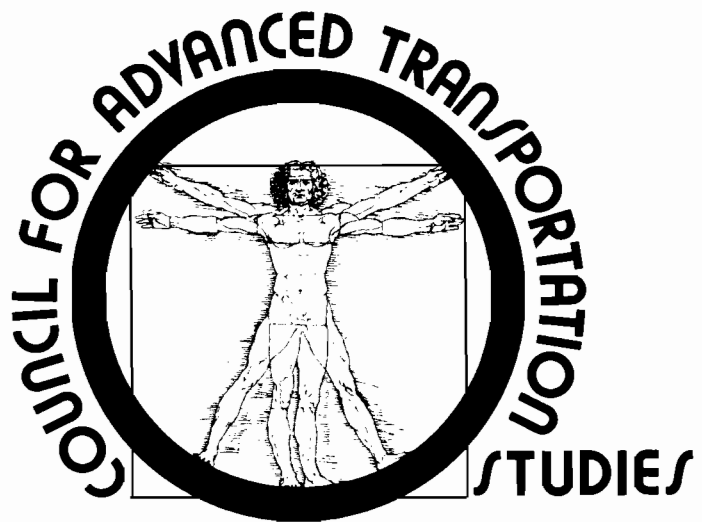


# ANNUAL REPORT THE DIVISION OF RESEARCH IN TRANSPORTATION 1973

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The University of Texas at Austin



## PREFACE

This is the 1973 Annual Report of the Division of Research of the Council for Advanced Transportation Studies. We feel that this past year has been highly successful considering our major task of pulling together a significant multidisciplinary research effort from across our campus.

Research funding for five projects totaling \$400,000 has been obtained this calendar year. These involve 18 faculty, 29 graduate students and staff from 13 disciplines in 10 colleges across the University. Funding for next year is expected to reach \$600,000 based on current or programmed contracts.

The initial success and future potential of this organization is due to the interest, enthusiasm, cooperation and hard work of the key faculty and staff members involved as outlined herein, and to the administrative support of the CATS Executive Committee and other University officials.

*WR Hudson*

W. R. Hudson  
Director



## SELECTED HIGHLIGHTS OF 1973

In any period there are highlights which emphasize the goals, growth, and direction of an organization. Key items in our development this year include:

- \* Receipt of a three-year contract from the Department of Transportation University Research Program in the amount of \$1,500,000 in April 1973. This contract, the largest granted in the program was originally one of 34 selected from over 300 proposals submitted from across the nation.

- \* Hosting a two day conference-workshop entitled, "Transportation to Fulfill Human Needs in the Rural/Urban Environment." The conference attracted over 130 participants from all levels of federal, state, regional and local governments; numerous industries and associations; and other educational institutions. The interaction and exchange of ideas at the conference proved highly successful to the initiation of activities by the multidisciplinary research team.

- \* Receipt in June 1973 of initial funding of \$19,000 from the U.S.

Forest Service for a pilot study of low-cost roads. Continuation for two years to develop a working system analysis is expected.

- \* A two-day briefing session/workshop held in Washington, D.C. by the corresponding principal investigators for the DOT project, and DOT topic monitors and other interested personnel. This interaction at the two-thirds point of the first contract year was highly beneficial to our research team and to the prospects of full renewal (continuation) of our project into the second year.

- \* A one-day joint conference with Texas A&M University to discuss Transportation-Energy related problems in Texas. The importance of the joint interaction was described in a Dallas Morning News Editorial published December 29, 1973 as follows: "The effort by researchers of the two Texas Universities to pool their knowledge and wisdom in certain areas such as transportation is a step in the right direction." "In joining together to find answers to some of the problems stemming from the energy shortage, they can perform an invaluable service to Texas and to the nation."



John L. Hazard, Assistant Secretary for Policy and International Affairs of DOT meets informally following an address to University of Texas faculty, students, and visitors from State and local agencies.

## THE COUNCIL FOR ADVANCED TRANSPORTATION STUDIES

The University of Texas Council for Advanced Transportation Studies (CATS) is a multidisciplinary organization formed to carry out research and educational programs in transportation at The University of Texas at Austin. The program focuses on national, state, and local transportation problems and provides an academic background for the development of professional careers in several fields of transportation. The Council provides a forum for faculty and student participation through close working relationships with industry and government agencies having common goals and interests in transportation education and research.

### DIVISION OF RESEARCH IN TRANSPORTATION

The research division of the Council conducts multidisciplinary transportation research within The University and serves as a link between The University, industry, other universities and all levels of government for interaction on transportation problems. The Division of Research (DORT) maintains awareness of the changing needs of the society by exchanging new transportation ideas with industry and government through meetings, conferences and seminars. A continuous effort is made by DORT to identify new transportation research possibilities for The University community, focusing on specific transportation needs to solve human problems.

The Council for Advanced Transportation Studies, Division of Research has in the past two years developed the largest multidisciplinary Transportation Research activity in the nation funded under the University Research Program, U.S. Department of Transportation. The key to this development has been solid basic experience, knowledge and expertise of our University faculty team, support of the Administration and the involvement of students and faculty in the projects.

### HUMAN NEED

In our DOT transportation project the phrase "human need" is meant to convey the fact that our primary thrust is human response to the transportation of persons and goods.

This thrust can be categorized under three headings:

- (1) human problems and the possible role of transportation in solving them;
- (2) human and environmental problems resulting from the physical presence of transportation systems; and
- (3) planning, decision-making, and the physical design of transportation systems with regard to items 1 and 2.

In the past, transportation priorities have seemed direct and easy to establish. For example, in the 1930's it was important and relatively simple to provide all-weather roads "to get the farmer out of the mud." During the 1940's, defense transportation was top priority. In the 1950's and 1960's the development of the Interstate Highway System, a reliable airline fleet, and similar goals were largely fulfilled.

With this background of accomplishments, we must now turn attention to the more complex and subtle problems related to improving the general quality of American life and the improvement of transportation related thereto. The function of the research outlined herein is to encourage multidisciplinary teams of researchers to attack transportation problems on a broad front. The University of Texas through its Council for Advanced Transportation Studies has a group of 69 faculty members from 25 disciplines in 10 schools and colleges who are interested in these problems.

### STAFFING PLAN

CATS projects are staffed by full-time faculty members and students, with a minimum of non-teaching staff. This is in keeping with the goals and objectives of the University to tie research to academic programs. It also fulfills the desires of the DOT program that the research be academically based. As outlined elsewhere, the project staff will report directly to the Office of the President through the Council's Executive Committee, made up of ten Deans.

The Director of Research for CATS is Dr. W. R. Hudson. Dr. Hudson is a Professor of Civil Engineering with teaching duties in Transportation. He also has administrative experience as Associate Dean of Engineering and as Acting Director for the Center for Highway Research. Dr. Shane Davies,

Geography, has served as Associate Program Director. Dr. Davies is a social scientist with an excellent record of transportation research and administrative experience as former head of the Geography Department.

Other faculty members involved in CATS research projects are:

Dr. C. Michael Walton, Assistant Professor of Civil Engineering-Transportation.

Dr. Ronald Briggs, Assistant Professor of Geography-Social and Behavioral Sciences.

Professor Richard Dodge, Associate Professor of Architecture-Planning,

Dr. Mark Alpert, Associate Professor of Business-Marketing,

Dr. Stanley Arbingast, Professor of Business Administration-Bureau of Business Research,

Dr. Anthony Healey, Associate Professor of Mechanical Engineering-Vehicle Dynamics,

Dr. William J. Dunlay, Assistant Professor of Civil Engineering - Transportation,

Dr. Patricia Burnett, Assistant Professor of Geography,

Professor Robert Means, Professor of Law,

Dr. Wallace Fowler, Associate Professor of Aerospace Engineering, and

Dr. James Fitzsimmons, Assistant Professor of Management.

