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**Urban Transportation
Energy Conservation**

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SRGP Operating Instructions and Program Documentation

Volume V (of V)

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Assistant Secretary Policy and Evaluation
Washington, D.C. 20585

Urban Transportation
Energy Conservation

SRGP Operating Instructions and Program Documentation

Volume V (of V)

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16. Abstract
SRGP is a computer program for Short Range Generalized transportation Policy analysis for use in analyzing the energy conservation potential of a broad spectrum of transit, carpooling, vanpooling, parking, pricing and other transportation system management measures. It is intended for use in either an areawide or corridor context and in what is referred to as a "sketch planning" style of analysis. Outputs include changes in fuel consumption, vehicle emissions, vehicle miles of travel and modal shares for drive alone, shared ride, and transit. Changes in travel behavior are forecast relating to auto ownership, work trip mode choice, and the frequency, destination and mode choice for both shopping and social/recreational non-work travel. Using a random sample household forecasting procedure, SRGP is a modified version of the program UMODEL, distributed by the US Urban Mass Transportation Administration as part of UTPS, the Urban Transportation Planning System.

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Preface

The computer program capability described in this report was developed
for the U.S. Department of Energy as one part of a larger effort concerned
with the development of analytical methodologies for use in urban transpor-
tation energy conservation analyses. Other reports resulting from this
work are as follows:

Volume I   - Summary of Findings and Methodologies

Volume II   - Analytical Procedures for Estimation of Changes
               in Travel Demand and Fuel Consumption

Volume III - Case City Applications of Analysis Methodologies

Volume IV   - The Potential of Traffic Engineering Measures

The user of this Volume V reference manual is assumed to have a full under-
standing of the technical procedures described in Volume II and demonstrated
in Volume III.

In addition, SRGP was developed using the Urban Mass Transportation
Administration's Urban Transportation Planning System, UTPS. Certain
data files are defined in UTPS format, and a subset of UTPS utility routines
are utilized by SRGP in processing these files. Consequently, a general
understanding of UTPS also is useful in implementing and using SRGP.

The basic analytical capabilities incorporated in the SRGP computer
package were developed initially as part of a Federal Energy Administration
analysis of potential energy conservation related impacts associated
with increased carpooling. Subsequent major extensions have been under-
taken as part of the current Department of Energy contract, for the Metro-
politan Transportation Commission in San Francisco, for the U. S. Department
of Transportation, and as in-house research supported by Cambridge

Systematics, Inc. Cambridge Systematics, Inc., however, assumes sole responsibility for the contents of the program. While there are no known "bugs", neither Cambridge Systematics nor the sponsoring agencies can accept responsibility for any consequences resulting from the use of the program.

A number of individuals have contributed to the development of SRGP. William Jessiman and Moshe Ben-Akiva were responsible for the basic concepts and design, with subsequent implementation and extensions by Jeffrey MacMann, Terry Atherton and Earl Ruiter. Jeffrey MacMann is the principal author of the current version of the program, with major assistance provided by Richard Nestle, Terry Atherton and Douglas Bell. Applications of SRGP in San Francisco, Fort Worth, and Denver as part of this Department of Energy study were performed by John Suhrbier, Terry Atherton and Douglas Bell. This documentation has been prepared by Mr. MacMann and Mr. Nestle.

TABLE OF CONTENTS

I. INTRODUCTION

SRGP - SHORT RANGE GENERALIZED POLICY ANALYSIS

SRGP is a computer program for Short Range Generalized transportation Policy analysis. The term short range implies immediate and near run effects of transportation policies; generalized policy analysis conveys the features of the program that support the study of a broad spectrum of transit, carpooling, vanpooling, parking, pricing and other transportation system management measures that have a potential to contribute to urban transportation energy conservation.

SRGP represents one of a series of analytical methodologies developed for use by metropolitan planning organizations (MPO's) or state transportation agencies having a direct responsibility for the planning, design and implementation of transportation measures. It is intended for use in either an areawide or corridor context and in what is normally referred to as a "sketch planning" style of analysis. That is, estimates of policy results can be produced simply and quickly, prior to proceeding with detailed design. As such, SRGP supplements the full set of transportation network analysis capabilities available in most urban areas. For those areas desiring an even simpler form of travel demand analysis, yet one which is still based on calibrated demand models, a special non-computerized version of SRGP has been developed and is described in Reference 8. Using a set of worksheets and supported by an electronic desk calculator, this manual capability is demonstrated in Reference 7.

