

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-254 802

S.C.R.T.D. LIBRARY

THE CENSUS AND TRANSPORTATION PLANNING
SURVEY OF EVALUATIONS AND RECOMMENDATIONS AS TO
THE USEFULNESS OF THE 1970 CENSUS DATA IN URBAN
TRANSPORTATION PLANNING

VIRGINIA POLYTECHNIC INSTITUTE AND
STATE UNIVERSITY

PREPARED FOR
URBAN MASS TRANSPORTATION
ADMINISTRATION

MARCH 1976

HA
217
.588

BEST SELLERS



FROM NATIONAL TECHNICAL INFORMATION SERVICE

Solar Heating and Cooling in Buildings: Methods of Economic Evaluation

COM-75-11070/PAT 48 p PC\$4.00/MF\$2.25

Design and Construction of a Residential Solar Heating and Cooling System

PB-237 042/PAT 233 p PC\$8.00/MF\$2.25

Performance of a Residential Solar Heating and Cooling System

PB-244 644/PAT 62 p PC\$4.50/MF\$2.25

Solar Energy

AD-778 846/PAT 478 p PC\$12.50/MF\$2.25

Stimulation of Geothermal Energy Resources

ERDA-37/PAT 52 p PC\$4.50/MF\$2.25

An Assessment of Industrial Energy Options Based on Coal and Nuclear Systems

ORNL-4995/PAT 329 p PC\$10.00/MF\$2.25

Environmental Impact Statements: A Handbook for Writers and Reviewers

PB-226 276/PAT 207 p PC\$7.75/MF\$2.25

Environmental Protection Guidelines for Construction Contract Specification Writers

ADA-014146/PAT 124 p PC\$5.50/MF\$2.25

A Review and Analysis of Environmental Impact Assessment Methodologies

ADA-013 359/PAT 21 p PC\$3.50/MF\$2.25

Procedures for Reviewing Environmental Impact Assessments and Statements for Construction Projects

ADA-015 020/PAT 25 p PC\$3.50/MF\$2.25

Computers in the 1980's: Trends in Hardware Technology

AD-783 323/PAT 20 p PC\$3.50/MF\$2.25

Minicomputers: A Review of Current Technology, Systems, and Applications

AD-783 316/PAT 104 p PC\$5.50/MF\$2.25

Microprocessor/Microcomputer Software Systems: Present and Future

ADA-013 322/PAT 25 p PC\$3.50/MF\$2.25

An Air Force Guide to Contracting for Software Acquisition

ADA-020 444/PAT 45 p PC\$4.00/MF\$2.25

A Dictionary for Unit Conversion

PB-249 659/PAT 456 p PC\$17.50/MF Not Available

HOW TO ORDER

When you indicate the method of payment, please note if a purchase order is not accompanied by payment, you will be billed an addition \$5.00 *ship and bill* charge. And please include the card expiration date when using American Express.

Normal delivery time takes three to five weeks. It is vital that you order by number

or your order will be manually filled, incurring a delay. You can opt for *airmail delivery* for a \$2.00 charge per item. Just check the *Airmail Service* box. If you're really pressed for time, call the NTIS Rush Order Service. (703) 557-4700. For a \$10.00 charge per item, your order will be airmailed within 48 hours. Or, you can pick up your order in the Washington Information Center & Bookstore or at our Springfield Operations Center within 24 hours for a \$6.00 per item charge.

You may also place your order by telephone or TELEX. The order desk number is (703) 557-4650 and the TELEX number is 89-9405.

Whenever a foreign sales price is NOT specified in the listings, all foreign buyers must add the following charges to each order: \$2.50 for each paper copy; \$1.50 for each microfiche; and \$10.00 for each Published Search.

Thank you for your interest in NTIS. We appreciate your order.

METHOD OF PAYMENT

- Charge my NTIS deposit account no. _____
 Purchase order no. _____
 Check enclosed for \$ _____
 Charge to my American Express Card account number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Card expiration date _____

Signature _____

- Airmail Services requested

Clip and mail to:

NTIS

National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, Va. 22161
(703) 557-4650 TELEX 89-9405

NAME _____

ADDRESS _____

CITY, STATE, ZIP _____

Item Number	Quantity		Unit Price*	Total Price ^o
	Paper Copy (PC)	Microfiche (MF)		
Sub Total				
Additional Charge				
Enter Grand Total				

* All Prices Subject to Change
10/76

Sub Total
Additional Charge
Enter Grand Total

S.C.R.T.D. LIBRARY
PB 254 802

THE CENSUS AND TRANSPORTATION PLANNING
SURVEY OF EVALUATIONS AND RECOMMENDATIONS
AS TO THE USEFULNESS OF THE
1970 CENSUS DATA
IN URBAN TRANSPORTATION PLANNING

S.C.R.T.D. LIBRARY

Robert C. Stuart and Michael R. Hauck



S.C.R.T.D. LIBRARY

March, 1976
Final Report

Document is available to the public through the
National Technical Information Service,
Springfield, Virginia 22151

Prepared for

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON, D.C. 20590

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

00727

HA
217
.988

1. Report No. UMTA-VA-11-0003-76-1		2. Government Accession No.		3. Recipient's Catalog No. PB254802	
4. Title and Subtitle THE CENSUS AND TRANSPORTATION PLANNING: Survey of Evaluations and Recommendations as to the Usefulness of 1970 Census Data in Urban Transportation Planning				5. Report Date January 1976	
				6. Performing Organization Code 105-303772	
7. Author(s) Robert C. Stuart and Michael Hauck				8. Performing Organization Report No.	
9. Performing Organization Name and Address Virginia Polytechnic Instit. & State Univ. Center for Urb. and Regional Studies EUS Building Blacksburg, Virginia 24061				10. Work Unit No. (TRAIS) VA-11-0003	
				11. Contract or Grant No. VA-11-0003	
12. Sponsoring Agency Name and Address U.S. Department of Transportation Urban Mass Transportation Administration 2100 2nd Street, S.W. Washington, D.C. 20590				13. Type of Report and Period Covered University Research	
				14. Sponsoring Agency Code	
15. Supplementary Notes					
16. Abstract The Urban Transportation Planning Package (UTPP), a special product of the 1970 Census designed cooperatively by FHWA and the Bureau of the Census especially for transportation planning has undergone a series of criticism and evaluations. In addition, the utility of Census data in general has recently come under closer scrutiny by transportation planners. The purpose of this project is to evaluate the usefulness of 1970 Census data for urban transportation planning with special emphasis placed on evaluating the 1970 UTPP. The project seeks to: 1) identify urban transportation planning-related data from the 1970 Census; 2) evaluate the uses of those data in urban transportation planning; 3) identify user problems; 4) identify alternative sources of these data products; and 5) develop a series of recommendations for the 1980 Census. Personal and telephone interviews with ten state, and twenty-five sub-state regional agencies and three university and private consultants were used to generate the desired information. The experiences and opinions of the interviewees were compiled and summarized into a series of recommendations for the 1980 Census. Recommendations of the Contractor are also included.					
PRICES SUBJECT TO CHANGE					
17. Key Words Census Transportation Planning Information systems and Employment			18. Distribution Statement Document is available to the public through the National Technical Information Service, Springfield, Va. 22151		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified			

PREFACE

This report summarizes the findings of a research effort conducted by the Center for Urban and Regional Studies of Virginia Polytechnic Institute and State University, Blacksburg, Virginia, for the joint sponsors Federal Highway Administration/Urban Mass Transportation Administration (contract VA-11-0003). The purpose of this project as set by FHWA/UMTA, is to evaluate the usefulness of 1970 Census data for urban transportation planning. Particular emphasis is placed on evaluating the 1970 Urban Transportation Planning Package (UTPP), a special Census product developed specifically for urban transportation planners.

The specific objectives of this project are: (1) to identify urban transportation planning - related products of the 1970 Census; (2) to evaluate the usefulness of 1970 Census data for urban transportation planning by means of personal and telephone interviews with transportation planners; (3) to identify, through interviewee responses, the types of Census data used, purpose for using these data, user problems, alternative data to Census data for urban transportation planning and user recommendations for modification of the Census; and (4) to develop a series of recommendations based on the interviewee responses.

Outline of Report

This Final Report is divided into three chapters plus a set of appendixes. Chapter I, Introduction, deals with relevant background information concerning the uses and evaluation of Census data and recommendations for the 1980 Census made prior to the initiation of this project. Chapter II, Findings, consists of a synthesis of the interview responses. The text identifies particular agencies that illustrate the points summarized. Chapter III, Conclusions and Recommendations, contains the research team's comment and suggested recommendations for the 1980 Census. The appendixes are as follows:

- A. Contents of Urban Transportation Planning Package (UTPP)
- B. List of Agency Key Persons and Addresses
- C. Bibliography

TABLE OF CONTENTS

Technical Report Documentation Page	i
Preface	ii
Table of Contents	iii
List of Tables	iv
I. INTRODUCTION	1
A. Outline of Report	1
B. Background	1
C. Purpose and Methodology of Present Study	4
II. FINDINGS	5
A. Transportation Related Products of the 1970 Census	5
B. Agency Experience with the UTPP	7
C. Issues Regarding Other Aspects of the Census	21
D. Modeling Trends and Data Requirements	23
E. Agency Recommendations	28
III. CONTRACTOR'S COMMENTS AND RECOMMENDATIONS	31
A. Place of Work/Journey to Work	31
B. Address Coding Guide	32
C. Standard Package	33
D. Vehicle Availability	33
E. User Competencies	33
IV. APPENDICES	
A. Contents of Urban Transportation Planning Package (UTPP)	34
B. List of Agencies Key Persons and Addresses	36
C. Bibliography	43

LIST OF TABLES

1. Agencies Interviewed by Purchasers and Non-Purchasers of UTPP	8
2. Frequency of Use of the Standard Package by Purchasers	9
3. UTPP Used by Extensive and Occasional Users	10
4. Accuracy and Precision of Data	14
5. Geographic Coverage	16
6. Should There Be a POW/JTW in 1980?	20
7. Prospects for Extensive Primary Collection	28

I. INTRODUCTION

A. Background

As required by the Federal Aid Highway Act of 1962, urban areas with populations of 50,000 or more must engage in an approved program of "continuing, comprehensive transportation planning" to be eligible for Federal financial assistance.¹ To successfully accomplish this task, transportation planning agencies must collect, and maintain in current accuracy a voluminous mass of data. As outlined in the Federal Highway Program Manual and the UMTA External Operating Manual, transportation planning agencies must provide inventories and analyses on a wide range of factors affecting the local environment including: economic factors, population, land use, travel patterns, social and community value factors, and transportation facilities.²

The data is essential for identifying and diagnosing transportation problems, forecasting future demand for travel, locating and designing facilities and the range of other functions required in planning, constructing, operating, maintaining and managing an urban transportation system.