### RESEARCH ACTIVITIES

The major effort of the Division of Research, Council for Advanced Transportation Studies, for the 1972-73 year has been to successfully initiate a \$1,576,000 research program with the U.S. Department of Transportation. The details of that program are outlined below. In addition to the large DOT contract, smaller efforts are also being conducted including:

- (1) Vehicle Noise Studies - E. L. Hixson, Electrical Engineering,
- (2) A Study of Low-Cost Forest Service Roads - W. R. Hudson, Civil Engineering, B. F. McCullough, Civil Engineering,
- (3) A Campus Transportation Survey—S. Rosenbloom, Community and Regional Planning,
- (4) Dissemination of Information to Increase Use of Austin Mass Transit - Gene Burd, Journalism.

Abstracts of these projects are included herein.

THE THRUST OF THE UNIVERSITY OF TEXAS  
PROPOSAL TO THE DEPARTMENT OF TRANSPORTATION

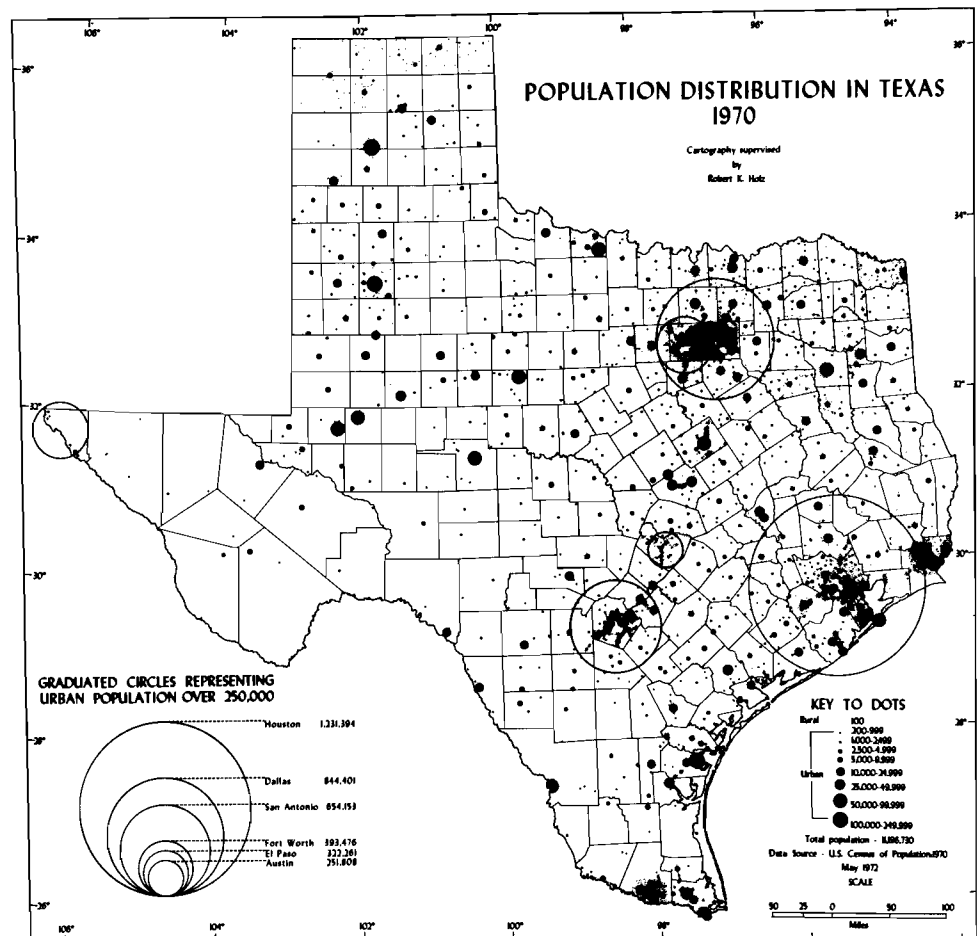
"TRANSPORTATION TO FULFILL HUMAN NEEDS  
IN THE RURAL/URBAN ENVIRONMENT"

Several areas of the United States can be characterized as rural or sparsely populated in which exist large, widely spaced urban centers. Texas for example, has an area of 267,000 square miles, 11 million people and contains 25 Standard Metropolitan Statistical Areas with 6 urban areas exceeding 250,000.

These rural/urban areas include not only the Southwest but portions of the Southeast, Midwest, and Farwest. These regions face not only the typical problems associated with travel in dense urban areas, but also the problems of intra-rural and inter-urban travel. Thus, the importance of a balanced transportation system takes on special significance in such an environment.

Transportation research and development should be directed toward solving human problems. In the past, new technology has sometimes been applied without adequate consideration of human needs. It is now essential that we carefully consider human needs in the development of transportation systems for the 1970's and 1980's, particularly with regard to personal mobility and with regard to the movement of goods and related essential services.

A large, well-directed, multidisciplinary university program can assist with these efforts by bringing together well-balanced, critical-sized multidisciplinary teams of faculty and students to study the problems and to interact with state and local governments and industry in defining and solving them. The training of college graduates in the transportation field is of crucial importance to this issue.



## SUMMARY OF PROPOSED RESEARCH

An intent of this project is to establish a broad basis for continuing interaction and research in transportation with industry and local, state, and federal government agencies. As outlined above, a general theme has been selected for developing a program of research which will help solve long-range problems, while at the same time providing immediate useful results for the sponsors.

The broad objective of the program is to solve problems with the sponsors and cooperating agencies related to human needs and transportation needs in the rural/urban environment as typified by the great Southwest. That is to say that a variety of research can be accomplished keeping in mind the needs of both the urban and the rural traveling public. In this first year of the program, a group of five program objectives, as outlined below, has been attacked for rapid results. These first year results will also provide guidance for the future development of the program.

### ACCESS TO ESSENTIAL SERVICES

The concern here is with the role of transportation in providing accessibility to essential services for the rural and needy populations, both emergency and ongoing. Emergency services include fire and police protection and emergency medical assistance. Ongoing services include education, social and rehabilitation services, and health care.

Inequality in the availability of essential services between rural and urban areas is being studied. The inequality is probably a consequence of the inability of the dispersed rural population to generate a tax base or a demand concentration sufficient to provide a dense network of facilities. However, transportation techniques must be developed to make essential services available to the rural and needy populations.

Existing research is deficient because of its failures to consider the interrelationships of essential services and to recognize the complete interdependencies between the demand for essential services, the demand for transportation, the location of the population, and the location of service facilities. Present

studies have not adequately considered the viability of such innovative approaches as regional service centers or mobile facilities.

During the first year of study, selection was made of the Capital Area Planning Council (CAPCO) region, consisting of the 10 counties surrounding Austin, as representatives of a typical urban/rural region for study of the question of access to essential services. Data has been collected to permit the identification of the present supply system for essential services in CAPCO.

A literature review and bibliography have been completed and are being published as research memoranda. The review synthesizes and evaluates previously published research relevant to improving the accessibility of essential services. Also, completed during the first year, is the conceptual framework for defining essential services and selection of the subset to be considered in the study.

In the second year, alternate systems of supply will be generated and evaluatory capability for determining the viability and relative efficiency of alternate supply systems will be developed using cost-benefit and spatial-allocation models for year three.

### THE INFLUENCE ON THE RURAL ENVIRONMENT OF INTER-URBAN TRANSPORTATION SYSTEMS

It is essential to develop skill in evaluating and perhaps influencing the potential for growth and development of rural communities in order to generate new vitality. This vitality is essential if the flow of residents from rural to urban America is to be checked or reversed.

A review of literature in the field has shown the need for a detailed case study in order to refine a methodology suitable to the special problems of transportation for rural communities. To this end, a single community, Sealy, Texas, was selected for study during the first year.

The result of subsequent year's research will be a planning tool to be used by local, regional and state officials in developing and evaluating proposed intercity transportation systems. This will include testing of the study methodology in two or more selected communities; the evaluation and refinement of this planning tool after implementation. To facilitate implementation the researchers are working closely with an advisory committee comprised of state transportation and planning officials and local governments of selected rural communities.

Data covering a twenty year period has been gathered on land value, land use, business activity, the transportation system, and other economic and social indicators. From an analysis of this data, a preliminary model will be developed and evaluated, and a procedure for future research will be recommended.

