REFERENCES

- 1. American Association of State Highway Officials Road User Benefit Analysis for Highway Improvements.
 Washington, D. C., 1960 (the Red Book).
- Winfrey, R. <u>Economic Analysis for Highways</u>, Interna tional Textbook Company, 1968.
- 3. De Weille, J. Quantification of Road User Savings. International Bank Staff (Occasional Papers Nº 2). Washington, December 1965.
- 4. Bonney, RSP and Stevens, N. F. Road Research Laboratory Technical Paper Nº 76 - Vehicle Operating Costs of Trucks and Buses on Bitumen, Gravel and Earth Roads in East and Central Africa. HM Stationery Office, London 1967.
- 5. Claffey, P. J. Running Costs of Motor Vehicles as
 Affected by Road Design and Traffic, NCHRP Report 111,
 1971.
- 6. Curry, D. A. and Andersen, D. G. <u>Procedures for Esti-mating Highway User Cost</u>, Air Pollution and Noise Effects, NCHRP Report 133, 1972.
- 7. Lad, G. N. T.; Delaney, D. J.; Fisher, N. W. F.; Thompson; K. E.; Spence, J. A. A Model for the Economic Evaluation of Rural Road Improvements, ARRB Proceedings, Volume 4, Part I (1968).
- 8. Moavenzadeh, F.; Stafford, J. H.; Suhrbier, J. H. and Alexander, J. <u>Highway Design Study Phase I</u>: <u>The Model</u>, International Bank for Reconstruction and Development, Economics Department Working Paper Nº 96. Washington, DC, 1971 (Unpublished).
- 9. Hide, H.; Abaynayaka, S. W.; Sayer, I. and Wyatt, R. The Kenya Road Transport Cost Study: Research on Vehicle
 Operating Costs. Department of the Environment, TRRL
 Report LR 672. Crowthorne 1975 (Transport and Road
 Research Laboratory).
- 10. Hodges, J. W.; Rolt, J. and JOnes, T. E. The Kenya Road Tansport Cost Study: Research on Road Deterioration.

 Department of the Environment, TRRL Report LR 673.

 Crowthorne, 1975 (Transport and Road Research Laboratory).

- 11. Robinson, R.; Hide, H.; Hodges, J. W.; Abaynayaka, S. W. and Rolt, J. A Road Transport Investment Model for Developing Countries. Department of Environment, TRRL Report LR 674, Crowthorne 1975 (Transport and Road Research Laboratory).
- 12. International Bank for Reconstruction and Development Highway Design Standards Study: Phase II Background Summary and Evaluation of TRRL/IBRD Kenya Study, Draft Report, 1975.
- PROJECT DOCUMENT Research on the Interrelationships between Costs of Highway Construction, Maintenance and Utilization, UNDP Project BRA/74/012, UNDP, GEIPOT, IBRD, July 1974.
- 14. Centre Expérimental de Rechèrches et d'Études du Bâtiment et des Travaux Publics Highway Design Study for Brazil Proposed Plan Final Report. Vol. I, II, III, Paris, November 1973.
- 15. International Bank for Reconstruction and Development Research on the Interrelationships between Cost of Highway Construction, Maintenance and Utilization, Proposed Project Plan to the Government of Brazil, BRA/74/012/A/01/42, November 1974.
- Departamento Nacional de Estradas de Rodagem and Serviço Federal de Processamento de Dados Cadastro Nacional de Veiculos e Proprietários CVP, Volumes 1 e 2, 1975.
- 17. "Quatro Rodas", January 1976. Abril Editora Ltda., Brasil.
- 18. "Transporte Moderno", October 1975. Abril Tec-Editora Ltda., Brasil.
- 19. Abaynayaka, S. W.; Howe, J. D.; Jacobs, G. D. and Norosvik, G. A Study of Factors Affecting Traffic Speeds on Rural Roads in Kenya. Department of the Environment, TRRL Supplementary Report 284-C. Crowthorne, 1974.
- 20. Anderson, V. L. and McLean, R. A. <u>Design of Experiments A Realistic Approach</u>. Marcel Dekker, Inc., New York 1974.
- 21. Harreveld, W. Van. <u>Fuel Consumption of Diesel Powered Vehicles on Grades</u>. Netherlands Economic Institute. 50, Burgemeester Oudlaan, NL-3016, Rotterdam.

- 22. "Transporte Moderno," Automobile Magazine, November 1975. Commercial Department of Abril Tec-Editora, São Paulo.
- 23. "Quatro Rodas," Automobile Magazine, October 1975.