Maintaining such a data base has proved to be an expensive and time consuming operation of the transportation planning process. Detailed socio-economic characteristics at the work site, travel data and socio-economic characteristics of the trip maker, land-use and transportation facilities inventories, and many small geographic detail socio-economic characteristics were generated through primary collection (home interview, roadside interview, ground counts, land use survey, employer survey, etc.). Census data was used, for the most part, to provide information on population, general socio-economic characteristics at the home site, general demographic and economic activity data for the metropolitan region and much of the housing data.³

¹United States Code, Title 42.

²Highway Planning Program Manual; "Operations Plans in "Continuing" Urban Transportation Planning", IM Series 50-4-68, (U.S. DOT, FHWA: Washington, DC), April, 1968.

³Creighton, Hamburg Planning Consultants; Data Requirements in Metropolitan Transportation Planning, National Cooperation Highway Research Program Report 120, (Washington, DC) 1971.

With the recent relative decline in state and Federal spending for transportation planning and transportation systems implementation, many transportation planners feel that most of the traditional primary collections will be too expensive on a continuing basis.* Thus, transportation planners are looking for alternative sources for the data normally generated through primary collection. Consequently, there has been investigation and increasing utilization of the regular surveys, records and reports of local, state, and Federal governmental agencies. To this end, FHWA and UMTA have been exploring the potential of expanding the role of the decennial U.S. Census as a major data input for urban transportation planning.

As early as 1965, FHWA (then the Bureau of Public Roads), in cooperation with the Bureau of the Census initiated a continuing effort to make the 1970 Census a more effective and functional data product for urban transportation planning. The major result of these efforts was the 1970 Urban Transportation Planning Package (UTPP), also known as the Standard Package of Census Data for Urban Transportation Studies, developed jointly by FHWA and the Bureau of the Census. The package was intended to supply important data to supplement existing local planning data and to minimize or replace the use of expensive data sources, such as the traditional home interview survey, currently in use. The Standard Package contained home-end socio-economic characteristics by traffic analysis zone (TAZ) and urban area summaries, place of work data by TAZ, and zone-to-zone journey to work data. (For a detailed description of the contents of the Standard Package, see Appendix A.)

In an effort to evaluate the usefulness of the Standard Package, the Committee on Transportation Information Systems and Data Requirements of the Transportation Research Board (TRB) sponsored a conference in Albuquerque, New Mexico, in August, 1973, to discuss the problems, prospects and experiences of the 1970 Standard Package. In addition, determine if the agencies were satisfied with the package; what problems, if any, they had; and what changes, if any, they would like to see in the package.

The results of both the questionnaire and conference demonstrated that the package had not met the expectations of FHWA and state and local planning officials. Criticisms and recommendations varied widely, however, several major topics emerged repeatedly. These included:⁴

*Some transportation planners, however, disagree and consider a decennial O-D survey a must, as noted in Chapter II.

⁴Transportation Research Board, "Census Data and Urban Transportation Planning (Report of a Conference held August 21-23, 1973)," Special Report 145, (Washington, DC) 1974.

Criticisms:

1. Accuracy. Many agencies noted highly inaccurate work trip, employment by zone of work and population by zone of residence data. These errors were partly due to incorrect geocoding, while some agencies laid the blame on too small a sample size.
2. Geocoding. This was the most heavily criticized subject of the Standard Package. Many agencies found a substantial portion of work trips incorrectly coded and as much as 35-50 percent of the work trips uncoded. Also, work trips to outlying areas of the SMSA were coded to Universal Area Code (UAC) and work trips to ambiguous addresses were coded to ZIP codes. Many agencies found that information coded in this fashion was useless since UAC's were too aggregated a level for trip generation, traffic assignment and other types of detailed transportation analysis and the geographic coverage of ZIP codes was uncertain and variable.

Work trip data (Part IV) was not the only part affected by coding problems. Most agencies which criticized the coding of Part IV also noted coding problems and inaccuracies in Parts I and III.

3. Greater Area Coverage. Most agencies registered a complaint concerning the lack of sufficient area coverage of data by traffic zone, the majority of the complaints suggesting full SMSA coverage. This problem of area coverage is related to the problems of geocoding.
4. Tape documentation. A number of agencies commented on the lack of adequate technical documentation concerning data positions on the tape and the labeling and formatting of the tables.

Recommendations:

1. Geocoding. It was recommended that local agencies should be given the option to assist Census in coding trip ends to ensure greater accuracy. Local agencies should also be given the option to recode trip ends coded to UAC, ZIP, or dummy codes (outside SMSA).
2. Additional data items and format of data items. Most agencies made suggestions of additional data items that should be included in the Standard Package. These items ranged from inclusion of bicycles in the mode of travel to socio-economic characteristics and work trip data on commuters. Also, many agencies noted a desire for more cross tabulations of data already contained in the Standard Package. These suggestions included cross tabulation of various socio-economic data of Part I with work trip data of Part IV, as well as more cross tabulations of

other socio-economic data, such as income by auto ownership, household size by auto ownership, etc., for traffic zones.

3. Greater Flexibility of Journey-to-work files. This recommendation grew out of the experiences of the Tri-State agency with the "worker file" developed jointly by Tri-State and Census.

B. Purpose and Methodology of the Present Study

The purposes of the present study built upon the results of these previous efforts in several ways, as follows: First, expand the information derived from the FHWA questionnaire and the Albuquerque Conference. Both conference and questionnaire took place soon after the Standard Package was completed and delivered to a majority of the purchasers and, therefore, entailed rather limited experiences with the Standard Package. The present study was able to solicit opinions and recommendations from more experienced users.

Second, both conference and questionnaire concentrated on uses of the Standard Package while the present study, though emphasizing the Standard Package, is concerned with the utility of Census data in general for transportation and urban planning.

Third, although some discussions and recommendations from the questionnaire and conference concerning additional data items were fairly specific, many questions were left unresolved. Thus, the present study has attempted to generate operational recommendations for the 1980 Census.

And finally, looking towards the decade of the 1980's, this study will also focus on the future data demands of the transportation planning process. New transportation issues and modeling techniques to address these issues are emerging. This study looks to these emerging trends and the data requirements of the new technique.

To gain the greater specificity and detail of responses to study topics that is necessary, personal interviews, rather than mail-back questionnaires, were used.⁵ Thirty-three (33) case studies were developed based on interviews with thirty-nine (39) agencies. The latter included ten (10) state transportation, highway or comprehensive planning agencies, twenty-five (25) sub-state regional planning agencies, councils of government or other metropolitan planning organizations (MPO's), three (3) universities or consultants on contract and one office of the chief executive. Major topics probed in the interviews included: How the Standard Package was used, how long it was useful, problems concerning data format of the package, data requirements (both particular items and format) of the agencies and the sources used to collect the necessary data.

II. FINDINGS

Chapter II summarizes the results of the interviews with 32 urban transportation agencies. This Chapter has five sections:

- A. The transportation related products of the 1970 Census
- B. Agency experience with and attitudes toward the UTPP
- C. Agency experience and attitudes concerning other aspects of the Census
- D. Agency modeling trends and data requirements
- E. Agency recommendations for the 1980 Census.

A. Transportation-Related Products of the 1970 Census

Agencies were asked to list data sources, including Census data items used. Using their responses, Census data items were classified as to frequency of use, with the following results:⁶

1. Census Items Most Frequently Used

Population and Household Data by block, tract, enumeration, district, etc.
Age and sex
Race
Income
Auto ownership
Occupation industry and class of worker
Place of work
Mode of journey to work
Mexican or Spanish Origin
Number of units at address
Value
Contract rent

2. Items Frequently Used

Vacancy status
Employment status
Hours worked last week

⁶The frequency of use of Census items as reported by agencies, has been combined with items listed in a letter to George Hall, Chairman, Federal Agency Council on the 1980 Census from James J. McDonnell, FHWA Representative on the Federal Agency Council on the 1980 Census, dated January 15, 1975. Despite the slightly different classification of frequency of use, the present survey appears to generally confirm the frequency reported in Mr. McDonnell's letter.

Place of residence 5 years ago
Tenure
Second home
Disability presence and duration

3. Items Occasionally Used

Marital status
State or county of birth
Years of school completed
Number of children ever born
Activity 5 years ago
Weeks worked last year
Last year in which worked
Country of birth of parents
Mother tongue
Year moved into this house
School or college enrollment
Veteran status
Access to unit
Kitchen facilities
Rooms
Flush toilet
Bathroom or shower
Basement
Months vacant
Heating
Components of gross rent
Year structure built
Number of units in structure/or trailer
Farm residence
Water source
Sewerage disposal
Bathrooms
Number of stories/elevator
Fuel
Bedrooms
Air conditioning

4. Items Seldom or Not Used

Citizenship
Year of immigration
Marital history
Vocational training
Occupation-industry 5 years ago
Commercial establishment on property
Clothes washing machine
Clothes dryer
Dishwasher
Home food freezer
Television
Radio

B. Agency Experience with the UTPP

Overview

The majority of agencies interviewed had intended to utilize all four parts of the Standard Package extensively for a variety of transportation and comprehensive planning studies. Most agencies which actually purchased the Package evaluated their experiences in using the Package, and the overall quality of the Package, as favorable. The major exceptions were those agencies who had anticipated extensive use of Parts III and IV. These agencies evaluated their experiences and the Package as quite unfavorable. The problems experienced in connection with Parts III and IV were, for the most part, the decisive factor in nonpurchasing agencies' decisions not to acquire the Package.

A number of agencies, particularly non-purchasers and those with unfavorable evaluations, noted that the main utility of the Standard Package was in the employment distribution and work trip data of Parts III and IV, respectively. Housing, demographic and socio-economic data as contained in Parts I and II of the package was directly or indirectly available on the first, second, third, fourth and fifth count Census tapes, normally purchased and used by the agencies.

In sum, the main thrust of criticism and unfavorable evaluation of the Standard Package was directed towards Parts III and IV.

1. Frequency of Use by Purchasers

The Project interviewed the localities or states shown on Table 1. Some of these case studies required interviews with more than one agency. Of the localities or states, 26 (78 percent) were purchasers of the UTPP, 7 (22 percent) were not (Table 1).

Among Package purchasers, the frequency of use of Package data varied from "extensive" to "never" (Table 2). Ninety-five (95) percent of the agencies reported "extensive" or "occasional" use. Of these, 84% were users of Parts I and II and 53% of Parts III and IV (including the agencies reporting use of "all parts"). (Table 3)

It is important to note that a number of agencies reporting intermittent or no use of Parts III or IV had only recently received their tapes or are still reworking the files - allocating uncodable work trips to traffic zones. The majority of these agencies anticipate frequent or extensive use of Parts III and IV as they become available. Notable agencies in this category are Tri-State, San Francisco Metropolitan Transportation Commission and Massachusetts DOT.