Investigators have used a time series approach to develop a perspective of changes within Sealy from 1950 to 1970. This development was divided into three task areas:

- (1) a description of the changing growth and development characteristics of the community,
- (2) a description of the changing operational and physical characteristics of the transportation system, and
- (3) a description of the changing physical and operational characteristics of the connection between a community and the transportation systems.



and monitored.

Phase A of the project is divided into four parts. The first part has included an inventory and evaluation of existing freight transportation facilities, services, and practices in the study area during this first year. The second part is examining the anticipated future changes in the economic geography of the region and their impact on the transportation needs of the area. The third part will identify significant problem areas in providing transportation service in the region with significant study of the Dallas-Fort Worth Regional Airport.

Phase B of the project involves the definition and location of an appropriate data base for the Dallas-Fort Worth area and the development of a plan for collection of any additional data needed. After interaction with the related government agencies and industry, a second and third year's work plan will be formulated.





## EVALUATION OF RIDING QUALITY FACTORS IN MULTIMODAL SYSTEMS

A great deal of information is needed by way of evaluation to determine what the transportation user likes or dislikes about a particular ride or a particular mode of transport. A two-pronged attack on this problem is proposed, as outlined in this and in the subsequent topic.

Improvement of the transportation facilities is necessary for the continued development of any region. A stated goal of the Texas State and Regional Planning Boards is to "develop balanced transportation systems for the regions by combining various modes of travel and technologies for the maximum convenience and efficiency and minimum confusion and congestion in the movement of people and goods."

Movement of people assumes a system to provide safety and convenience with reasonable comfort. In an area such as the Southwest, major centers separated by distances of 200 miles or so are found and travel times with new modes of ground transportation of two hours and more may be expected. A high-quality ride for that time duration is essential if popular use of any system is to be maintained.

The major objectives of the work described are to analyze existing ride quality criteria in use for all modes, to seek a common basis, and to determine if and to what extent a common set of criteria can be used for the dual purposes of guideway and vehicle design. These criteria are to be evaluated in relation to the human attitude responses about ride quality. The common set will then be used in studies of T.A.C.V. and lower speed pneumatic tire vehicle systems so that design criteria may be established for

- (1) pavement or guiding surfaces,
- (2) controlled suspension and steering subsystems, and
- (3) overall system controls.

## HUMAN RESPONSE IN THE EVALUATION OF MODAL CHOICE DECISIONS

This research is an attempt to:

- (1) evaluate the existing modes of transportation available for mixtures of inter and intra (urban

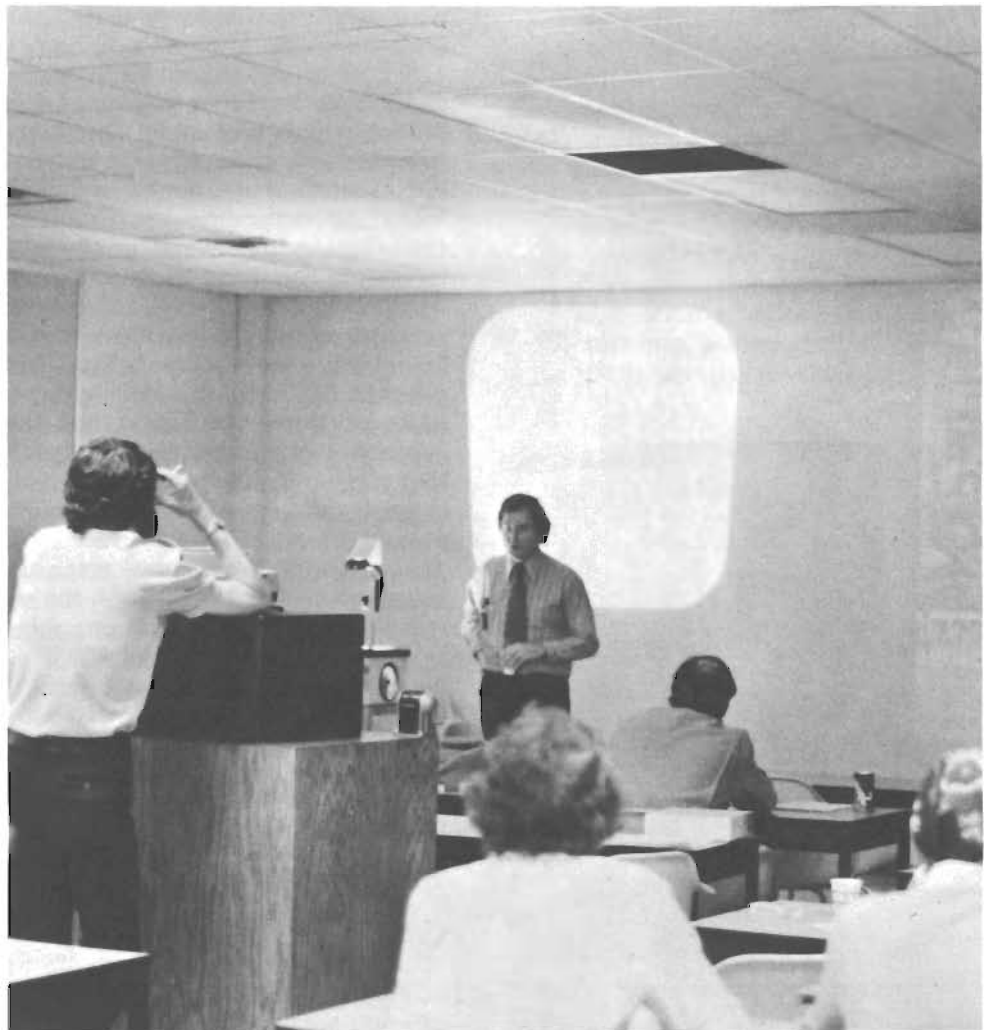
and rural) travel, in terms of perceptions of current users and non-users for each mode;

- (2) recommend ways in which non-users may be attracted to high-density modes through improvement of key elements of the transport systems (comfort, flexibility, etc.) and/or through properly communicating the actual advantages of the modes to potential users;
- (3) evaluate proposed future modes and concepts (specifically the new Dallas-Fort Worth Airport) as to their potential demand for key passenger groups;
- (4) develop a method for evaluating the relative importance of various transportation features attractive to key passenger groups; and
- (5) develop a method for estimating potential users of proposed

transportation modes as well as their usage dates, validate the method by testing anticipated versus actual use of the Dallas-Fort Worth Airport, and indicate those identification criteria which successfully discriminate users from non-users.

The principal methodology being used is magnitude estimation, which requires respondents to give estimates of their perceptions of stimuli in the real world. Other multivariate techniques (multiple regression, discriminant analysis, and factor analysis) will be utilized. Groups studied will include whites, blacks, and chicanos stratified according to social class and stage in the life cycle.

During the first year of the study, a model was developed and preliminary data obtained. Years two and three of the program will involve model testing and subsequent modification and application.



Topic Investigators brief other elements of the project on current research developments through many formal and informal presentations.



## (OTHER STUDIES)

### Project: VEHICLE NOISE STUDIES

Senior Principal Investigator: Elmer Hixson, Electrical Engineering  
Principal Investigator: Doug Reynolds, Architectural Engineering  
Sponsor: Department of Transportation  
Proposed Completion: May 1974  
Funding: \$41,830 for one year  
Patent: Application No. 336,051  
Filed: February 26, 1973  
To be granted: February 1974

It is proposed that a new method of vehicle noise measurement that compensates for microphone - vehicle distance and gives source directivity be used to isolate noise sources and modes of radiation. This information can then be used for developing noise reduction techniques. To determine a better human response model, temporal and statistical properties of vehicle generated noise will be used in addition to the traditional weighted averaged sound pressure levels.

