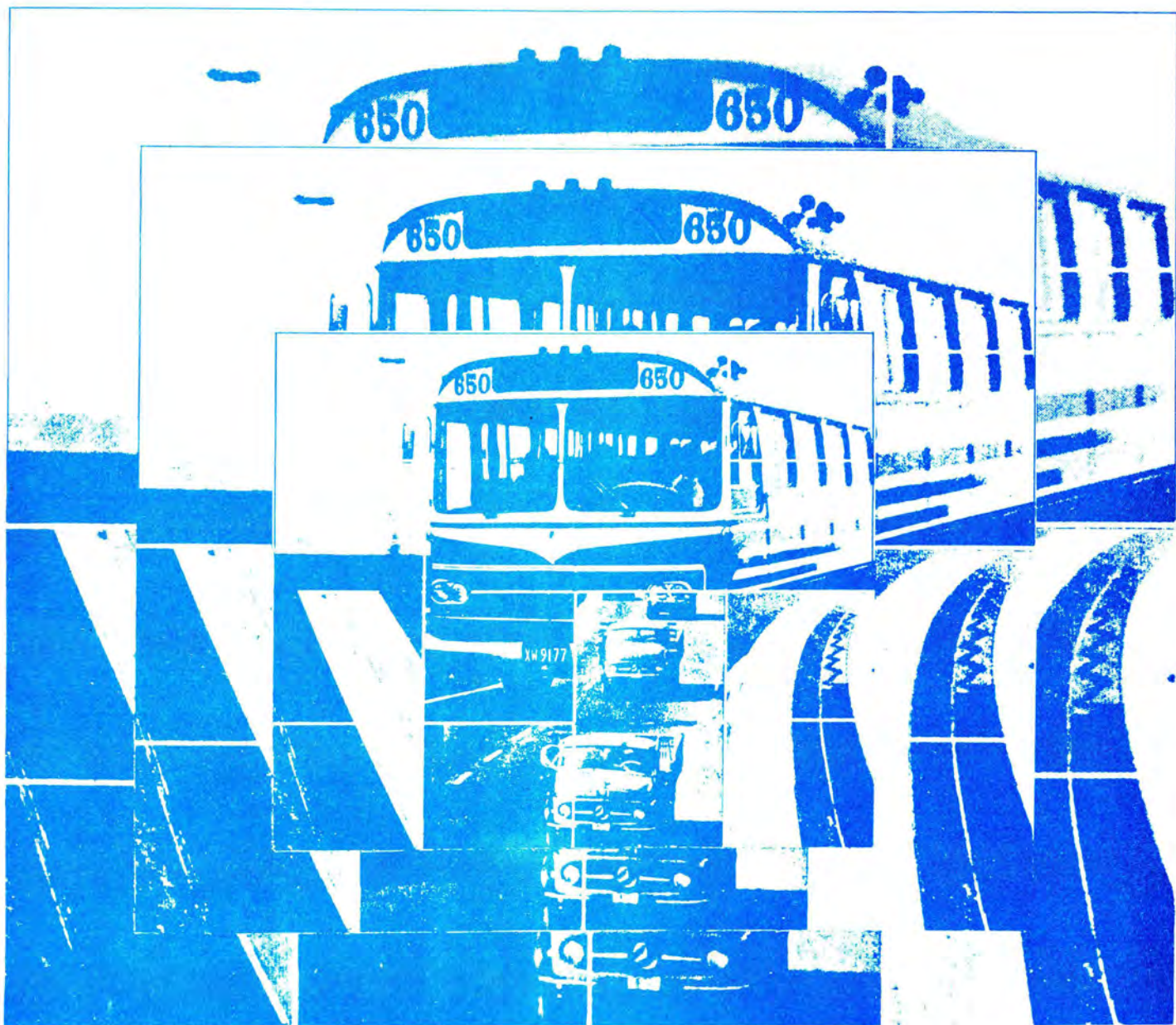


Research on the Interrelationships Between Costs of Highway Construction Maintenance and Utilization



REPÚBLICA FEDERATIVA DO BRASIL

UNITED NATIONS DEVELOPMENT PROGRAM (UNDP)

**Research on the Interrelationships
Between Costs of Highway Construction
Maintenance and Utilization**

SPONSORED BY:

Secretaria de Planejamento da Presidência da República - SEPLAN
Instituto de Pesquisas Econômicas e Sociais - IPEA
International Bank for Reconstruction and Development - IBRD

PREPARED BY:

Ministério dos Transportes
Empresa Brasileira de Planejamento de Transportes - GEIPOT
Texas Research and Development Foundation - TRDF

WITH THE PARTICIPATION OF:

Departamento Nacional de Estradas de Rodagem - DNER
Departamento de Estradas de Rodagem de Goiás
Departamento de Estradas de Rodagem de Minas Gerais

REPORT I - Inception Report - Research Concepts and Procedures - April 1976

PREFACE

This document is the first in a series of reports which will derive from the research project entitled "Research on the Interrelationships between Costs of Highway Construction, Maintenance and Utilization," lately shortened to "Research on the Interrelationships of Highway Costs."