Table 1. Agencies Interviewed by Purchasers and Non-Purchasers of UTPP

Purchasers	Non-Purchasers
1. Akron: AMATS ⁷	1. Denver: DRCOG
2. Albuquerque: Middle Rio Grande COG	2. Houston: H-GRTS
3. Baltimore RPC ⁷	3. Kansas City: Mid-America Regional Council
4. Buffalo: NFTC	4. Milwaukee: SEWPC
5. Calif. CALTRANS	5. Penn DOT
6. Colorado DOH	6. Seattle: Puget Sound GC ⁴
7. Chicago: CATS	7. Washington COG ⁴
8. Georgia DOT	
9. Maryland DOT	
10. Massachusetts DPW ³	
11. Little Rock: Metroplan	
12. Miami: Metropolitan Dade Co.	
13. Minneapolis - St. Paul: Metropolitan Council	
14. NY, NJ, Ct.: Tri-State ²	
15. NYS. DOT	
16. Ohio DOT	
17. Philadelphia: DVRPC	
18. Phoenix: Maricopa Association of Governments	
19. Portland: CRAG	
20. Rhode Island: Statewide Planning ⁵	
21. San Diego: CPO ⁷	
22. San Francisco: MTC ^{6,7}	
23. Spokand: SMATS	
24. St. Louis: EWGCC	
25. Texas: SDHPT	
26. St. Louis: EW Gateway CC	
78%	22%

¹Purchased, evaluated data and did not use.

²Purchased "Worker File", not Standard Package. File just received

³Purchased, had not received at time of interview.

⁴Did not purchase due to inaccuracy of data.

⁵Rhode Island purchased a statewide file by special arrangement with the Bureau of the Census

⁶Readjusted file not received at time of interview

⁷File was purchased and provided by the State Department of Transportation

Table 2. Frequency of Use of the Standard Package by Purchasers

Extensive	Occasional	Rare/Never
1. Buffalo: NFTC	1. Akron: AMATS	1. Texas: SDHPT
2. Chicago: CATS	2. CALTRANS	
3. Little Rock:	3. Ga.: DOT	
4. New York: DOT	4. Phoenix: Maricopa	
5. NY, NJ, Ct.: Tri-State	5. Portland: CRAG	
6. Rhode Island	6. Miami: Metropolitan	
7. San Diego: CPO	Dade County ²	
8. Spokane: RPC	7. Minn.-St. Paul:	
9. Ohio: DOT	Metropolitan Council	
10. Philadelphia:	8. St. Louis EW Gateway CC	
DVRPC		
11. San Francisco: MTC ^{1/}		
12. Mass. DOT ^{3/}		
13. Albuquerque: MRG COG		
59%	36%	5%

^{1/}Had not completed allocation; use shown is anticipated

^{2/}Limited Purposes

^{3/}Had not yet received complete file; extensive use is anticipated

Table 3. UTPP Used by Extensive and Occasional Users

-
1. Buffalo NFTC
 2. Portland CRAG*
-

10%

-
1. Akron AMATS
 2. CALTRANS
 3. Ga. DOT
 4. Little Rock Metroplan
 5. New York DOT
 6. San Diego CPO
 7. Spokane SMATS
-

37%

-
1. Minn.-St. Paul Metropolitan Council+
 2. Phoenix: Maricopa COG
 3. Rhode Island+
-

16%

-
1. Albuquerque: Middle Rio Grande COG
 2. Chicago: CATS
 3. Mass. DOT#
 4. Miami: Metro Dade Co.
 5. NY, NJ, Ct.: Tri-State
 6. Philadelphia: DVRPC
 7. St. Louis: EW Gateway CC
-

37%

*Some use of Part III, also

+Some use of Part I, also

#Did not report use of Part II

2. Uses of the Standard Package

- a. Overall, the most frequent use of the Package by interviewed agencies was for Part I, socio-economic data distributed by traffic zone of residence - particularly population, housing, income and auto ownership. This data was mainly used for three major inputs to zonal and district level transportation models;
- The socio-economic component of trip generation rate calculations,
 - The socio-economic surface for calculating trip (productions) for use in trip distribution (e.g., gravity) models, and
 - Socio-economic base year data for regional growth models.

Agencies used Part I to replace their own staff work to allocate "by judgement" socio-economic information (e.g., income and auto ownership) from Census tracts to traffic zones. If Part I had been available sooner after publication of the tract data, even more agencies would have used it.

- b. Use of Part II, Urban Area Summary, was mentioned considerably less than Part I. Agencies using Part I mentioned the convenience of having the area wide totals as a benchmark for forecasting data and as control totals in factoring data to traffic zones or blocks and tracts.
- c. Although extensive use of Parts III and IV was anticipated by most purchasing agencies, these Parts have, in fact, received the least amount of use. The following intended uses were each mentioned by one or more agencies for comprehensive planning as well as transportation functions:
- (1) Employment distribution for calibrating models at both the zonal and district levels for
 - (a) Calculating trip attractions as an input to trip distribution models
 - (b) Providing a base year work area indicator for use in regional growth models.
 - (2) Transportation
 - (a) Bus route studies
 - (b) Carpooling studies
 - (c) File checks and comparisons
 - (3) Economic base studies

- (4) Housing
 - (a) Indicator of demand
 - (b) Indicator of future trend from rental to ownership
- (5) Subarea unemployment impact analysis
- (6) Interjurisdictional interdependencies
 - (a) HUD Community Development (Commuting)
 - (b) Payroll taxes
- (7) Air pollution impacts and amelioration
 - (a) Daytime population locations
 - (b) Carpooling
 - (c) Special transit
- (8) Energy conservation
 - (a) Carpooling
 - (b) Special transit
- (9) Retail location and marketing studies

There are two principal reasons why Parts III and IV have not yet been used as fully as the agencies intended. First, many of the agencies with the most ambitious plans to use Place of Work/Journey to Work (POW/JTW) data had just recently received the Census tapes (Chicago: CATS), not yet received them (Mass. DPW), just received an adjusted version (NY, NJ, Ct.: Tri-State) or not yet received an adjusted version (San Francisco: MTC). All of these agencies are anticipating extensive use of Parts III and IV.

Second, many agencies found the level of accuracy and precision of Parts III and IV too poor for as extensive use as had been intended. This problem is discussed below in section 3-a.

The major intended use of Part III was for employment distribution (1 above). Actual use for this purpose has been as a component input rather than as the major input as usually had been intended. Other actual uses reported were for bus route studies (2-c above), carpooling studies (2-b), file checks and comparison (2-c), data for HUD Community Development Block Grants (6-a), and energy conservation planning (8-a and b).

Ninety percent of the agencies, including both those who are non-users, anticipated that the problems with Parts III and IV could and would be resolved in the 1980 Census.

3. Problems and Issues Regarding the UTPP

All agencies interviewed experienced some problems with the UTPP. There were also some differences of opinion. Problems and issues perceived by agencies varied widely, depending on the quality of the data that the agency received, the data requirements of the agency, and the particular planning problems the agency currently faced. However, these criticisms and comments can be synthesized into five major categories as follows:

- a. Accuracy and Precision of Data
- b. File Flexibility
- c. Processing Time
- d. Documentation
- e. Attitudes Toward 1980 POW/JTW and UTPP.

a. Accuracy and Precision

Comments concerning accuracy and precision of the UTPP data were more frequent than those on any other topic. Agency opinions tabulated in Table 4, in this area, fell into four basic categories:

	<u>Parts I & II</u>	<u>Parts III & IV</u>	<u>Agencies</u>	
			<u>Number</u>	<u>%</u>
1.	Acceptable	Acceptable	3	14
2.	Acceptable	Acceptable with Adjustments	5	36
3.	Acceptable	Unacceptable	9	41
4.	Unacceptable	Unacceptable	2	9
			<u>19</u>	<u>100%</u>

Agencies commenting on the inaccuracies of the data generally cited one or more of five factors as the probable causes of the inaccuracies. These were:

- (1) uncodable responses to the place-of-work question
- (2) defective address coding guides
- (3) equivalency table errors
- (4) lack of full geographic coverage of the transportation study area for place-of-work and journey-to-work tabulations
- (5) sample size

Table 4. Accuracy and Precision of Data

	Parts I & II		Parts III & IV		
	Acceptable	Unacceptable	Acceptable	Useable with Adjustments	Unacceptable
Akron: AMATS	*				*
Albuquerque: Middle Rio Grande COG	*			*	
Buffalo: NFTC	*				*
Calif. CALTRANS	*				*
San Diego CPO	*				*
San Francisco: MTC	*			*	
Chicago: CATS	*		*		
NY: DOT	*				*
Miami Metropolitan Dade County	* ¹			*	
Ga. DOT	*				*
Mass. DOT	*			*	
Minn. - St. Paul: Metropolitan Council	*			*	
Philadelphia: DVRPC	*			*	
Little Rock, Metroplan	*				*
Colo. DOH	*				*
Phoenix: Maricopa COG	*		*		
Portland CRAG		*			*
St. Louis EWGCC	*			*	
Spokane SMATS	*				*
Texas SDHPT		*			*
Rhode Island	*		*		
NY, NJ, Ct.: Tri-State	*			*	
	<u>91%</u>	<u>9%</u>	<u>14%</u>	<u>36%</u>	<u>50%</u>

¹/With Adjustments

(1) Uncodable Responses

In the mailback self-completed questionnaires which predominated in the 1970 census, the place of work was ascertained by a single question, "Where do you work?", with blanks provided for street address, a street name, post office, and ZIP code. Nationwide, only 53 percent

of the responses were codeable to block and thus could be aggregated to traffic zones. The remainder were coded to "Universal Area Codes" (UAC's) and to ZIP codes. Many jurisdictions (Tri-State, San Francisco) are attempting to overcome this problem by allocating uncodeable trips.

Agencies using Parts III and IV at the district or jurisdictional level did not always perceive the uncodeable responses as an insoluble problem--even in the absence of allocation procedures (Chicago, Rhode Island). In Massachusetts, the UAC's are coterminous with towns and Parts III and IV were considered as valuable for broad statewide and substate policy purposes.

To minimize this problem in 1980 many agencies suggested changes in the format of the place-of-work question (included under Recommendations below). Also, with only two exceptions (Texas, Southeast Wisconsin) and one "no opinion" (Kansas City), all agencies expressed a strong willingness to assist the Census in the coding of problem responses.

(2) Address Coding Guides

The quality of address coding guides (ACG's) throughout the country in 1970 varied considerably. Areas which are satisfied with their UTPP invariably had high quality address coding guides. A typical comment: "Rhode Island's data was generally acceptable, but the DIME area was much more accurate than the rest of the state." In many jurisdictions, the MPO's, unhappy about the quality of the UTPP, blame the address coding guide (e.g., "We made it and we know how bad it is."). Consequently, there is now a much higher appreciation than in 1970 of the critical importance of accurate, up-to-date ACG's. Most agencies would rate the ACG along with the wording of the POW question as the two most necessary improvements to be made in Census preparations for 1980 to improve the quality of the POW/JTW data.