A goal of the subjective reactions study is to develop a response-based model which will allow the determination of an optimal acoustical environment. Field data will be collected to determine the predictive contribution of several engineering indices to the response-based classification model. Thus, the overall product of the study will be a measurement system able to precisely describe both the physical characteristics of transportation noises and subjective psychological reactions to them as well. To do this, semantic differential techniques will be employed in order to develop a classification model of subjective responses to transportation noise. Then the signal parameters which affect subjective responses to the noise will be investigated in laboratory settings. Finally, the relative utility of several acoustical measurement techniques as predictors of the subjective classification model will be determined in field settings.

### Project: A STUDY OF LOW-COST FOREST SERVICE ROADS

Co-Principal Investigators: W. R. Hudson, C.E., B.F. McCullough, C.E.  
Research Assistant: Tom McGarragh  
Sponsor: U.S. Forest Service  
Completion: June 1974  
Funding: \$19,600 for one year (two year extension expected)

The National Forest Service maintains over 200,000 miles of roads throughout the United States. These low volume roads—ranging from narrow, unsurfaced roads to two lane asphalt concrete, paved roads—serve as access roads to recreational and timber land areas. In addition to these, another 136,000 miles of Forest Service roads are planned for construction in future years. Because of the difficulty involved in efficiently designing and maintaining road pavements in such an extensive system, the National Forest Service is sponsoring a research project with the objective of developing and implementing a working pavement design and management system for low-cost roads, in particular Forest Service roads.

The first year of this project is being devoted to the formulation of a preliminary conceptual system. To do this, it is necessary to study the parameters and constraints involved in the problem. Therefore, a comprehensive literature review to gather necessary background material was initiated and is now nearly complete. In addition to this literature review extensive interaction between Forest Service personnel and the project staff has been required, in the form of field visits and project conferences to discuss some of the many complexities of the problem. With the synthesis of information the preliminary conceptual system will be developed.

If after its presentation this conceptual system is accepted by the Forest Service there will be an opportunity to renew the program with Phase 2 of the project - the development of the actual pavement design and management system, including mathematical models and other information that is needed for optimization. This will then be followed by Phase 3 the preparation of training materials and implementation of the design and management system on a trial basis in a selected Forest Service management area.

**Project: THE UNIVERSITY OF TEXAS  
AT AUSTIN: A CAMPUS  
TRANSPORTATION SURVEY**

**Principal Investigator:** Professor Sandra Rosenbloom, C&P

**Research Assistants:** Jane S. Greig, L. S. Ross, Graduate Program, CRP

**Sponsor:** Council for Advanced Transportation Studies

**Completion:** September 1973

**Funding:** \$3,000

This report is the compilation and preliminary analysis of a major campus origin and destination (O-D) study conducted by graduate students in a Community and Regional Planning course in the Spring of 1973. That O-D study was designed to gather basic data on the mobility patterns and trip-making behavior of the UT Austin campus and this report, funded through the Council for Advanced Transportation Studies represents certain initial analyses of campus circulation patterns based on the classification and codification of that sample data.

The data in this report revealed that Wednesday was the peak day for travel to or from the University with peaks in the morning and evening. The highest peak is during the middle of the day — a combination of trips to and from lunch and the scheduling preferences of students. The larger University buildings were the ones most frequented on campus, the Business-Economics Building (BEB), Jester Center, and the Physics-Math-Astronomy Building (PMA) while the area off-campus most popular was a zone bounded by 19th to 24th streets and Guadalupe to Lamar. The popularity of this particular area is due to the dining and retail facilities that cater almost exclusively to the University community.

Pedestrian travel surpassed any other mode on campus. Variations of modal choice definitely exist when the University community is divided into two groups, students and faculty/staff. Although walking was the mode most frequently employed by both groups, the next most popular mode, the automobile, was employed by more faculty and staff than students. Further differences were discovered between the two groups.

**Project: DISSEMINATION OF INFORMATION TO INCREASE USE OF  
AUSTIN MASS TRANSIT**

**Principal Investigator:** Professor Gene Burd, Journalism

**Research Assistants:** Vijay Ganju, Nan Blake

**Sponsor:** Council for Advanced Transportation Studies

**Completion:** September 1973

**Funding:** \$3,000

This report is a study of the relationship of information to mass transit usage of the new Austin, Texas, city buses in the Summer of 1973 in the context of public discussion of an environmental crisis on air pollution and fuel shortages.

It includes a survey of efforts by cities to use information, education and persuasion to increase usage of mass transit; an observation on the traditional coverage of transportation news by mass media; and a brief account of the sparse and recent research on communications and transportation.

Results are reported in the volume of media content; a tally of phone calls to the Customer Service Center and the areas from which they came; and a small sample of neighborhood response revealed in a phone questionnaire, and some comparisons of inter-personal and mass communication.

It was found that the print media was most responsive to promotion of mass transit; that public phone calls to the transit offices increased; that total city bus ridership continued to increase in the study period; but that actually declined in the period, which included vacation-time.

Some recommendations are made on press coverage of transportation news; on general public education and the mass media; on research needs and transit strategies; on possible future projects on communications and transportation and potential support by local agencies and groups; and on ways to improve city bus service in Austin.

**OTHER AREAS OF RESEARCH  
INTEREST**

In addition to the DOT sponsored research, faculty team members have shown significant interest and expertise in a variety of related topics. Some of these will be presented to DOT in other elements of the university program. Others will be funded with local funds or submitted to State or industrial sponsors:

- (1) energy/transportation/environment policy questions with emphasis on the rural/urban environments,
- (2) use of waste materials in the construction of transportation facilities,
- (3) optimum use of natural resources in design and construction of transportation systems,
- (4) a transportation system for a major city/university/capitol metroplex,
- (5) educational aspects of use and effectiveness of public transit systems,
- (6) interior design concepts related to transportation vehicles and terminals,
- (7) analysis of innovative forms of taxi/jitney service for improvement of the transportation system,
- (8) transportation problems of a depressed, primarily agricultural, economic region, and
- (9) meeting transportation needs of the severely disabled.

Dr. Michael Moore of Texas A&M University presenting one of our regular Transportation Seminars to graduate students, faculty, and state agencies.



## COOPERATIVE ACTIVITIES WITH GOVERNMENT, INDUSTRY AND EDUCATIONAL INSTITUTIONS

The Council for Advanced Transportation Studies Division of Research has established a broad base cooperation with a growing number of governmental offices, industries and other educational institutions. Examples of the cooperative activities include: 1) Dr. C. Michael Walton, one of the DOT project principal investigators, serving as a CATS representative on the Governor's Interagency Transportation Council; and 2) the Joint Transportation Coordinating Committee with Texas A&M University which insures better working relationships and less overlap of effort. This latter committee, jointly established by the presidents of the two universities to improve coordination on transportation activities between the universities, has met three times during the year. The committee sponsored a one day workshop on Transportation-Energy on December 17, 1973 at Texas A&M University that was attended by over 20 faculty members of the two universities. A statewide conference on one or more of Texas' transportation activities to be held in the fall 1974 is being planned.

A representative list of governmental agencies, industries and educational institutions that are cooperating in our research activities is given below:

### STATE OF TEXAS COOPERATING AGENCIES

Governor's Office  
Planning and Coordination  
Comprehensive Health Planning  
Rural Development Commission  
Assistant for Educational Affairs  
Information Services  
Health and Human Resources  
Council  
State Health Department  
State Welfare Department  
Texas Department of Public  
Safety  
Texas Aeronautics Commission  
Texas Highway Department  
Texas Railroad Commission  
State Board of Pardons and  
Paroles  
Texas Department of Commu-  
nity Affairs  
Texas Rehabilitation Commission  
State Industrial Commission

## COOPERATING REGIONAL ACTIVITIES

Capital Area Planning Council  
Dallas-Fort Worth Regional Airport  
Board  
North Central Texas Council of  
Governments  
The Council for South Texas Eco-  
nomic Progress

## COOPERATING CITIES - CHAMBERS OF COMMERCE

Dallas Chamber of Commerce  
Fort Worth Chamber of Commerce  
Sealy - City and Businesses  
Austin Chamber of Commerce  
Austin City Planning  
Austin Urban Transportation  
Austin Committee on Transporta-  
tion

## COOPERATING INDUSTRIES

LTV, Ground Transportation Divi-  
sion  
Brown & Root, Inc.  
BRH Mobility Services Company  
Long-Oliver-O'Dwyer Electric, Inc.  
Continental Oil Company  
Engineering Foundation, Industrial  
Associates Program  
AMF Inc.  
Alaska Interstate Inc.  
Airline Pilots Association  
Center for Scientific Urban Plan-  
ning Methods, Inc.  
Rohr Corporation

## COOPERATING EDUCATIONAL INSTITUTIONS

Texas A&M University  
Huston - Tillotson College  
University of Texas at Arlington  
University of Texas at San Antonio  
Medical School

## DISSEMINATION OF INFORMATION

A vital part of any comprehensive research effort is to make the findings available to others for use and education. In this program we are accomplishing this goal by three methods.