 Commercial Department of Abril Tec-Editora, São Paulo,
 Brazil.
- 24. Hudson, W. R. and Finn, F. N. A General Framework for Pavement Rehabilitation. Pavement Rehabilitation: Proceedings of a Workshop. Report Nº FHWA-RD-74-60, Federal Highway Administration, Washington D. C. 1974.
- 25. Hudson, W. R.; Finn, F. N.; McCullough, B. F.; Nair, K. and Vallerga, B. A. Systems Approach to Pavement Design Systems Formulation, Performance Definition and Materials Characterization: Final Report, NCHRP Project 1-10, Materials Research Development, Inc. March 1968.
- 26. Roberts, F. L. and Hudson, W. R. <u>Pavement Serviceabi-lity Equations Using the Surface Dynamics Profilometer</u>.

 Research Report 73-3; Center for Highways Research,
 University of Texas at Austin, April 1970.
- 27. Walker, R. S. and Hudson, W. R. The Use of Spectral Estimates for Pavement Characterization. Research Report 156-2, Center for Highway Research, University of Texas at Austin, August 1973.
- 28. Walker, R. S. and Hudson, W. R. A Correlation Study of the Mays Road Meters with the Surface Dynamics
 Profilometer. Research Report 156-1, Center for Highway Research, University of Texas at Austin, February 1973.
- 29. GEIPOT-TRDF Project Staff Appendix for Project Inception Report Research Concepts and Procedures,

 Project Working Document No. 3, Brasilia, Brazil, April
 1976.

LIST OF TERMS AND ABBREVIATIONS USED IN THE REPORT

- ACAR Associação de Crédito Assistencial Rural (Rural Credit Assistance Association)
- CAEEB Companhia Auxiliar de Empresas Elétricas Brasileiras (Auxiliary Company of Brazilian Electric Firms)
- CAESB Companhia de Água e Esgotos de Brasília (Brasília Water & Sewage Co.)
- COBAL Companhia Brasileira de Alimentos (Brazilian Food Company)
- DER Departamento de Estradas de Rodagem (State Highway Department) Usually followed by the appropriate state abbreviation. Example; DER-MG Highway Department of Minas Gerais
- D M I Distance measuring instrument
- DNER Departamento Nacional de Estradas de Rodagem (National Highway Department)
- DNMET Departamento Nacional de Meteorologia (National Meteorology Department)
- EMBRAPA Empresa Brasileira de Pesquisa Agropecuária (A research unit of the Brazilian Ministry of Agriculture)
- EMBRATEL Empresa Brasileira de Telecomunicações (Brazilian Telecommunications Company)
- E W G Expert Working Group the group of expert consultants who advise the project staff.
- GEIPOT Empresa Brasileira de Planejamento de Transportes (The Brazilian Agency carrying out the research)

- M.I.T. Massachussets Institute of Technology
- N.T.C. Associação Nacional das Empresas de Transportes Rodoviários de Carga (National Highway Freight Transportation Association)
- PESQUISA ICR Pesquisa sobre os Inter-relacionamentos dos Custos Rodoviários (Research on Interrelationships of Highway Costs)
- RJET Remote job entry terminal A terminal that permits someone to use the facilities of a computer center at distance
- SERPRO Serviço Federal de Processamento de Dados (Federal Service of Data Processing)
- SUTEG Superintendência de Transportes e Terminais de Goiás (Goias Passenger Transportation and Terminals Administration)
- TELEBRASILIA Telecomunicações de Brasilia, S.A. (Brasilia Telephone Company)
- Triângulo Mineiro A geographic region covering Uberaba, Uberlândia and Araxa in the state of Minas Gerais
- TRRL Transport & Road Research Laboratory
- T R U Taxa Rodoviária Única (Combined Vehicle Registration Tax)
- UnB Universidade de Brasília (University of Brasilia)
- UNDP United Nations Development Programme

APPENDIX

Because of its length the appendix of this report is being published separately as Project Working Document Number 3, entitled Appendix, Project Inception Report - Research Concepts and Procedures. That working document includes the following appendices for this report and should be referred to when needed (Ref. 29):

Appendix Number

- 1.1 List of Terms and Abbreviations Used In The Report
- 1.2 Statistical Data On Brazil
- 2.1 Summary Curriculum Vitae of Brazilian Senior Project Personnel
- 2.2 Summary Curriculum Vitae of Expatriate Senior Project Personnel
- 3.1 Road Classification System
- 4.1 Free Speed Experimental Design for on-the-Road Vehicles
- 4.2 Free Speed Experimental Design for Test Vehicles
- 4.3 Analysis of Pilot Study for Traffic Experiments on Negative Grades
- 4.4 Operating Speed Experiment
- 4.5 Calibration of Field Data for Capacity and Simulation
- 5.1 The Statistical Design of the Surfaced Road Experiment
- 6.1 Available Hardware and Software