There are wide differences among the agencies as to the expected state of readiness of their ACG's for coding the POW/JTW data. Many feel that they are or would be fully prepared. Others expressed concern. "We feel that the need for accurate and up-to-date ACG/DIME or GBF files is critical regardless of how the Census Bureau rewords the question or handles the processing. The MPO's have repeatedly stated that they do not have the funding sources for this effort . . ." (CALTRANS). There was some concern as to whether transportation funding for ACG preparation for the 1980 Census will be as strong as it was prior to 1970.

(3) Equivalency Tables

These are the tables, provided by the transportation agency to the Bureau of the Census, that designate which blocks are to be aggregated together to form each traffic zone. In some jurisdictions, these tables were very poorly done, contributing to unuseable data. One study, Metropolitan Dade County, which felt that its ACG was excellent and its percentage of codeable POW/JTW addresses was high, reported that the errors could not readily be detected in the verification materials. Serious errors were formed during subsequent use, but by then all back up, detail data, tapes had been destroyed and corrections were infeasible. Improvements in geocoding and verification strategies were suggested.

(4) Geographic Coverage

There are several dimensions to problems of geographic coverage (Table 5). Many agencies expressed the need for more complete coverage to improve the utility of Parts I, III and IV. The problem for Part I was somewhat different than that for Parts III and IV. UTPP coverage for traffic zones often did not extend to the entire transportation study area, much less to the entire SMSA. The explanation usually given for this was the limited areal coverage of the ACG. Some agencies pointed out that in 1980 this problem would not be so severe since their traffic zones had now been modified to conform more closely to Census Tracts. In the outlying areas tracts and zones tend to be close in size and coterminous; in in-lying areas several zones may compose a tract.

Table 5. Geographic Coverage

Insufficient		Sufficient
Whole SMSA	Outside SMSA	
1. Buffalo: NFTC	1. Albuquerque: Middle Rio Grande COG	1. Mass. DPW*
2. Chicago: CATS	2. Ga. DOT	2. Rhode Island*
3. NYS DOT	3. NYC: Tri-State	3. Akron: AMATS
4. Minn. - St. Paul Metro Council	4. CALTRANS	
5. Philadelphia: DVPRC		
6. Phoenix: Maricopa COG		
7. Portland: CRAG		
8. Wash. COG		
53%	27%	20%

*Entire State was covered by published data because UAC's equaled townships.

The second problem of coverage was much more serious for users and intended users of Parts III and IV. POW/JTW responses were not always coded across SMSA boundaries. This led to several complaints. First, that important inter-metropolitan area and hinterland-SMSA travel patterns could not be ascertained from either the UTPP or from published data. These were considered important for some of the POW/JTW data uses listed in II, B.2 above. Second, this resulted in under-reporting of POW/JTW data. While one study estimated that under-numeration resulting from this factor might be as high as 20 percent, it was indicated that for the median SMSA, the figure is about 4.0 percent.⁷

Relative to the three previous factors--uncodeable responses, ACG's and equivalency tables--"the fact that POW/JTW responses were not coded across SMSA boundaries would be a minor contributor to the error rate" (CALTRANS). Further, "there are also two 'commuter sheds' composed of adjacent and economically dependent SMSA's in California in which POW/JTW responses are coded across SMSA boundaries." It, therefore, appears that when agency responses are put in perspective that limited geographic coverage of the coding was generally of relatively minor importance, but in a few cases may have been significant.

(5) Sample Size

Some agencies attributed discrepancies in zone level data in Parts I, III and IV to too small a sample size. For example, Texas SDHPT found that POW data gathered from an O & D survey with a 12½ percent sample was not accurate or useable by tracts. The control was a 100 percent employment survey. However, sample size as a possible cause was disputed by other agencies who pointed to the fact that the 15 and 20 percent sample used by the Census was larger than the samples used in many home interview origin-and-destination surveys conducted by urban transportation studies.

These are several important perspectives that should be developed here. As noted earlier, most agencies considered the data received for Parts III and IV as inadequate for their purposes. Considering the value which many of these agencies had anticipated that the UTPP would have for them, it could be expected that feelings about the UTPP were running strong in many of the agencies. In light of this, it

⁷Middle Rio Grande COG, Test and Evaluation of Data From the Standard Package of Census Data for Urban Transportation Studies (FHWA: Washington, DC), 1973, Appendix D.

is particularly significant that most agencies feel that the problems with the Package can and should be satisfactorily corrected for 1980. Nearly all agencies indicated their willingness and desire to attack the problems within their sphere, such as ACG's, equivalency tables and problem coding. Many have already taken such steps. These attitudes and actions reflect the importance attached to the POW/JTW data.

There is also widespread appreciation of the difficulties of obtaining information on POW/JTW by a mail-back questionnaire and through the use of ACG's. The strong endorsement of the POW/JTW data and of the UTPP by the transportation agencies appears not to be based on the assumption that all problems can be eliminated, but rather that alternative data sources are either inferior, too expensive, or non-existent.

b. File Flexibility

Next in importance to the problems of data accuracy and precision were the problems associated with file flexibility. Several agencies (NYS DOT) noted that virtually all the data they needed was collected by the Census, but that aggregation of the data to tracts or traffic zones made it impossible to manipulate the files to obtain cross-tabulations in addition to those reported in the Census publications or tapes. The newer disaggregate models, which many agencies hope to utilize in the near future, require more cross-tabulations of the multi-tiered form for small geographic units; e.g., "work trips by mode by family size by income". The problem of file flexibility is, however, closely related to sensitive questions of confidentiality and disclosure of information. In this context, many agencies mentioned the Tri-State "worker file" as an ideal technique to deal with this problem.

c. Processing Time

There is considerable dissatisfaction with the amount of time required to make the journey-to-work and place-of-work information available. It is recognized that the Bureau of Census was conducting a new procedure, and that agency delays in producing conversion tables and in ordering the TUPP had contributed to the delays. There is a widespread feeling that most of these timing problems could be correctable by Census and Agency joint planning for 1980.

Furthermore, after delivery of the tapes by the Bureau of Census, many agencies experienced further delays while adjusting the data to compensate for the problems of accuracy and precision (B.3.a. above). Some of these adjusted tapes are just now being received for use in latter 1975. Some local officials, civic groups and citizens, aware of how rapidly socio-economic situations can change, are discounting or challenging the 1970 data.

Several agencies reported that if Part I or Part III had been received earlier, it would have saved them time and money, or improved the quality of their modeling. However, to meet deadlines for modeling, they had to either massage the required socio-economic data from other sources or use their own out-of-date files.

d. Documentation

All agencies felt that the documentation that accompanied the UTPP tape was complete. There was strong feelings in some agencies that the entire inter-agency operation might have proceeded more smoothly if the advance information about the package had been more complete and had been absorbed at the higher management and policy levels. The feeling is that more top-down support within the MPO would result in better agency handling of the arrangements for the UTPP such as the preparation of the ACG and the equivalency table.

e. Attitude Toward 1980 POW/JTW

The question "If the accuracy of the POW/JTW is improved to the extent feasible in 1980, would you purchase it?" provided the array of responses shown in Table 6. The responses fall into a spectrum from "Strongly No" to "Strongly Yes." with a "gray line" between categories.

Eighty-eight percent of the agencies interviewed translated their experience with the 1970 UTPP into a more or less positive expression that the POW/JTW be continued and strengthened for 1980. Their many recommendations for improving this data are summarized in Part III below.

On the strongly negative side of the spectrum, two agencies (Texas and Southeast Wisconsin) felt that the UTPP was not of enough value to them to justify having the questions in the 1980 Census. Their reasons were quite different. Texas felt that the basic system was unworkable, whereas Southeast Wisconsin felt that transportation and comprehensive planning agencies must have their own surveys (O & D, etc.) and that the Census POW/JTW was in effect a diversion of effort.

Table 6. Should There Be a POW/JTW in 1980?

Strongly No	No Opinion	Cautiously Yes	Definitely Yes	Strongly Yes
Milwaukee: SEWPC Texas SDHPT	Houston: H-GRTS Kansas City: MARC*	Calif.: CALTRANS Ga. DOT* Penn Cot** Portland: CRAG	Akron: AMATS Baltimore RPC Colo. DOH Denver: DRCOG Little Rock: Metro- plan Md. DOT Miami: Metro Dade Co. **** Minn.-St. Paul: Metro Council Ohio DOT Philadelphia: DVRPC Phoenix: MCOG St. Louis EW Gateway CC San Diego MPO San Francisco: MTC Seattle: PSGC Spokane: SMATS Wash. COG	Albuquerque: MRCOG Buffalo: NFTC NYS DOT Chicago: CATS Mass. DPW NY, NJ, Ct.: Tri-State *** Philadelphia: DVRPC Rhode Island
2 6%	2 6%	4 12%	17 52%	8 24%

-20-

*Reluctant to comment because of inaccuracy of 1970 data

**Reluctant to comment because of lack of familiarity with the data

***In a "worker file"

****Provided there are improved geocoding strategies

In the "no opinion" category were two agencies (6 percent) who declined to express an opinion. This reluctance was to their bad experience with the 1970 data, and uncertainty as to the improvements that might be made for 1980.

Four agencies (12 percent) strongly qualified their "yes" to the question. Three of these (Ga. DOT, Portland) found their 1970 data unuseable and, while feeling that a workable package was possible for 1980, were reluctant to commit themselves until a more specific proposal is presented.

Sixteen of the 17 agencies in the "Definitely Yes" category (45 percent) based their opinion on significant experience with the 1970 data. The 17th (Seattle) had given the question careful study. All felt that a workable package is technically feasible, clearly needed and economically justifiable for 1980.

The eight agencies (24 percent) classified as "Strongly Yes" were distinguished from those in the previous category by the strength of their convictions. They might be classed as "zealots." Like those in the "Definitely Yes" category, they had a strong basis in experience for their positive opinion. All were purchasers of the 1970 data and had either used the data, or in the case of Tri-State and Mass. DOT who were just receiving the data, had given possible applications very careful study. Most, in fact, were continuing to use the 1970 data regularly.

In summary, it is instructive to note that over 76 percent of the agency responses - those in the last two categories - had both carefully considered and were strongly supportive of the POW/JTW data.

These highly favorable opinions were based on agency conclusions that despite problems which can be corrected or lived with, the Census POW/JTW is a unique source of information for some purposes and the most cost/effective for others.

C. Issues Regrading Other Aspects of the Census

Compared with the interest in the UTPP and the POW/JTW question, there were relatively few comments regarding other aspects of the Census. The following five topics are those which occurred most frequently.