- (1) formal project reports and research memos,
- (2) journal and academic publications, and
- (3) oral presentations to national, state, and local groups.

## PROJECT REPORTS AND RESEARCH MEMOS

Two types of project documents have been formalized. The first, Research Memos (RM), are short, direct, interim publications designed to provide rapid access to findings and easy distribution to interested parties. 50 to 250 copies of each RM are distributed to sponsors and cooperating, interested persons. The second types, Research Reports, are more formal, complete documents which cover major research findings of more permanent value. Distribution will range up to 500 copies each. Listed below are Research Memos and Reports which have been produced to date and the tentative titled reports which are expected to be completed during the first year (by 6 April 1974).

### RESEARCH MEMOS

RM 1, "Human Response in the Evaluation of Modal Choice Decisions" Shane Davies, Mark Alpert and Ronald Hudson, April 1973.

RM 2, "Access to Essential Services" Ronald Briggs, Charlotte Clarke, James Fitzsimmons and Paul Jensen, April 1973.

RM 3, "Psychological and Physiological Responses to Stimulation" A.J. Healey, D. W. Woolridge and R. O. Stearman, August 1973.

RM 4, "An Intermodal Transportation System for the Southwest: A Preliminary Proposal" Charles P. Zlatkovich, September 1973.

RM 5, "Passenger Travel Patterns and Mode Selection in Texas: An Evaluation" Shane Davies, Mark Alpert, Harry Wolfe and Rebecca Gonzales, October 1973.

RM 6, "Segmenting a Transportation Market by Determinant Attri-

butes of Modal Choice" Shane Davies and Mark Alpert, October 1973.

RM 7, "The Interstate Rail System: A Proposal" Charles P. Zlatkovich, December 1973.

RM 8, "Literature Survey on Passenger and Seat Modelling for the Evaluation of Ride Quality" Bruce Shanahan, Ronald Stearman and Anthony Healey, November 1973.

RM 9, "The Definition of Essential Services and the Identification of Key Problem Areas" Ronald Briggs, and James Fitzsimmons, January 1974.

RM 10, "A Procedure for Calculating Great Circle Distances Between Geographic Locations" Bryan Adair, Marilyn Turnbull, February 1974.

RM 11, "MAPRINT: Computer Program for Analyzing Changing Locations of Non-residential Activities" Graham Hunter, Richard Dodge, C. Michael Walton, March 1974.

## PROJECT REPORTS

RR III-1, "Inventory and Evaluation of Freight Transportation in the Southwest Part I: Major Users of Transportation in the Dallas-Fort Worth Area" Eugene Robinson, December 1973.

RR III-2, "Inventory and Evaluation of Freight Transportation in the Southwest Part II: Motor Common Carrier Service in the Dallas-Fort Worth Area" J. Bryan Adair and James S. Wilson, December 1973.

RR II-1, "The Influence on the Rural Environment of Interurban Transportation Systems: Methodology and Development" C. Michael Walton and Richard Dodge, January 1974.

RR I-1, "Access to Essential Services: Modeling the Existing System" Ronald Briggs and James Fitzsimmons, (April 1974).

RR IV-1, "An Analysis of Ride Quality Literature" Anthony J. Healey, (April 1974).

RR IV-2, "Vehicle Modelling and Motion Power Spectral Computation for Ride Quality Analysis" Anthony J. Healey and E. Nathman, (April 1974).

RR IV-3, "Measurement of Automobile Motion Spectra Riding over Rough Roadways" R. Bolding, A. J. Healey and R. O. Stearman, (April 1974).

RR V-1, "Passenger Travel Patterns and Mode Selection in the Southwest: An Evaluation" Shane Davies and Mark Alpert, (April 1974).

## JOURNAL PUBLICATIONS AND PRESENTATIONS

The following publications and presentations have resulted totally or in part from project activities.

- (1) "Transportation to Fulfill Human Needs in the Rural/Urban Environment" W. Ronald Hudson and C. Michael Walton, 1974 Automotive Engineering Congress and Exposition, Society of Automotive Engineers, February 1974.
- (2) "A Multidisciplinary Approach to Transportation Education and Research" C. Michael Walton and W. Ronald Hudson, ASCE Conference on Civil Engineering Education, American Society of Civil Engineers, February 1974.
- (3) "Consumer Spatial Behavior and Environmental Structure", Ronald Briggs and David Huff, *Man-Environment Systems*, Fall 1973.
- (4) "Operations Management: Implications of a Service Economy", James A. Fitzsimmons Proceedings of the Fifth Annual AIDS Conference, November 1973.
- (5) "A Model to Relate the Size of the Central Business District to the Population of the City" Ronald Briggs, *Geographic Analysis* (forthcoming).
- (6) "Central Place Theory and the Availability of Essential Goods and Services" Ronald Briggs, submitted to *Economic Geography*.
- (7) "Delineation of Urban Poverty Pockets" Shane Davies, in the *Surveillant Science*, Houghton Mifflin 1973, also forthcoming *Landscape* April 1974.
- (8) "Residential Site Selection and Transportation Access Problems" Shane Davies, *Antipode* forthcoming April 1974.
- (9) "Cultural Change and Economic Development in Coal Mining Areas" Shane Davies, Robin Doughty, Environment Design Research Association (EDRA).
- (10) "Automobile Riding Quality with Real Highway Roughness" A. J. Healey R. O. Stearman and E. Nathman, for the 1974 Joint Automatic Control Conference in June 1974 in an invited session on "Vehicle Dynamics"
- (11) "Transportation Market Segmentation: A Determinant At-

tributes Approach" Mark Alpert, *5th Annual Meeting of the American Institute of Decision Sciences*, Boston, November 1973.

- (12) National Science Foundation funded Transportation Monograph, *The Revenue Commuter Transit Problems of the Disadvantaged*, Annals Association of American Geographers Presentations, Chicago, August 1973 and Seattle, Washington, April 1974, Shane Davies.

#### ORAL PRESENTATIONS

Ronald Briggs, "Access to Essential Services a Conceptualization" an address before the faculty and students at the Public Affairs Program South West Texas State University, April 1973.

James Fitzsimmons, "Innovations in the Provision of Essential Services" a presentation before the Austin Chapter of the National Association of Social Workers, September 1973.

Ronald Briggs, "Models for Planning the Delivery of Health Care to Rural Communities" a talk before the Health Advisory Committee of the Capital Area Planning Council, January 1974.

Charles Zlatkovich, "Freight Transportation in the Southwest" a talk to the members of the Delta Nu Alpha Transportation Fraternity, Fort Worth Chapter, January 1974.

Charles Zlatkovich, "Freight Transportation Recommendations for the Southwest" a talk to the Town and Gown Club, Austin, January 1974.

Charles Zlatkovich, "Inventory and Evaluation of Freight Transportation in the Southwest" a talk at the transportation section of a Census Data User's Conference, Dallas, February 1974.

Shane Davies, South West Social Sciences Meeting, Dallas, April 1974. Participant in Symposium on "Transportation and Poverty".

W. R. Hudson, "Multidisciplinary Research in Transportation" a talk to the Austin Kiwanis, January 1974.

W. D. Badger, Richard Dodge, "The University's Advanced Transportation Studies Program" a part of a panel presentation to WE CARE AUSTIN, January 1974.

