Slowed for truck. | 41. Stretched right foot. |
| 15. Stretched-adjusted heat and vent. | 42. Seemed to be over steering. |
| 16. Adjusted heat controls. | 43. Changing grade. |
| 17. No observed reason | 44. Changing grade. |
| 18. Noted cross winds. | 45. Changed position of hands on steering wheel |
| 19. Changed to left foot for accelerator. | 46. Applied brakes to avoid slow car in passing. |
| 20. Lit cigarette. | 47. Burning car on roadside. |
| 21. Used horn. | 48. Changed hands on steering wheel. |
| 22. Slowed for lane traffic | 49. Again changed hands on steering wheel. |
| 23. Put out cigarette-adjusted heat. | |
| 24. Slowed for truck. | |
| 25. Driver stated he was drowsy-noted cross winds. | |
| 26. Stretched. | |
| 27. Slowed for pedestrian on highway. | |

ANALYSIS OF GRAPH

An examination of Figure 2 reveals that the accelerator reversals per 10 minute period decrease in frequency at about the end of the first hour and then increase at about the end of the third hour.