The SRGP computer program, in one run, can produce and summarize complete forecasts of all home-based transit and highway travel from input

data which describe households, base transportation levels of service, and population and employment activity distributions. A series of optional control statements are used to specify the effect of policy or other influences (like congestion) on the base service levels and activity distributions. Modes that can be examined for the work trip are drive alone auto, shared ride auto, transit and vanpool. In addition, policy effects on auto ownership; shared ride auto occupancy; shopping trip frequency, destination, and mode choice; and social/recreation trip frequency, destination, and mode choice are examined. SRGP reports many travel and travel-related impacts stratified by market and geographic segments; the program also can retrieve the results of a previous run for comparison with the current results.

Program input and output of standard urban transportation data is in a matrix format that permits direct interfacing with UMTA's UTPS software (References 2 and 3). This feature allows the program to support network analysis and/or to provide more detailed results for further examination by the user.

The internal methodology of SRGP involves a set of disaggregate household travel demand models and several ancillary models of auto fuel consumption, operating costs, and emissions. These are applied to a sample of individual households provided in a program input file. The program has features for optionally expanding the results in any manner which is appropriate to the area population.

Considerable effort has been expended to ensure that the SRGP program described in this manual performs correctly and according to specifications.

Initial development, testing, and usage were on data representing

Washington, DC and Birmingham, Alabama. As part of the current Department

of Energy work, the program has been adapted to and applied in San

Francisco, California; Fort Worth, Texas; and Denver, Colorado. As a

result, the program has been run many times in applications representa-

tive of several different regional settings, and at the time of this

writing there are no known "bugs". Nevertheless, because the program

is quite complex and continuously evolving, neither its sponsors nor its

authors can accept responsibility for any consequences of its use.

REPORT PURPOSE AND STRUCTURE

This document serves as a reference guide to the SRGP program and is

intended for use by persons operating the program and also by programmers

with an interest in making modifications to SRGP input or output processing.

Chapter II describes the interface between SRGP and the UTPS computer

package, and specifically its UMODEL program, supported by the Urban Mass

Transportation Administration. To provide a basic understanding of each

of the program's input and output related files, these information datasets

are defined and discussed in Chapter III. Instructions for operating

the program are provided as Chapter IV, including a set of tables that

can serve as a user reference guide. Chapter V is oriented to those persons

responsible for installing or modifying SRGP. While examples are included

throughout the text, a separate and complete example run is provided as

Chapter VI to facilitate a person's introduction to SRGP. While the

report normally will be utilizied primarily as a reference, the "first

time" user should review the entire report initially, then review the

last section of Chapter II which summarizes key features of SRGP's organ-
ization and operation, and then return to a more in-depth analysis of
Chapters III and IV.

The Bibliography contains a list of source material which is relevant
but beyond the scope of this manual. Reference numbers appear in the
text where appropriate. This report specifically does not cover either
the theory or the development of the various models and submodels incor-
porated in SRGP. A unified presentation of the theory and method of SRGP
is given in Reference (1), which is Volume II of this report series.
Reference (6) is the most complete source of information about the individual
travel demand models. It is essential that the reader be familiar with
some of this background information, not only to provide a context for
this documentation but also to use the program effectively.

SRGP is implemented on the IBM 370 series of computer and operates
under the OS monitor. The user of this manual also is assumed to be familiar
with basic OS/370 concepts.

II. USE OF SRGP WITH OTHER URBAN TRANSPORTATION PLANNING SOFTWARE

SRGP is a modified version of the program UMODEL, distributed by the
Urban Mass Transportation Administration as part of UTPS, the Urban Trans-
portation Planning System (2). The UMODEL setting serves to impose a
user-oriented structure on SRGP and to provide standardized input and
output facilities for communication with other UTPS programs. The input
data are specified in such a way that they can be easily produced from a
typical household interview survey and normal network analysis techniques.
Alternative sources of data, such as the U.S. Census of the Population,
have been used successfully. For an example, see Reference (7).