#### MANAGEMENT OF THE RESEARCH PROGRAM

A highly effective management system has been developed for the multidisciplinary research of the Council for Advanced Transportation Studies. The system is structured to provide close interaction between project personnel, insuring that each discipline maintains its own identity as it expands on the expertise of the individual study area.

The Council, headed by Dr. L. C. Reese, reports directly to the Executive Vice-President of The University. The Council is governed by an Executive Committee of Deans as follows:

Dr. Lymon C. Reese, Chairman  
Dean Charles M. Burnette, Architecture,  
Dean Wayne Danielson, Communications,  
Acting Dean A. R. Schrank, Natural Sciences,  
Dean Earnest F. Gloyna, Engineering,  
Acting Dean Alexander Clark, Lyndon B. Johnson School of Public Affairs,  
Dean Page Keeton, Law,  
Dean George Kozmetsky, Business Administration,  
Dean J. W. McKie, Social and Behavioral Sciences,  
Dean James R. Roach, General and Comparative Studies,  
Dean Stanley Werbow, Humanities, and  
Dr. W. R. Hudson, Director, Division of Research in Transportation.

Research management is handled through the Division of Research of the Council. Thus, accomplishments of a faculty member in any discipline are quickly recognized by his dean as a member of the Executive Committee and this information, along with the man's teaching and departmental research activities, can be used to justify directly promotions, raises, and other rewards. Therefore, CATS not only provides coordinated control for the research program, but also a close tie for each active researcher to his own Department and Dean.

A Budget Advisory Committee has been appointed by the President of The University to set overall policy for the Division of Research, to ad-

vise the Director of Research and the research group on their activities as needed and to assist the CATS Executive Council coordinating these activities with all phases of The University as required by the multidisciplinary nature of the work. The committee members are:

Dr. Stanley Arbingast, Bureau of Business Research,  
Mr. George R. Blitch, Office of Research Management,  
Dr. C. Shane Davies, Geography  
Dr. W. R. Hudson, Chairman,  
Mr. Hudson Matlock, Civil Engineering,  
Dr. Lymon C. Reese, College of Engineering (Ex Officio), and  
Professor Richard L. Dodge, Architecture (Ex Officio).

### RELATION TO ACADEMIC PROGRAMS IN TRANSPORTATION

Six schools and colleges of The University of Texas at Austin and a number of other divisions have ongoing programs in transportation and in transportation-related fields. Some of these programs have been in existence for many years and have historically cooperated with each other in various research projects. In addition, multidisciplinary graduate programs

in transportation have been available in some of the present graduate degree structures for a number of years.

The academic programs currently available provide all of the elements necessary for the rapid synthesis of truly multidisciplinary formal graduate degree programs in transportation. The Academic Division of the Council for Advanced Transportation Studies, under the leadership of Richard L. Dodge as Acting Director is charged with the task of working out the details for formalizing these programs.

The present curricula provides a firm foundation for the development of multidisciplinary transportation programs and the present faculty have much experience in the teaching of transportation and transportation-related courses.

### POSSIBILITIES FOR INNOVATIVE EDUCATIONAL PROGRAMS

The Introduction of academic training in a cross-disciplinary, public-oriented area such as transportation offers unique opportunities for "new" modes of education. While these methods are not original, they have not been used on a large scale in traditional higher education. We propose to develop innovative educational programs in transportation at The University of Texas at Austin. Exchange programs and

internships are being formulated with the Governor's office and the Department of Transportation.

INTERNSHIPS, EXTERNSHIPS, AND PRACTICUMS. Several major internship programs are currently available at The University of Texas at Austin. These activities usually are connected with disciplines leading to professional practice and sometimes partially satisfy licensing and certification requirements, as well as academic requirements. These will be expanded in transportation.

EXCHANGE PROGRAMS. Much could be gained by using as faculty, employees in transportation-related industry or government on a visiting or temporary basis. Arrangements would be made with outside firms to grant "industrial leaves of absence" for University service. In exchange, University faculty would be encouraged to take leaves of absence for work in industry, as presently done.

MULTIDISCIPLINARY TEAM PROJECTS. This technique is now used by the Lyndon B. Johnson School of Public Affairs. Teams of students from several disciplines work together on a problem in transportation related to some current public need. Supervision by faculty is provided and project duration can be as long as one year.

		•				•		•						•							Low Cost Roads (Forest Service)	OTHER PROJECTS
		•		•				•							•	•				•	Misc. Topics UT Research	
•					•					•					•						Effect of Noise (DOT)	
	•			•													•				Student Trans. (State of Texas)	
				•		•			•	•						•					Modal Choice Evaluation	DOT RESEARCH TOPICS
		•							•								•	•	•		Effect of Interurban Transportation	
						•		•	•	•	•					•					Human Factors and Riding Quality	
		•		•				•	•		•			•		•	•	•			Intermodal Freight/Dallas-Ft. Worth	
•			•	•		•		•	•			•	•				•				Access to Essential Services	
Architectural Engineering	Social Work	Community and Regional Planning	Physical Instruction	Geography	Physics	Sociology	Operations Research	Mechanical Engineering	Civil Engineering	Electrical Engineering	Aerospace Engineering	Public School of Public Affairs	Law	Environmental Engineering	Communication	Marketing	Management	General Business	Architecture	DISCIPLINE		

One of the important aspects of transportation research and the development of students seeking careers in the field of transportation is the opportunity to hear the viewpoints of those now working towards solutions to current transportation questions.

In the recent past we have been privileged to have, as visitors to the university, distinguished guest speakers from industry, all levels of government and other universities.