1. Census - The Main Source

There is complete agreement on the fact that transportation agencies are dependent on the Census, with or without the UTPP, as their main source of demographic, socio-economic and housing data for transportation and comprehensive planning data models. If it were not for the Federal Census, local and state governments would be spending comparable amounts of money for data collection. Further with a multiplicity of local and state programs there would be some losses in quality and national comparability and availability of data. Moreover, there is general satisfaction among the agencies with the overall performance of the Census.

2. File Flexibility

The most frequent complaint, other than POW/JTW, was the lack of file flexibility in regard to all of its data (NYS DOT). See discussion in regard to UTPP data above.

3. Geographic Comparability

A number of agencies asked that the data produced by the non-population Censuses--business, transportation, etc.--be made geographically comparable with that from the Census of Population and Housing. The non-comparability of geography is a major reason for the limited use of the non-population Censuses by planning agencies. Usually agencies with attitudes on this topic went further and asked that all Federal agencies gather information on the same geographic basis, and that definitions be standardized.

Some states and regions have experienced what they consider as too frequent and unnecessary changes in Census tract boundaries. They would like to see stronger guidance from the Census to local Tract Committees to enable them to anticipate and minimize problems.

4. Data Obsolescence

An issue analogous to that of UTPP Processing Time (B.3.c. above) is that concerning need for a mid-decade Census. Many agencies felt that there is a strong case for a mid-decade Census, based on rapidly changing local socio-economic situations. The "shelf life" of data was most often set at five to seven years. Without updating the data, local officials, enterprises and other groups affected by these changing situations are often skeptical about plans and policies based on old data (Little Rock, NYS DOT). A few agencies felt that a mid-decade Census is of lessor priority to them than other data needs, such as that for POW/JTW data (Akron, Philadelphia).

5. Additional Data Items

Relatively few comments were received concerning recommendations for new data items to be collected for the 1980 Census. Rather, most agencies felt that the data they required for transportation planning was currently collected by the Census Bureau. Instead, as noted above, their data problems relative to the Census, concerned the form of tabulation of the data, the flexibility of data files, geographic coverage, accuracy, processing time, etc.

The largest number of suggestions and questions toward additional data collection centered on identification of the number and location of transportation handicapped persons. Many agencies (Denver, CALTRANS, Tri-State) felt that such data is important, but there was widespread skepticism as to whether this lent itself to collection by the Census. Several agencies raised the question of how the "transportation handicapped" might be defined. Others pointed out that the transportation handicapped group was actually composed of a number of sub-types for which the Census actually does have data--the young, the aged, the poor, the employment handicapped, etc..

Miscellaneous requests for further data collections are tabulated under the "Recommendations" below.

D. Modeling Trends and Data Requirements

This section places Census use by transportation agencies into the larger perspective of trends in modeling and alternative data sources. The section will set the stage for the summary of agencies' recommendations following in Chapter III.

1. Land Use and Regional Growth Models

Many of the agencies interviewed did not engage in the use of regional growth or land use models. They received this information from land use and comprehensive planning agencies with which they cooperate on transportation modeling and planning.

There is a considerable interest in, and a definite trend toward, cooperative forecasting of land use. In cooperative forecasting each agency contributes knowledge, judgements, and skills to a completely interactive, joint process, and the product is iteratively reviewed and adjusted with the hope of achieving acceptance by all agencies. Typically, the transportation agencies may provide the computer and mathematical capabilities while the comprehensive planning agencies provide the model inputs based on local knowledge and expectations of

land use, housing, population, employment and policies. All agencies may contribute to adjustments in the resulting forecast -- local agencies, their indigenous knowledge, and state agencies, their experience in other areas. Both aggregate and distributive forecasts may be involved.

A number of computerized models are in use: EMPIRIC (e.g., Wash. COG), I-PLUM (Philadelphia: DVRPC) and DTAM (Direct Trip Allocation Model, e.g., Cleveland). In smaller areas, the land use forecast is often prepared manually by the comprehensive planning agency.

In connection with the current project, it should be noted that regional growth models usually require Census data--for example, socio-economic data--such as population and dwelling units--and employment distribution data. Both of these are available through the UTPP for the traffic zones utilized by the models.

Regional growth models were originally used primarily in the process of testing long-range transportation plans for transit and highway capital improvement programs. New uses seem rapidly to be coming to the fore. The models are being used to forecast the consequences of land use developments differing from those anticipated in the original forecast. They are being used, often at a district (group of zones) level, to forecast the effects of alternative development policies. Finally, there are some indications of increasing use of the regional growth models for short-range forecasts in connection with operational planning and capital improvement programming.

2. Transportation Models

The trip distribution and assignment models are usually the standard FHWA and UMTA types. There are variations, as in Texas and New York.

Many agencies expressed an interest in disaggregate models and are following their development very closely. Significant for the Census is the fact that these models will require cross-tabulations of a disaggregate type that are now not readily available. These agencies expressed considerable concern about the Census file structure and would like to see the Census file structure changed to something more flexible. This is the problem of "file flexibility" discussed earlier (II.C.2).

3. Surveillance

All agencies reported that they reviewed and updated their forecasts and plans periodically. Many indicated that some slippage in their schedules occurs.

Monitoring of local land developments may be done by either the transportation agency or the comprehensive planning agency. The principal source may be building permits, water connections, or aerial photos.

There also appears to be a developing interest in monitoring changes in travel behavior, rather than merely forecasting travel volumes, as has been the emphasis in past years. The interest seems to center on securing time series for such variables as vehicle miles of travel, vehicle registrations, number of trips and trip length.

4. Employment Distribution

An exception to the general shift toward less primary data collection by transportation agencies (below) appears to be area employment distribution. Employment data is basic to a wide range of activities with which the transportation and comprehensive planning agencies are increasingly involved. Its main use for transportation in the past has been trip generation to anchor the attraction end of the work trip in distribution models. The full list of uses for employment distribution data identified in the interviews was listed in section II.B.2.

There is no good single source of employment distribution data. The transportation agencies would seem to be in near unanimous agreement that, with the problems in 1970 POW data, this is the major current shortcoming of the U.S. Census. The depth of feeling regarding the need for a good source of employment data is evidenced by the number of unsolicited suggestions received for the development of a source. The most frequently proposed, other than through the Census, were for including the place of work in employers' employment security reports or W-2 income tax forms, or on personal income tax returns. The conclusion of these speculations was always that improving the Census POW data was the best hope.

Today, the most common source is employment security files, covering those employees which have unemployment compensation. There are major shortcomings with this source -- the two most important being that not all employees are covered (notably many governmental employees) and, secondly, that the data is not geographically coded in detail. The second problem can only be solved in part through use of an address coding guide. Further complications develop: the address of records in these files is that of the payroll/accounting/headquarters office, which often is different from the main location of employees' work and most certainly different when there are multiple locations for the firm's employees. The amount of work necessary to produce a satisfactory employment distribution file from employment security data is of such magnitude that it might well be classified as a primary data source.

In fact, many agencies are now doing their own employment surveys. In Texas the standard procedure for producing an employment distribution file is to gather this information as a part of the land use survey. The number of employees is estimated by the "windshield" method for small establishments (under five to 10 employees). Texas DOH & PT has found that approximately 80 percent of employers are small establishments and that this estimating technique is sufficiently accurate and effective. For larger establishments, the land use surveyers enter and interview the employees. Atlanta Regional Council has purchased a commercial listing of business telephone numbers and in 1975-76 is doing a \$300,000 telephone and mail survey to obtain employment data. All locations are geo-coded compatibly with the ACG and can, therefore, be aggregated to traffic zones, Census tracts or other subareas. The establishment records are designed to facilitate subsequent checking, updating and correlating through use of employment security and Census POW data.

Some agencies are experimenting with private data sources. Ohio DOT has just purchased Dunn and Bradstreet files for 12 of its urban studies. Dunn and Bradstreet appears to be the most promising of the larger sources, as it reports an employer's various locations. It, of course, is not complete, even for non-public employment, and will, like covered employment data, require substantial supplementary survey work by the agency.

There is, in fact, a decided trend toward the creation of regularly updatable employment distribution files that build on time series information and multiple sources (Atlanta, San Diego). Many agencies are counting on the 1980 Census place-of-work data as either the mainstay of, or as an important component to, their employment distribution file maintenance efforts. The importance of the Census POW/JTW stems from the fact that it is (1) a major source of employment data by small areas, and (2) provides a wealth of socio-economic information about workers at their place of work not available from any other source. Several agencies reported that they had built their data system around the expected 1980 Census place-of-work files. Clearly, the agencies attach great importance to employment data by place-of-work. In addition to their own functions, some MPO's connected POW data with the service function expected of them as a somewhat vulnerable regional agency. Many consider provision of employment data by small areas one of the more important and appreciated services that they render for local government and other organizations. Some considered this service as bearing on their survival as a regional agency.

5. Data Sources

In this section are several observations about data sources that have not been made elsewhere.

a. Agency Interdependence

Transportation agencies are heavily interdependent with other agencies for data sources. In particular, the transportation agencies are dependent on comprehensive planning agencies for land use data and forecasts. The latter agencies often look to the transportation agencies for funding, quantitative methods and computer capabilities, and transportation data.

The division of agency functions between state, sub-state, regional and local varies considerably from state to state, and area to area. But, whatever way the functions are divided, interagency dependencies are created.

b. Primary Data Collection

There is a widespread trend to avoid massive primary data collection. There appears to be several reasons for this shift. One is the current and continuing austerity in transportation system financing introduced by inflation and the energy crises. Another is the growing concentration of professional transportation planners on policy and implementation problems and on new issues. Finally, there is a sense that in some areas of modeling, such as trip generation, enough data collection and research has been done that synthesis of data inputs is feasible. Southeastern Wisconsin, as previously noted, is a singular exception to the general trend.

Most agencies have considerable confidence in their ability to update their models based on synthesizing trip generation data from other cities or updating their own previous surveys through the use of mini-O&D's, involving very small samples. Several agencies felt that, regardless of their present competence to synthesize trip generation factors, their efforts could be strengthened by national research on the transferability of such data.

c. Federal Statistics

Few agencies make extensive use of Federal Statistics other than the Census. As noted above, one of the major reasons for this is the problem of compatible geography with the population Censuses. An additional problem is the lack of standardization of definition of the data items reported.

Table 7. Prospects for Extensive Primary Data Collection

Little or None	Much
Akron: AMATS Baltimore: RPC Buffalo: NFTC Calif.: CALTRANS Chicago: CATS Colo. DOH Denver: DRCOG Md. DOT Mass. DPW NYS DOT NY, NJ, Ct.: Tri-State Philadelphia: DVRPC Phoenix Rhode Island Seattle: PSGC Wash. COG Miami: Metropolitan Dade Co.	Kansas City: Mid-America Regional Council Milwaukee: SEWPC Texas SDHPT
85%	15%

d. Private Sources

There seems to be relatively little use made of commercial data sources such as Dunn and Bradstreet, Polk, etc., although there are some significant exceptions to this (e.g., Atlanta, Wichita, Ohio studies, Philadelphia). In some areas, use is made of data from private utilities, such as electric meter connections.