This project is the result of an agreement signed in January 1975 between the Government of Brazil and the United Nations Development Program (UNDP). According to this agreement the Ministry of Transport of Brazil is the Government Cooperating Agency through "Empresa Brasileira de Planejamento de Transportes - GEIPOT," and the International Bank for Reconstruction and Development (IBRD) is the executing agency for UNDP.

GEIPOT is working in close cooperation with the "Departamento Nacional de Estradas de Rodagem" (DNER), through its "Instituto de Pesquisas Rodoviárias" (IPR), and both have received grants from the "Instituto de Planejamento Econômico e Social" (IPEA) and from the "Secretaria de Cooperação Econômica e Técnica Internacional" (SUBIN), respectively.

The IBRD has contracted with the Texas Research and Development Foundation (TRDF) to provide the expatriate staff for the project, which includes professionals on loan from the University of Texas and various other institutions. The expatriate staff includes professionals from the United States of America, Ecuador, Australia, Great-Britain and South Africa.

Previous publications issued since 1969 by IBRD and since 1972 by GEIPOT defining the feasibility of this Research are listed in the bibliographical references. This report is the result of the first six months of research and presents the concepts and methodology to be applied during the following phases of data collection and analysis. Future reports will deal mainly with the partial and final results of the Research as well as with meaningful features of the Research as they occur. All reports will be written and published in Portuguese and in

English. Project offices are in Brasilia, Brazil at GEIPOT headquarters. Authorship of this report is entirely the work of the senior staff of the project, listed elsewhere in this document, and does not at this time imply the approval of or acceptance by any of the sponsors.

As the agency assigned by Brazil's Ministry of Transportation to conduct such an imposing project, which has from its inception attracted international interest, GEIPOT is thankful for the support received from all sponsors as well as from so many other Brazilian and international entities, such as the "Departamento de Estradas de Rodagem de Goiás," the "Transport and Road Research Laboratory" of Great-Britain and the Government of Australia, which are so closely cooperating with the Research, and without which this report and the activities that have preceded it and will follow it would be impossible.

JOSE MENEZES SENNA
President

LIST OF PROJECT PUBLICATIONS

for

Research on the Interrelationships Between
Costs of Highway Construction, Maintenance
and Utilization

REPORT Nº 1, Project Inception Report - Research Concepts and Procedures, April 1976; describes and condenses the project details and presents the overall research approach to be taken in the project.

WORKING DOCUMENT Nº 1, "Project Background Documents for the Expert Working Group," November 1975; describes the beginning of the project activity and the mobilization of the Project Staff.

WORKING DOCUMENT Nº 2, "Summary of Findings EWG Meeting, December 1975;" describes the basic experiments agreed on for further development in the prepilot studies of the project.

WORKING DOCUMENT Nº 3, "Appendix to the Project Inception Report-Research Concepts and Procedures," April 1976; describes material useful for consideration in the project but too detailed for publication in the formal report.

ABSTRACT

A research project is underway in Brazil to develop mathematical models for highway planning. Cost models will be developed relating highway construction, maintenance and utilization. The 42-month project began in September 1975. This initial project report describes the background and previous work in the areas as well as the concepts and proposed methodology for the research.

Three basic activities are proposed and described:

1) a series of road user costs surveys to determine operating costs in Brazil, 2) road user and traffic experiments to relate speed and fuel consumption and 3) pavement performance and maintenance experiments. All of these studies will relate construction, maintenance and utilization costs to road construction and design standards, and pavement performance and maintenance.

Analysis of results will incorporate previous work sponsored by the World Bank and results of a Transportation Road Research Laboratory study in Kenya. The first results of the current study are expected in 1977. The project is sponsored by the Brazilian Ministry of Transport and the United Nations Development Program.

Key words: Highways, highways costs, World Bank, pavement performance, maintenance, vehicle operating costs, user cost, road user cost, speed, fuel consumption, traffic, United Nation Development Program, GEIPOT, Brazil.

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(*) On loan from the Western Australia Government

(**) On loan from Departamento de Estradas de Rodagem de Goiás

TABLE OF CONTENTS

	Page
PREFACE	i
LIST OF PROJECT PUBLICATIONS	iii
ABSTRACT	iv
SENIOR PROJECT STAFF	v
CHAPTER 1 - INTRODUCTION	1
Need for Highway Planning Models	1
Functions Performed by a Highway Cost Model	1
Background	2
Existing Models	3
The Module Concept	4
Input Module	5
Constructions Quantities Module	5
Road Deterioration Module	5
Maintenance Module	5
Vehicle Performance Module	6
Cost Module	6
Output Module	6
Elements Requiring Major Attention	8
Brazilian Model Requirements	8
Secondary Model Requirements	9
CHAPTER 2 - GENERAL STUDY ORGANIZATION	10
Objectives of the Project	10
Scope of the Study	11
Scientific and Analytical Scope	11
Geographical Scope	11
Scope of Application	11
Time Scope	12
Research Approach	12
Research Flow Chart	14
Literature Review	14
Instrumentation and Equipment	16
Research Organization	16

TABLE OF CONTENTS (Cont.)