DATE	SPEAKER	TOPIC			
			Nov. 6, 1972	Capt. Wm. T. Alford, Airline Pilots Association	"The Pilot's Role in the Air Transportation System"
			Nov. 20, 1972	Dr. W. Crawford Dunlap, Chief Scientist, Transportation Systems Center	"Plans and Programs of the Transportation Systems Center"
			Nov. 27, 1972	Dr. Grover Cunningham, President, Evaluation Research Associate	"Social and Psychological Variables As A Part of Technological Planning"
Feb. 15, 1972	Dr. G. W. Cleven, Associate Administrator for Research and Development, Federal Highway Administration, Washington, D.C.	"Integration of Current Highway Research and the Total Transportation Picture"	Feb. 5, 1973	Dr. Ralph C. G. Haas, Prof. of Civil Engineering, University of Waterloo, Visiting Professor of Civil Engineering at UT	"Transportation Planning at the University of Waterloo"
Feb. 22, 1972	Robert L. Lewis, Chief Engineer of Highway Design, Texas Highway Department	"Current Environmental Concerns in Highway Planning and Construction"	Feb. 19, 1973	Mr. Frank Frey, Engineer of Urban Transportation and Mass Transit Planning	"Changes in Emphasis in Highway Planning, Texas Highway Department Action Plan"
Feb. 28, 1972	Milton B. Moisner, Chief, Aviation Policy Division, Federal Aviation Administration, Washington, D.C.	"Airport Capacity"	March 2, 1973	Dr. John L. Hazard, Assistant Secretary for Policy and International Affairs, U.S. Department of Transportation	"National Transportation Problems and Policy Formation"
March 7, 1972	Joe Michie, Former City Manager, Lockhart and Mineral Wells, Texas	"Transportation Problems in a Small City"	March 12, 1973	Dr. Roy Loutzenheiser, Assistant Professor of Civil Engineering, Purdue University	"Reduction of Freeway Congestion by Automatic Detection and Improved Investigation Procedures"
March 20, 1972	Professor Harmer Davis, Institute of Transportation and Traffic Engineering, University of California at Berkeley	"Multidisciplinary Education in Transportation"	April 16, 1973	Mr. Albert P. Rollins, Chairman, Texas Mass Transportation Commission	"Texas Mass Transportation Commission and Projected Activities"
April 7, 1972	The Honorable J.J. "Jake" Pickle, U.S. Congressman - 10th District	"Current Transportation Legislation"	April 23, 1973	Mr. Joe Moseley, Texas Marine Council, Mr. Joe Harris, Division of Planning Coordination, Office of the Governor of Texas	"Texas Supertanker Terminal Seminar"
April 11, 1972	Lloyd King, Ground Transportation, Vought Aeronautics, Grand Prairie, Texas	"High-Speed Ground Transportation Projects at LTV"	Sept. 17, 1973	Mr. Lyndon Henry, Executive Director, Texas Association for Public Transportation	"Cartrans: High Speed Transit for the Capital Area"
April 20, 1972	Professor Emmett H. Karrer, Director, National Highway Institute, U.S. Department of Transportation, Federal Highway Administration	"The National Highway Institute - What it is and What it Can Do for You"	Sept. 24, 1973	Mr. Robert P. Neuschel, McKinsey and Co., Inc. Chicago, Illinois	"Factors Affecting the Establishment of a National Transportation Policy"
April 25, 1972	Joel G. Bates, Managing Partner, Mobility Services Co., Houston, Texas	"The New Generic Transportation Systems and Their Applications"	Nov. 12, 1973	Mr. Joe Ternus, Director of Urban Transportation Department, Austin, Texas	"The City of Austin's New Urban Transportation Department"
May 1, 1972	Dr. Herbert H. Richardson, Chief Scientist, Department of Transportation, Washington, D.C.	"An Overview of Research and Development in the U.S. Department of Transportation, Including the University Role"	Nov. 26, 1973	Dr. Paul Roberts, Center for Transportation Study, Massachusetts Institute of Technology	"Current Transportation Activities at Massachusetts Institute of Technology"
Sept. 18, 1972	Mr. John German, Associate Director, Department of Traffic and Transportation, City of Austin	"Public Transportation in Austin"	Dec. 10, 1973	Dr. Michael Moore, Texas Transportation Institute, Texas A&M University	"Measurements"
Sept. 25, 1972	Mr. John Staha, Transportation Coordinator, Division of Planning and Coordination, Office of the Governor	"The National Transportation Study"			
Oct. 23, 1972	Dr. Brent Rauhut, Research Engineer	"Design of Guideways for High-Speed Tracked Air-Cushion Vehicles"			
Oct. 30, 1972	Mr. Joel Bates, Managing Partner, BRH Mobility Services Co., Houston, Texas	"Texas Medical Center"			

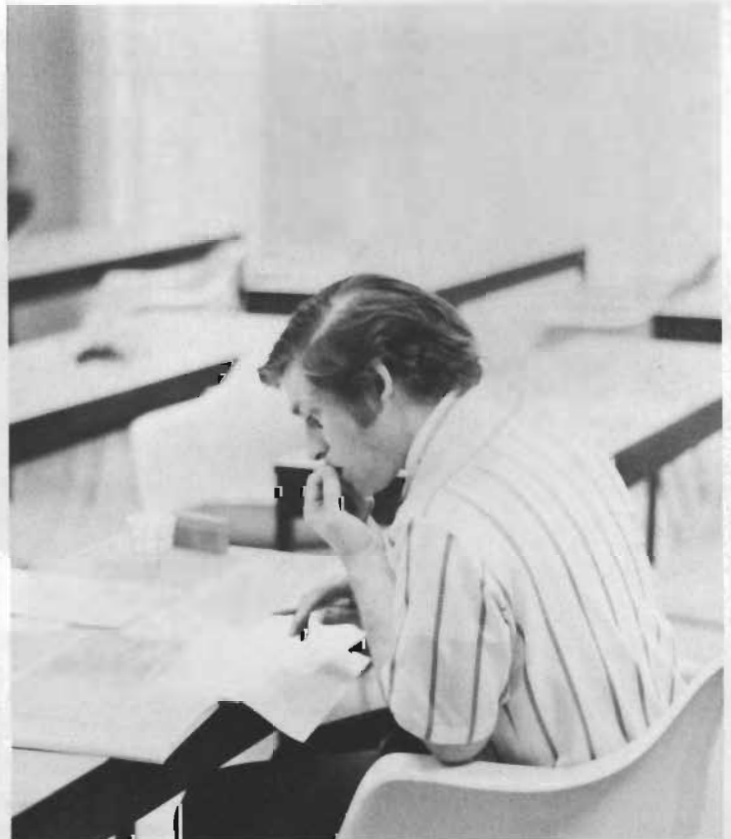


## FACULTY INVOLVEMENT IN CATS-DORT

Faculty involvement in the Council for Advanced Transportation Studies and Division of Research is as follows:

W. R. Hudson, Civil Engineering, Director of Division of Research in Transportation, DORT Budget Advisory Committee (Chairman), CATS Executive Committee (ex officio),  
 Lymon C. Reese, Civil Engineering, CATS Executive Committee (Chairman), DORT Budget Advisory Committee (ex officio),  
 Wayne Danielson, Dean of School of Communications, CATS Executive Committee,  
 Earnest F. Gloyna, Dean of School of Engineering, CATS Executive Committee,  
 Page Keeton, Dean of Law School, CATS Executive Committee,  
 George Kozmetsky, Dean of College of Business Administration, CATS Executive Committee,  
 J. W. McKie, Dean of College of Social and Behavioral Sciences, CATS Executive Committee,  
 James R. Roach, Dean of Division of General and Comparative Studies, CATS Executive Committee,  
 Stanley Werbow, Dean of College of Humanities, CATS Executive Committee,  
 Charles Burnette, Dean of School of Architecture, CATS Executive Committee,  
 A. R. Schrank, Acting Dean of College of Natural Sciences, CATS Executive Committee,  
 C. Shane Davies, Geography, Associate Program Director, Corresponding Principal Investigator, DORT Budget Advisory Committee, DOT Operating Committee,  
 Stanley Arbingast, Bureau of Business Research, DORT Budget Advisory Committee, Corresponding Principal Investigator, DOT Operating Committee,  
 Hudson Matlock, Civil Engineering, DORT Budget Advisory Committee,  
 Richard Dodge, Architecture, DORT Budget Advisory Committee (ex officio), Corresponding Principal Investigator, DOT Operating Committee,  
 Ronald Briggs, Geography, Corresponding Principal Investigator, DOT Operating Committee,  
 Anthony Healey, Mechanical Engineering, Corresponding Principal Investigator DOT Operating Committee,  
 Paul Jensen, Mechanical Engineering, Principal Investigator,  
 James Fitzsimmons, Management, Principal Investigator,  
 Charlotte Clarke, Social Work, Principal Investigator,  
 Henry Steiner, Management, Principal Investigator,  
 Michael Walton, Civil Engineering, Principal Investigator, CATS Executive Secretary, DOT Operating Committee  
 Hampton Snell, Management, Principal Investigator  
 Wallace Fowler, Aerospace Engineering, Principal Investigator, DOT Operating Committee

Robert Means, Law, Principal Investigator,  
 Ronald Stearman, Aerospace Engineering, Principal Investigator  
 Larry Hoberock, Mechanical Engineering, Principal Investigator  
 Mark Alpert, Marketing, Principal Investigator  
 Wade Clifton, Economics, Principal Investigator  
 Stan Burnham, Regional Medical Program, Faculty Associate,  
 Kingley Haynes, Lyndon B. Johnson School of Public Affairs, Faculty Associate,  
 Tom Kennedy, Civil Engineering, DOT Operating Committee, Faculty Associate,  
 Dudley Poston, Sociology, Faculty Associate,  
 John Stockton, Business Statistics, Faculty Associate,  
 Isadore Helburn, Management, Faculty Associate,  
 Robert Helfinstine, Mechanical Engineering, Faculty Associate,  
 Paul Russell, Aerospace Engineering and Engineering Mechanics, Faculty Associate,  
 Sandra Rosenbloom, Community and Regional Planning, Faculty Associate,  
 Stephen Bahr, Sociology, Faculty Associate,  
 Elmer Hixon, Electrical Engineering, Principal Investigator,  
 Franklin McCullough, Civil Engineering, Principal Investigator,  
 Baxter Womack, Electrical Engineering, Faculty Associate,  
 Gene Burd, Journalism, Faculty Associate,  
 Peter Coltman, Architecture and Planning, Faculty Associate,  
 James Holmes, Engineering Graphics, Faculty Associate,  
 George R. Blitch, Office of Research Management,  
 Charles P. Zlatkovich, Bureau of Business Research,  
 Robert Lockwood, Bureau of Business Research, and  
 Florence Escott, Bureau of Business Research.