E. Agency Recommendations

This section lists agency recommendations without endorsement by the contractor. The supporting rationales for the recommendations are summarized in the preceding sections.

1. The POW/JTW questions should be retained for 1980.
 - a. Question 29c should be modified to include more information to assist coding to block level; e.g., name of employer, building, nearest intersection, landmarks, etc..
 - b. New geocoding and verification strategies should include a generation file (major employers, buildings, etc.) and more effective verification procedures for agencies.

- c. Means should be developed to permit MPO's to assist in the coding of problem responses without violating rules of confidentiality.
 - d. Coverage of coding to the block level should include all locations in the SMSA, even when the place of residence is external.
 - e. The POW/JTW should be coded across the boundaries of adjacent SMSA's.
 - f. The sample size of the POW/JTW should be increased (a disputed proposal).
 - g. All means of improving the quality of employment distribution data should be pursued. In addition to the POW question, this might include improvements in the Census of Business, employment security and income tax procedures.
 - h. Usefulness of published POW/JTW data would be enhanced if larger jurisdictions could be broken up into districts or sectors (e.g., San Francisco might be reported in four quadrants).
2. The UTPP should be retained.
 - a. Both agencies and the Census should give more attention to their respective tasks in making the Package available as soon as possible. The various impeding problems should be anticipated and resolved in advance; e.g., adjusting the data not codeable to block level, the number of permissible digits in zone codes, etc..
 3. A "worker file" (like that at Tri-State) option should be available for agencies that require greater flexibility in manipulating their files.
 4. The CUE program - Correction, Updating, Extension - should be augmented to ensure that ACG's are ready for 1980 Census use.
 5. The compatibility of geographic areas and data definitions, within the Census and between the data collection efforts of all Federal agencies, should be given intensified attention.
 6. The work trip (question 29d) should be clarified and amplified; e.g.:
 - a. Including time of start of trip, time of start of return to home, and/or time of return home.
 - b. Limiting trips reported to those made on preceding week day.
 - c. Including all work trips, i.e., those for second jobs.
 - d. Excluding the word "private" in the phrase "private auto" so as to include company cars.
 - e. Including other modes, such as pickup, other truck, bicycle and motorcycle.

7. There should be a supplemental origin and destination survey, coordinated with the Census, to provide:
 - a. All trips - non-work as well as work trips.
 - b. Land use at origin and destinations.
 - c. Trip start, end and elapsed times.
 - d. Trip distance.
 - e. Coordination with a means of providing land use acreages for the calculation of trip generation rates.
 - f. Calculation of vehicle miles of travel.
8. There should be more workshops, training sessions, user groups, computer program exchange groups to facilitate (a) the dissemination of knowledge about Census use and (b) the working out of agency problems on the use of Census data.
9. There should be a mid-decade Census (while all agencies agree on the desirability of this, there seems now to be some second thoughts about its relative priority compared with the POW/JTW data).

III. CONTRACTOR'S COMMENTS AND RECOMMENDATIONS

This chapter summarizes the contractors own comments and recommendations concerning the 1980 Census.

A. Place of Work/Journey to Work

With 80 percent of the agencies interviewed indicating that they would purchase a reasonably accurate Standard Package of POW/JTW data from the 1980 Census, there is obviously a high demand for this data. Most agencies' analyses have led them to the conclusion that the majority of the problems associated with the 1970 POW/JTW can be corrected, and that those that can't, can and should be lived with. The POW/JTW is clearly appreciated as a unique source of employment distribution data and as more cost-effective than the alternatives.

Recommendation: That the POW/JTW questions be included in the 1980 Census.

Recommendation: That question 29c be modified to increase the percentage of codeable responses. For example, that the following location information be asked for:

- (1) Street address
- (2) Name of employer or building
- (3) Nearest intersection
- (4) Jurisdiction (not Post Office)

ZIP codes should not be used in tabulations as they are subject to change.

Recommendation: That question 29d include additional modes - bicycles, motorcycle, car pool, truck - and that the word "private" be dropped. Conforming to the Department of Housing and Urban Development Annual Housing Survey, Survey of Travel to Work supplement. This would provide valuable information related to energy conservation and changing life styles.

Recommendation: That question 29d be changed to request indication of all modes used during the work trip. This will provide information on mode linkages in multi-modal trips.

Recommendation: That consideration be given to including:

- (1) The start time of the journey home (or of the trip to work), and
- (2) The perceived door-to-door travel time of the JTW;
- (3) All work trips including those for a second job.

Recommendation: That all work places within the SMSA be coded, regardless of whether the place of residence is external or not. (This could be an extra cost option elected by an MPO).

Recommendation: That some procedure be developed to permit MPO's to assist in coding of POW responses not codeable by automated means.

B. Address Coding Guide

There is understanding at the agency technical level of the vital role which the address coding guide (ACG) plays in a mail-back Census and in coding the POW/JTW questions - and the agency's responsibility for the quality of the ACG. However, success of this aspect of Census preparation depends on understanding and support from higher level officials, and on adequate funding of the program for correcting, updating and expanding (CUE) the address coding guide.

Recommendation: That the Federal agencies involved - particularly FHWA, UMTA, Census, HUD, HEW, OMB - strengthen their coordinated efforts toward preparation of adequate ACG's by the metropolitan planning agencies. Efforts should include:

- (1) Assessment of the present condition of the ACG in each urban area with respect to accuracy, currency, and coverage, and the assessment of the level of funding and other conditions needed to ensure its adequacy for the 1980 Census. This might best be accomplished through the FHWA field organization. Funding through CUE funds, HPR funds or other means could and should then be matched to the need.
- (2) Adequate funding of the program to correct, update and extend (CUE) the ACG's. While the Census' CUE and FHWA's HPR funds appear to be the mainstay of current efforts, geographically disaggregate data appears to be critical to many other Federal program objectives, especially in HUD and HEW.
- (3) Coordinated attention to all four of the address coding aids required in connection with the Census (particularly coding of the POW/JTW) -
 - (a) ACG
 - (b) Major employer and building name guide
 - (c) Intersection coding guide
 - (d) Equivalency tables, if the Standard Package is to be ordered.
- (4) Information to local elected and executive officials as to the importance of the ACG. A sign-off by the agency head should be required to certify the quality of the address coding aids when they are transmitted to the Census. Publicity should be given to the importance of this MPO role.
- (5) Extension of the address coding aids to include the entire SMSA to minimize the need to code to UAC's.
- (6) Training of responsible MPO, state and Federal personnel in the improved techniques for address coding aids.

Vital as the ACG is to the Census, it is also potentially valuable for a wide range of local, regional, private, state and national information purposes. Further realization of these potentials would support both Census and DOT interests in the ACG.

Recommendation: A Federal interagency effort to identify current and potential uses of the ACG, their cost-effectiveness and ACG problems and ways of dealing with them, and to develop understanding and skills at the local and regional levels.

C. Standard Package

Recommendation: The option of purchasing an Urban Transportation Planning Package be continued for 1980.

Recommendation: That an optional "worker file", similar to that now in use by the Tri-State Regional Planning Commission be made generally available.

Recommendation: That consideration be given to placing the coding refinement required by some agencies on an optional basis (e.g., those in the last two recommendations under A above).

D. Vehicle Availability

Questions of energy consumption, travel demand forecasting, changing life styles, etc., require more precise information on the increased use of motor vehicles by type.

Recommendation: That question H23 request information as to the type of licensed vehicle - pickup, other truck, motorcycle, etc. - and provide for 4, 5, 6, or more vehicles.

E. User Competencies

Recommendation: That more Federal support be given to dissemination of knowledge and development of skills regarding Census use by local, regional, and state agencies. The means may include workshops, training courses, user groups, TRB groups, professional agencies (e.g., AASHTO, ASPO, AIP, ITE), computer program exchanges, etc..

APPENDIX A

CONTENTS OF URBAN TRANSPORTATION PLANNING PACKAGE (UTPP) TAPES

Tabulation
Number

Title

NOTE: Part I Tables are tabulated for each Traffic Zone of Residence in the SMSA

IA-1	COUNT OF PERSONS BY AGE AND SEX
IA-2	COUNT OF PERSONS BY RACE
IA-3	COUNT OF PERSONS AGE 3 AND OVER BY LEVEL OF SCHOOL ATTENDING
IA-4	COUNT OF PERSONS AGE 16 AND OVER BY SEX AND LABOR FORCE STATUS
IA-5	COUNT OF EMPLOYED PERSONS AGE 16 AND OVER BY SEX AND MAJOR OCCUPATION GROUP
IA-6	COUNT OF EMPLOYED PERSONS AGE 16 AND OVER BY SEX AND MAJOR INDUSTRY GROUP
IA-7	COUNT OF EMPLOYED PERSONS AGE 16 AND OVER BY SEX AND CLASS OF WORKER
IB-1	COUNT OF HEADS OF HOUSEHOLDS (INCLUDING PRIMARY INDIVIDUALS) BY AGE
IB-2	COUNT OF HEADS OF HOUSEHOLDS (INCLUDING PRIMARY INDIVIDUALS) BY RACE
IB-3	COUNT OF HEADS OF HOUSEHOLDS (INCLUDING PRIMARY INDIVIDUALS) BY SCHOOL YEARS COMPLETED
IC-1	COUNT OF HOUSEHOLDS BY SIZE OF HOUSEHOLD
IC-2	COUNT OF HOUSEHOLDS BY NUMBER OF UNRELATED INDIVIDUALS
IC-3	COUNT OF HOUSEHOLDS BY NUMBER OF MEMBERS ATTENDING SCHOOL
IC-4	COUNT OF HOUSEHOLDS BY NUMBER OF MEMBERS EMPLOYED
IC-5	COUNT OF HOUSEHOLDS BY HOUSEHOLD INCOME
IC-6	COUNT OF HOUSEHOLDS BY AGE OF HOUSEHOLD HEAD OR PRIMARY INDIVIDUAL AND AGE OF YOUNGEST SON OR DAUGHTER
ID-1	COUNT OF HOUSING UNITS BY TENURE (OCCUPIED) AND TYPE (VACANT)
ID-2	COUNT OF HOUSING UNITS BY NUMBER OF ROOMS IN UNIT
ID-3	COUNT OF OWNER OCCUPIED UNITS BY VALUE
ID-4	COUNT OF RENTER OCCUPIED UNITS BY MONTHLY CONTRACT RENT
ID-5	COUNT OF VACANT UNITS BY DURATION OF VACANCY
ID-6	COUNT OF HOUSING UNITS BY PRESENCE OR ABSENCE OF COMMERCIAL ESTABLISHMENT
ID-7	COUNT OF OCCUPIED UNITS BY YEAR HEAD MOVED INTO UNIT
ID-8	COUNT OF HOUSING UNITS BY TYPE OF STRUCTURE
ID-9	COUNT OF HOUSING UNITS BY YEAR BUILT
ID-10	COUNT OF OCCUPIED UNITS BY AUTOMOBILES AVAILABLE

NOTE: Part II Tables are tabulated for the urbanized area.