	Page
The Sponsors	17
Brazilian Staff	17
Expatriate Staff	18
Expert Working Group and Special Consultants	18
Cooperating International Agencies	18
Project Coordination	19
Structure of the Project Staff	19
Professional Disciplines	21
Supporting Staff	22
Functional Organization	22
Road User Costs Surveys	24
Road User Costs and Traffic Experiments	24
Pavement Performance and Maintenance Experiments	24
Support Functions	26
General Work Plan	26
CHAPTER 3 - ROAD USER COSTS SURVEYS	34
Introduction	34
Objectives and Scope	34
Major Costs Elements	38
Vehicle Depreciation	38
Vehicle Maintenance	40
Vertical Geometry	41
Horizontal Curvature	41
Surface Type and Roughness	41
Fuel Consumption	43
Tyres	43
Oil Consumption	44
Other Costs	44
Survey Design and Methodology	45
Background Data Collection Techniques & Sources	46
Consultation - Survey Design Experts	47
Pre-Pilot Studies	50
Pre-Pilot Study Tasks (Oct.1975-Feb.1976)	50
Pilot Studies	51
Pilot Study Tasks (March-June 1976)	51
Preliminary Survey Designs	55
Preliminary Survey Design - Buses	55
Preliminary Survey Design-Trucks, Utility Vehicles, and Cars	56

TABLE OF CONTENTS (Cont.)

	Page
Fleet Size Stratification	63
Direct Contact with Owners	63
Second State Sample	64
Final Sample	64
Sample Design - Discussion of Alternative Sampling Approaches	64
Probability Sample of Vehicles	65
Quota Sample of Vehicles	67
A Mixed Sample	69
Other Considerations	69
Work Plan and Schedule	70
CHAPTER 4 - ROAD USER COSTS AND TRAFFIC EXPERIMENTS	72
Introduction	72
The Speed/Fuel Consumption Model	72
The Experimental Design	76
Project Location	77
Wet vs. Dry Conditions	80
Satellite Study for Gravel Roads	82
Development of Free Speed Prediction Curves	82
Steady State Speeds on Positive Grades	82
Development of the Steady State Speed Prediction Curves	84
Deceleration on Positive Grades	85
Free Speeds in other Geographical Areas	86
Acceleration on Positive Grades	86
Development of the Speed/Length Prediction Curves for Negative Grades	89
Calibration of the Simulation Model for Prediction of Free Speeds	90
Speed/Capacity Relationships	92
Operating Speed Simulation Model	92
Calibration of the Operating Speed Model	93
Field Experiment	93
Data Analysis	94
Development of Fuel Consumption Models	94
Selection of the Test Vehicles	94
Vehicle Instrumentation	100

TABLE OF CONTENTS (Cont.)

	Page
Pre-Pilot and Pilot Studies	121
Pre-Pilot Studies	121
Pilot Studies	122
Extended Study Consideration	123
Investigating the Roughness of Newly Constructed and Overlaid Roads	123
Pavement Rating Scale	124
Interface with Road User Costs Experiments and Surveys	124
Work Plan and Schedule	124
 CHAPTER 6 - SUPPORT ACTIVITIES	 126
Instrumentation	126
Equipment Requirements	126
Calibration	131
Documentation	131
Computer Support Group	131
Computer Requirements for the Project	131
Evaluation of Computer Installations	132
Terminal Facilities	133
Computer Programs	135
Pre-Pilot, Pilot and Full Scale Studies	135
Personnel and Supplies	136
Statistics and Analysis Group	137
Pavement Performance and Maintenance Experiments	137
Road User Costs Experiments (Traffic Studies)	138
Road User Costs Surveys	138
Pavement	138
Traffic	139
Users Survey	142
Work Plan and Schedule	142
 CHAPTER 7 - SUMMARY AND RECOMMENDATIONS	 146
Modified Models	146

TABLE OF CONTENTS (Cont.)

	Page
Application in Brazil	147
General Application Worldwide	147
Flexibility - Updatability	147
Using the Models	147
Data Requirements and Systems Application	148
A Data Generating System Design	148
Sensitivity and Use of the Models	149
Model Verification	149
Model Sensitivity	150
Implementation and Use of the Model	150
Recommendations for Updating	150
REFERENCES	153
LIST OF TERMS AND ABBREVIATIONS USED IN THE REPORT	156
APPENDIX	158