Topic investigators such as Dr. Tony Healey contribute many hours to transportation research in addition to teaching.

## STUDENTS PARTICIPATING IN TRANSPORTATION RESEARCH ACTIVITIES

The Division of Research has a number of graduate students participating in various aspects of the programs. During the first year there were 36 graduate students from 15 disciplines actively involved in research activities. Many of these students are utilizing research within the DOT project toward theses, dissertations and professional reports, most of whom will complete their respective graduate programs in 1974-75.

These students are:

Joseph B. Adair, M.S., M.E., DOT Topic IIIa, Business,  
Randall M. Bolding, B.S., DOT Topic IV, Aerospace  
Engineering,

David L. Brown, B.S., DOT Topic IIIa, Business,  
Barry A. Chasnoff, B.A., DOT Topic IIIa and V, Law,  
Alfredo J. Dammert, M.S., DOT Topic IIIa, Economics,  
Wayne T. Enders, B.A., DOT Topic I, Geography,  
Graham C. Hunter, A.B., DOT Topic II, Architecture,  
Tom McGarragh, B.S., Forest Service Project, Civil Engin-  
eering,

Edward Nathman, B.S., DOT Topic IV, Mechanical  
Engineering,

Nazim S. Nathoo, B.S., M.S., DOT Topic IV, Mechanical  
Engineering,

Eugene Robinson, B.B.A., DOT Topic IIIa, Marketing,  
Frank Schleicher II, DOT Topic I, Management,  
Shirley Selz, B.A., Forest Service Project, Law,  
Bruce Shanahan, B.S., DOT Topic IV, Aerospace  
Engineering,

Lidvard Skorpa, B.S., DOT Topic II, Civil Engineering,  
James Wilson, B.A., DOT Topic III, Management,

Harry Wolfe, B.A., DOT Topic IIIa and V, Latin American  
Studies and Geography,

Dale Woolridge, B.S., DOT Topic IV, Psychology,

Gerald Little, B.S., DOT Topic IV, Psychology,

Jane Greig, B.A., "Measuring Pedestrian Movement on  
The University of Texas at Austin Campus", Architec-  
ture,

Nan Blake, B.A., "Dissemination of Information to In-  
crease Use of Austin Mass Transit", Photography,

Vijay Ganju, B.A., "Dissemination of Information to  
Increase Use of Austin Mass Transit", Journalism,

Lawrence Ross, B.A., "Measuring Pedestrian Movement  
on The University of Texas Campus", Architecture,

David Venhuizen, B.S., DOT Topic I, Civil Engineering,  
Albert Milhome, B.A., DOT Topic II, Business Adminis-  
tration,

Patricia Poston, DOT Topic I, Social Work,  
Johnce E. Hall, B.S., DOT Topic IV, Mechanical Engineer-  
ing,

Terry Watson, B.A., DOT Topic II, Community and  
Regional Planning,

Mark Goode, B.S., "Measuring Pedestrian Movement on  
The University of Texas Campus", Civil Engineering,

Ron Matthews, M.B.A., DOT Topic I, Business Adminis-  
tration,

Tommy Lee, M.B.A., DOT Topic I, Business Administra-  
tion,

Gordon Derr, B.S.S., DOT Topic II, Civil Engineering,  
David McGeehee, M.S., DOT Topic IV, Mechanical  
Engineering,

William Chipman, B.S.S., DOT Topic III b, Community  
and Regional Planning

Lyndon Henry, B.S.S., DOT Topic IIIb, Community and  
Regional Planning and,

S. Michael Dildine, B.A., DOT Topic IIIa, Business  
Administration.



Graduate students and faculty are provided opportunities throughout the year to hear speakers with differing viewpoints on transportation such as Congressman Jake Pickle discussing the governments' role in transportation problems.

## CLASSIFIED PERSONNEL

There are six full-time and 11 part-time staff members working on the program:

William D. Badger, Jr., Social Science Research Assoc. IV,  
Susan P. Barry, Clerk Typist,  
Franklin C. Bergman, Social Science Research Assoc. III,  
Kristin M. Brown, Laboratory Research Assistant II,  
Steven A. Clyburn, Social Science Research Assistant II,  
Clara O. Chow, Key Punch Operator I,  
Noel Engemon, Social Science Research Associate I,  
Lali A. Ewan, Senior Secretary,  
Rebecca Gonzalez, Senior Secretary,  
John Huddleston, Social Science Research Associate II,  
Donald Luna, Laboratory Research Assistant II,  
Ana Martin, Laboratory Research Assistant II,  
Yolanda Mindieta, Senior Clerk Typist  
Janette Scott, Senior Secretary,  
Diane Thomas, Senior Secretary,  
Mary Lynn Weber, Senior Secretary, and  
James Wilson, Research Associate I.

## COLLEGES AND SCHOOLS ACTIVE IN THE COUNCIL

Architecture and Planning  
Business Administration  
Communication  
Education  
Engineering  
General and Comparative Studies  
Humanities  
Law  
The Lyndon B. Johnson School of Public Affairs  
Natural Sciences  
Social and Behavioral Sciences

## OTHER COOPERATING AGENCIES WITHIN THE UNIVERSITY

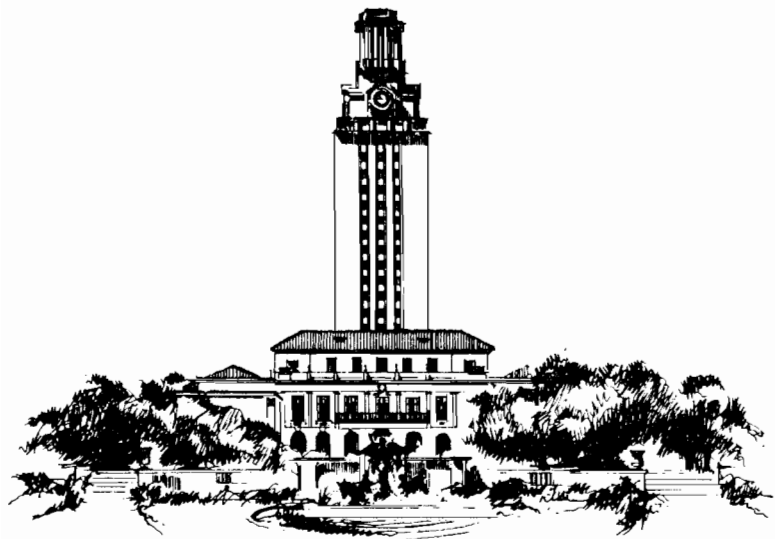
Applied Research Laboratories  
Bureau of Business Research  
Bureau of Economic Geology  
Bureau of Engineering Research  
Center for Highway Research  
Center for Research in Water Resources  
Civil Engineering Structures Research Laboratory  
Center for Communication Research  
Community and Regional Planning Graduate Program  
Computer-Assisted Instruction Laboratory  
Continuing Engineering Studies  
Engineering Mechanics Research Laboratory  
Hydraulic Engineering Group  
Latin American Studies Institute  
Marine Science Institute  
Natural Resources and Environment Division  
Pavements Systems Research Laboratory

## CONTINUING EDUCATION

Short courses, conferences, and seminars focusing on critical problems in transportation will be offered in several areas with emphasis placed on efficient and cost effective implementation of solutions. Short courses and/or seminars concentrating on the application of results of the various research projects will be held when appropriate to present findings for implementation.



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**Council for Advanced Transportation Studies**

**THE UNIVERSITY OF TEXAS AT AUSTIN**