IIA-1	COUNT OF HOUSEHOLDS BY SIZE OF HOUSEHOLD AND AUTOMOBILES AVAILABLE
IIA-2	COUNT OF HOUSEHOLDS BY SIZE OF HOUSEHOLD AND HOUSEHOLD INCOME
IIA-3	COUNT OF HOUSEHOLDS BY SIZE OF HOUSEHOLD AND TYPE OF STRUCTURE
IIA-4	COUNT OF HOUSEHOLDS BY AUTOMOBILES AVAILALABLE AND HOUSEHOLD INCOME
IIA-5	COUNT OF HOUSEHOLDS BY TYPE OF STRUCTURE AND AUTOMOBILES AVAILABLE
IIA-6	COUNT OF HOUSEHOLDS BY TYPE OF STRUCTURE AND HOUSEHOLD INCOME
IIB-1	COUNT OF WORK TRIPS BY MODE OF TRANSPORTATION, SIZE OF HOUSEHOLD AND AUTOMOBILES AVAILABLE
IIB-2	COUNT OF WORK TRIPS BY MODE OF TRANSPORTATION, SIZE OF HOUSEHOLD AND HOUSEHOLD INCOME
IIB-3	COUNT OF WORK TRIPS BY MODE OF TRANSPORTATION, SIZE OF HOUSEHOLD AND TYPE OF STRUCTURE
IIB-4	COUNT OF WORK TRIPS BY MODE OF TRANSPORTATION, AUTOMOBILES AVAIL- ABLE AND HOUSEHOLD INCOME
IIB-5	COUNT OF WORK TRIPS BY MODE OF TRANSPORTATION, TYPE OF STRUCTURE AND AUTOMOBILES AVAILABLE
IIB-6	COUNT OF WORK TRIPS BY MODE OF TRANSPORTATION, TYPE OF STRUCTURE AND HOUSEHOLD INCOME

NOTE: Part III Tables are tabulated for each Traffic Zone of Work in the SMSA.

III-1	COUNT OF PERSONS AGE 16 AND OVER BY SEX AND LABOR FORCE STATUS
III-2	COUNT OF EMPLOYED PERSONS AGE 16 AND OVER BY SEX AND MAJOR OC- CUPATION GROUP
III-3	COUNT OF EMPLOYED PERSONS AGE 16 AND OVER BY SEX AND MAJOR IN- DUSTRY GROUP
III-4	COUNT OF EMPLOYED PERSONS AGE 16 AND OVER BY SEX AND CLASS OF WORKER

NOTE: Part IV is tabulated for each Traffic Zone of Residence/
Work in the SMSA, with Summary for each zone of residence.

IV	COUNT OF WORKING PERSONS AGE 14 AND OVER BY TRAFFIC ZONE OF RESIDENCE AND MODE OF TRANSPORTATION
----	---

APPENDIX B

LIST OF AGENCY KEY PERSONS AND ADDRESS

This list is arranged in alphabetical order by states or central cities, and consists of:

1. Short title of agency as used in this report
2. Key person(s)
3. Agency address
4. Telephone number

Albuquerque: Middle Rio Grande COG

Mr. Al Pierce, Executive Director
Middle Rio Grande Council of Governments
Suite 1320 National Building
505 Marquette Street, N.W.
Albuquerque, New Mexico 87101
505/243-2819

Akron: AMATS

Mr. Charles A. Nelson, Economist
Akron Metropolitan Area Transportation Study
Suite 1129, Centran Bldg.
159 South Main St.
Akron, Ohio 449308
216/375-2436

Baltimore: RPC

Mr. William Ockert,

Mr. George McGimsey
Mr. James Rose
Baltimore Regional Planning Council
St. Paul St.
Baltimore, MD
301/383-5862 or 5844

Buffalo: NFTC

Mr. Edward H. Small, Jr.

Mr. John Finster

Niagra Frontier Transportation Commission
1875 Statler Hilton Hotel
Buffalo, New York 14202
716/856-2026

Calif.: CALTRANS

Mr. Charles Whitmarsh, Chief

Ms. Noreen Roberts, Senior Statistician
California Department of Transportation
Division of Transportation Planning
2520 Marconi Ave.
Sacramento, CA 95821
916/489-4959

Chicago: CATS

Mr. Suhail Al Chalabi
Chicago Area Transportation Study
300 W. Adams Street
Chicago, Illinois 60606
312/793-3464

Colo.: DOH

Mr. Ken Mick

Mr. Dave Rubel
Colorado Department of Highways
4201 East Arkansas Ave.
Denver, Colo. 80222

Columbus: OSU

Dr. Michael Godfrey
Transportation Research Center
Ohio State University
2070 Neil Ave.
Columbus, Ohio 43210
614/422-4061

Denver: DRCOG

Mr. David Klutz, Associate Director

Robert H. Fries, Transportation Planner
Joint Regional Planning Program
Denver Regional Council of Governments
Suite 200, 1776 South Jackson Street
Denver, Colorado 80210
303/758-5166

Georgia DOT and Ga. Tech

Mr. Buck Graham
Atlanta Area Transportation Study
404/656-5480

Mr. Robert Segó
Urban Planning Division
Georgia Department of Transportation
Atlanta, GA

Dr. Donald Covault
School of Civil Engineering
Georgia Institute of Technology
Atlanta, GA 30322
404/894-2235

Houston: H-GRTS

Mr. Ed. Koehn
Mr. Tom Lou
Mr. Robert D. Todd

Houston-Galveston Regional Transportation Study
Katy Street
Houston, Texas
713/869-3211

Kansas City: Mid-American Rgl. C.

Mr. Richard Davis, Director

Mr. Ken Howell

Mid-American Regional Council
20 West Ninth Street
Kansas City, Missouri 64105

Little Rock: Metroplan

Mr. Jason Rouby, Executive Director

Mr. John S. Harrington, Director of Planning

Mr. Keith Jones, Director

Pulaski Area Transportation Study

Metroplan
Continental Building
100 Main Street
Little Rock, Arkansas 72201
501/372-3000

Maryland DOT

Mr. Dennis Atkins, Director
Division of Systems Planning and Development
P. O. Box 8755
Baltimore-Washington International Airport,
Maryland 21240
301/768-9520

Mass. DPW

Mr. Thomas F. Humphrey, Director

Mr. Walter H. Kondo, Supervising Transportation Data Engineer

Bureau of Transportation Planning & Development
Department of Public Works
Commonwealth of Massachusetts
100 Nashua Street
Boston, Massachusetts 02114
617/727-7715

Miami: Metro. Dade Co.

Dr. C. W. Blowers, Chief

Ms. Lois Fonseca, Senior Planner

Planning Department
Metropolitan Dade County - Florida
Suite 900 - Brickell Plaza
909 S.E. First Avenue
Miami, Florida 33131
305/579-2827

Milwaukee: SEWRPC

Dr. Kurt W. Bauer, Executive Director

Mr. Keith W. Graham, Assistant Director

Southeastern Wisconsin Regional Planning Commission
916 No. East Ave.
Waukesha, Wisconsin 53186
414/547-6721

Minn.-St. Paul: Metropolitan Council

Mr. John Boland, Director

Mr. Roy Larsen

Information Systems Office
Metropolitan Council
300 Metro Square Building
7th and Robert Streets
St. Paul, Minnesota 55101
612/227-9421

NY, NJ, CT: Tri-State

Mr. Max Schwartz, Director

Mr. Lawrence B. Hammel

Information Division
Tri-State Regional Planning Commission
Floor 82, One World Trade Center
New York, NY
212/938-3349

NYS DOT

Mr. R. W. Tweedie, Director

Mr. Bill Lee

Data Services Bureau
New York State Dept. of Transportation
State Campus
1220 Washington Avenue
Albany, New York 12226
518/457-3768

Ohio DOT

Mr. Robert J. Zack

Mr. Archie W. Stanley, Jr.

Bureau of Urban Systems Planning
Ohio Department of Transportation
25 South Front St., Box 899
Columbus, Ohio 43216
614/466-2307

PennDOT

Mr. Lewis Keefer, Chief

Mr. Ray Sieman

Bureau of Advance Planning
Pennsylvania Department of Transportation
Harrisburg, PA 17120
717/787-5796

Philadelphia: DVRPC

Dr. Thabet Zakaria, Technical Director

Mr. James McNichol, Data Program Coordinator

Delaware Valley Regional Planning Commission
Penn Towers Building
1819 J.F. Kennedy Blvd.
Philadelphia, PA 19103
215/LO 7-3000

Phoenix: Maricopa Assn. of Gov'ts.

Mr. Arthur Auerbach
Transportation and Planning Office
Maricopa Association of Governments
206 South 17th Ave.
Room 309
Phoenix, Arizona
602/261-7867

Portland: CRAG

Mr. Richard Etherington, Transportation Director

Mr. Richard W. Hegdahl, Planner
Natural Resources Section

Columbia Region Association of Governments
527 Southwest Hall St.
Portland, Oregon 97201
503/221-1646

RI Statewide Planning

Mr. Roland J. Frappier, Supervising Planner
Statewide Planning Program
265 Melrose St.
Providence, RI 02907
401/277-2656

St. Louis: Ew Gateway CC

Mr. Robert Watson, Principal Transportation Planner
East-West Gateway Coordinating Council
112 N 4th St.
St. Louis, Missouri 63102
314/412-4220

San Diego: CPO

Mr. R. Ross Hall, Senior Regional Planner
Comprehensive Planning Organization of the San Diego Region
Suite 524
Security Pacific Plaza
1200 Third Ave.
San Diego, Calif. 92101
714/233-5211

San Francisco: MTC, ABAG

Ms. Pat Hackett

Ms. Marilyn M. Reynolds, BART Impact Data Manager

Metropolitan Transportation Commission
Hotel Claremont
Berkeley, CA 94705
415/849-3233

Mr. Denis Wamben, Regional Planner
Association of Bay Area Governments
Hotel Claremont
Berkeley, CA 94705
415/481-9730

Seattle: PSGC

Mr. Jim Lindsey
Research Division
Puget Sound Council of Governments
216 First Avenue South
Seattle, Washington 98104
206/464-7090, 7535

Spokane: SMATS

Mr. Wayne T. Gruen, Transportation Study Director
Spokane Metropolitan Area Transportation Study
Spokane Regional Planning Conference
353 City Hall
Spokane, Washington 99201
509/456-4325

Texas: SDHPT

Mr. Phillip L. Wilson, State Planning Engineer

Mr. John Waggoner

Mr. Eddie I. Shafie
Urban Planning Division
Texas Department of Highways and Public Transportation
Camp Hubbard
West 40th St. and Jackson Ave.
Austin, Texas
512/475-7266

Wash. COG

Mr. Robert Dunphy, Chief
Information Systems
Washington Metropolitan Council of Governments
1225 Connecticut Ave., N.W.
Washington, D.C. 20036
202/223-6800

BIBLIOGRAPHY

- California Department of Transportation; California Transportation Plan, (CALTRANS: Sacramento, Calif.), 1975.
- California Department of Transportation; ABG/MTC/DOH Joint Team; Description of 1965 Model Input Data: Working Paper #5, (CALTRANS), 1973.
- CALTRANS; "Census Data in Transportation Planning," (memorandum), 16 August 1973.
- CALTRANS; R. A. Lovelady; "Recommendations for 1980 Census Data Used in Transportation Planning" (prepared for Bureau of the Census), March, 1975.
- City Planning Commission, L. Lowell; "Economic Development Section," (memorandum: New York, N.Y.), 25 March 1975.
- City Planning Commission, E. Mann; "Journey-to-Work Data Needs Expressed at the March 20th Meeting," (memorandum: New York, N.Y.), 25 March 1975.
- City Planning Commission, S. Mandel; "1980 Census Journey-to-Work," (memorandum: New York, N.Y.), 17 March 1975.
- U. S. Department of Commerce, Social and Economic Statistics Administration, Bureau of the Census; 1970 Census Preliminary Evaluation Results Memorandum No. 51, (Washington, D.C.) 7 July 1975.
- COMSIS; Travel Forecasting Model Development Project, Appendix: Summary of Bay Area Data Base and Travel Models, 1974.
- COMSIS; "The Use of Census Data for Updating Urban Transportation Studies," (prepared for U.S. DOT, FHWA), 1974.
- Chicago Area Transportation Study, Aristide E. Biciunas; Letter to V.P. Barabba, Bureau of the Census, concerning "...requests for information from the U.S. Bureau of the Census and the U. S. Department of Transportation regarding experiences of local agencies with the 1970 Census to aid in the preparation for the 1980 Census," (Chicago, Ill.), 15 May 1975.
- Roger L. Creighton, Urban Transportation Planning, (University of Illinois Press, Chicago, Illinois) 1970.
- Creighton, Hamburg Planning Consultants, Data Requirements for Metropolitan Transportation Planning, National Cooperative Highway Research Program Report 120, (Washington, D.C.) 1971.
- John W. Dickey, senior author; Metropolitan Transportation Planning, (Scripta Book Co.: Washington, D.C., 1975)

- Delaware Valley Regional Planning Agency, Kevin O'Mara; "Recommendations for Improving the 1980 Census for Local and Regional Economic Base Statistics by Means of Additional Cross-Classification of Commutation Data," (Letter from Richard Forstall, Bureau of Census: Conn.), 24 May 1975.
- Kenneth Deuker; "Application of Information Systems Concepts to Transportation Planning," Highway Research Record Number 194, (Highway Research Board: Washington, D.C.) 1967.
- R. J. Fisher and A. B. Sosslaw; "Census Data as a Source for Urban Transportation Planning," Highway Research Record Number 141, (Highway Research Board: Washington, D.C.) 1966.
- Department of Planning, County of Orange, N.Y., Peter Garrison; Letter to Marshall Turner, U.S. Bureau of the Census, expressing concern that the journey to work question be maintained in 1980 Census, (Goshen, N.Y.), 19 March 1975.
- Department of Transportation, State of New Jersey, J. B. Gutberlet; Letter to E. F. Sullivan, Tri-State Regional Planning Commission concerning retention of journey-to-work information in 1980 Census, (Trenton, N.J.), 12 March 1975.
- Morris Hansen and Robert Voight; "Availability of Census Data for Urban Areas," Highway Research Record Number 194, (Highway Research Board: Washington, D.C.) 1967.
- Edgar Horwood; "Urban Information Systems and Transportation Planning," Highway Research Record Number 194, (Highway Research Board: Washington, D.C.) 1967.
- Paul Manka; A Description of the Concepts and Procedures Used in the 1970 Census Urban Transportation Planning Package Data Tabulations, (U.S. Department of Commerce, Social and Economic Statistics Administration. Bureau of the Census: Washington, D.C.), 1973.
- Federal Agency Council on the 1980 Census, FHWA Representative, James J. McDonnell; Letter to George Hall, chairman of the Federal Agency Council, concerning "1970 Census data items used and 1980 Census recommendations," (Washington, D.C.), 15 January 1975.
- Middle Rio Grande Council of Governments; Test and Evaluation of Data From the Standard Package of Census Data for Urban Transportation Studies (NTIS: Springfield, Virginia) 1973.
- Nassau-Suffolk Regional Planning Board, Pearl Kramer; "Journey to Work Tabulations for 1980 Census," (memorandum: Hauppauga, N.Y.), 3 April 1975.

- National Cooperative Highway Research Program; "Use of Census Data in Transportation Planning. Proposal Research Projects for NCHRP 1976 Program." (Washington, D.C.), 1975.
- Office of Midtown Planning, D. Lam; Letter to E. Mann, City Planning Department, concerning Midtown Planning position on Census Journey-to-Work. 7 May 1975.
- Peat, Marwick, Mitchel and Co.; A Review of Operational Urban Transportation Planning Models, (NTIS: Springfield, Va.) 1973.
- Peat, Marwick, Mitchel and Co., R.D. Worrall; Conceptual Design for An Urban Transportation Planning Information System; Executive Summary, Vol. I, Vol. II, (NTIS: Springfield, Va.) 1973.
- Port Authority of New York; "1980 Journey-to-Work -- A Port Authority Position Paper," (New York, N.Y.), 20 March 1975.
- Puget Sound Governmental Conference; Central Puget Sound Region Employment Estimates, 1970, (Seattle, Washington), 1972.
- Gerald F. Pyle; Applications of the DIME/GBF System: Akron, Ohio SMSA, (University of Akron: unpublished), 1975.
- Regional Plan Association, J. Zupan; "Regional Plan Association Statement in Support of 1980 Journey-to-Work Census Questions," (New York, N.Y.), 20 March 1975.
- Southeastern Wisconsin Regional Planning Commission; A Land Use-Transportation Plan for Southeastern Wisconsin -- Development and Applications of Planning Models, (unpublished), 1975.
- Spokane Metropolitan Area Transportation Study; Operations Plan, (Spokane Regional Planning Conference: Spokane, Washington), 1973.
- Spokane Metropolitan Area Transportation Study; Illustration of 1970 U.S. Census Data for the Spokane Urban Area; (Spokane Regional Planning Commission: Spokane, Washington), 1973.
- Robert Sword and Christopher Fleet; Updating an Urban Transportation Study Using the 1970 Census Data, Highway Planning Technical Report Number 30, (USDOT, FHWA: Washington, D.C.) 1973.
- Systems Design Concepts, Inc.; The Cooperative Transportation Planning Process in the Portland Metropolitan Area, Final Report of the Governor's Task Force on Transportation (Portland, Ore.), 1975.
- Texas State Department of Highways and Public Transportation; Amarillo Urban Transportation Study, The Development and Application of Trip Generation and Distribution Models 1964-1990, (Austin, Texas), 1975.

- Texas Transportation Institute; "Texas Trip Distribution Package," Summary Report 167-1 (S), 167-2 (S), (Texas A & M University: College Station, Texas), 1972.
- Texas Transportation Institute; "Texas Small and Large Network Packages," Summary Report 119-1 (s), 119-2 (s), 167-3 (s), 167-4 (s), (Texas A & M University: College Station, Texas), 1972.
- Texas Transportation Institute; "Accuracy of Trip End Estimates From the Home Interview Survey," Summary Report 167-7 (s), (Texas A & M University: College Station, Texas), 1973.
- Texas Transportation Institute; Accuracy of Travel Pattern Estimates From the Home Interview Survey," Summary Report 167-8 (s), (Texas A & M University: College Station, Texas), 1974.
- Texas Transportation Institute; "Urban Travel Forecasting," Summary Report 167-9F (s), (Texas A & M University: College Station, Texas), 1974.
- Transportation Research Board, "Use of Census Data in Urban Transportation Planning (Report of a Conference held July 9-10, 1970," Special Report 121, (Washington, D.C.) 1971.
- Transportation Research Board, "Census Data and Urban Transportation Planning (Report of a Conference held August 21-23, 1973)," Special Report 145, (Washington, D.C.), 1974.
- Tri-State Regional Planning Commission; "Journey-to-Work Requirements for the 1980 Census," (New York, N.Y.), 1975.
- Tri-State Regional Planning Commission; Local and Regional Government Census Tape Users Conference, (New York, New York), 1975.
- Tri-State Regional Planning Commission; The Worker File, (New York, N.Y.), 1973.
- Tri-State Regional Planning Commission; "Travel Demand Forecasting," Interim Technical Report 4527-1506, (unpublished: New York, N.Y.), 1975.
- Tri-State Regional Planning Commission; "A Model for Highway Needs Evaluation," Interim Technical Report 4157-2490, (unpublished: New York, N.Y.), 1969.
- Tri-State Regional Planning Commission; "Regional Population Forecasts: 1985 and Year 2000," Interim Technical Report 4333-2502, (unpublished: New York, N.Y.), 1973.
- Tri-State Regional Planning Commission; "Direct Traffic Estimation Method - A Distribution and Assignment Model," Interim Technical Report 2460-4159, (unpublished: New York, N.Y.), 1970.
- Tri-State Regional Planning Commission, J. Barry and L. Hummel; "Suggested Changes in the U.S. Census," (memorandum) 23 September 1974.

Tri-State Regional Planning Commission, Haden Boswell; "Census Urban Transportation Package," (memorandum), 7 July 1972.

Tri-State Regional Planning Commission, Lawrence V. Hummel; "Work Site Address Coding," (memorandum), 30 October 1973.

Tri-State Regional Planning Commission, L. Hummel; "October 10th Interview With Messrs. Stuart and McDonnel on Utility of 1970 Census Data in Urban and Transportation Planning," (memorandum), 30 September 1975.

Tri-State Regional Planning Commission, Efrain Lozada; "Census Recode Project - Final Report," (memorandum), 18 January 1974.

Urban Mass Transportation Administration, Office of Policy and Program Development, Program Evaluation Division; "The National Urban Transportation Reporting System," (unpublished: Washington, D.C.), September, 1975.

Alan M. Voorhees & Associates, Inc.; Statewide Data Needs Report, prepared for California Department of Transportation, (Berkeley, Calif.), 1975.

George V. Wickstrom, P.E.; 1980 Census Needs in Relation to Urban Transportation Planning (Metropolitan Washington Council of Governments: unpublished) 1974.

Thabet Zakaria; Analysis of 1970 Census Work Trips in the Delaware Valley Region, (Delaware Valley Regional Planning Commission, unpublished) 1974.