UTPS

UTPS was developed by UMTA and is an easy-to-use but powerful and
methodologically sophisticated computer system in wide use today by metro-
politan planning organizations (2,3). Ths system offers integrated faci-
lities for highway and transit network supply and equilibrium analyses, for
travel demand model calibration and application, and for general (matrix)
data utility functions. UTPS is an important part of the SRGP operating
environment: UTPS network and matrix software can be used to create the
input non-work level of service files J1--J7 described in the next chapter; and
SRGP's output trips and emission files (see next chapter) are in UTPS
standard matrix format. And while the work purpose level of service data
on the HH/WORK file (see next chapter) are not in UTPS format, the UTPS
programs can be used to create the original data before it is reorganized

(by the user) into SRGP format.

UMODEL

One of the several functions of the UTPS program, UMODEL, is to provide a general framework for travel demand model application (4). The program has broad user-oriented input and output capabilities and a central subroutine, MODE13, which receives all the input data and produces all the output data. In addition, this subroutine may be written by a user to execute a demand model and SRGP has been implemented in this fashion, although SRGP is in fact many individual models and subroutines which are called from MODE13.

References (3) and (4) contain complete documentation of UMODEL, which the reader is urged to consult for a fuller understanding of the UMODEL features used by SRGP. The reader is cautioned that only the specific aspects of UMODEL that are listed below and discussed elsewhere in this manual are applicable to SRGP:

- Non-Work Level of Service Matrix File Input (J1--J7 Files)

- Zone Data File Input (A1--A7 Files)

- Trip and Emissions Matrix Output (J9 File)

- UMODEL Control Statements

While SRGP was designed and developed within the UTPS framework, it can be executed as a stand-alone program, if desired, and run independently of any other components of UTPS because all UTPS utility routines needed are contained directly in the program as delivered. However, preparation of the input data and processing of the output data will be greatly facili-

tated by the use of UTPS programs which manipulate matrix data, produce level of service data from networks, and format matrix data. Thus it is recommended that the user be familiar with References (2) and (3) and either install or have access to UTPS (available through the UMTA office given in References (2) and (3)).

PREPARING TO USE SRGP

When actually preparing to use SRGP, the user should decide which models he or she needs to run. If the Auto Ownership (AO) model results are desired, then all the other models must be run as well. If the AO models are not going to be run, then any of the other model travel purposes may be run alone: work, shop or social-recreational. If work only is needed, or conversely, if work is not needed, then significant economies will be possible in data development and/or SRGP execution. The choice of which model or models to run depends on the kinds of policies to be analyzed and the impacts that are of particular interest.

Input data files need to be prepared only for those models selected to be used. (Tables IV-11 to IV-14 show the correspondence between models and data.) In general, the household segments of the HHWORK file are always required, although some of the individual variables may be ignored (set to dummy values) if some of the models will not be run. The work segments in the HHWORK file are only required if the work models are going to be executed. The non-work level of service data (J1--J7 files) are only required if either the shop or social-recreational models are going to be run. Most of the variables in the zone data files A1--A7 pertain only to a subset of the models; the second section of Chapter IV and Table IV-2 discuss how to suppress input for zone variables that are not needed.

The household segments of the HHWORK file usually are extracted from a home interview travel survey. Samples of between 500 to 2000 households are typical. If work segments are required for the work models then the worker attributes also come from the survey. Work trip level of service will originate in UTPS files (or other standard formats) which must be prepared exogenous to SRGP from networks, etc. The user will need to write a program to collate the household, worker, and work trip data and produce the SRGP-format HHWORK file. An example of this is provided in Reference (7).

The non-work level of service matrices (J1--J7) remain in standard UTPS format for input to SRGP. If required, they would be developed from networks too. If the user's network analysis system is not UTPS (for example, if it is the Federal Highway Administration system PLANPAC), then the UTPS program UMCON can be used to translate the data into UTPS format for input to SRGP.

The zone data format (for the A1--A7 files) is left largely up to the user. If there are any pre-existing files which contain the required zone information then usually they can be processed "as is" by SRGP. In other cases it is sufficient for SRGP input data to be coded and key-punched on to one or more cards for each zone. In general, a zone data input file must always be provided; however, if any of the travel models are not being run, then it will be possible to suppress some of the data items.

The user is cautioned that the data base should be thoroughly checked before using with SRGP. Because of the sheer magnitude of the data base

when all the models are being used and when the data pertain to a large region combined with the high cost of data checking, SRGP performs only minimal checking or editing of the input data. The only data problems which can be detected by SRGP are in general those which are so severe that they would cause computational errors, for example division by zero or precision loss.

A final step to be undertaken before actual production analysis of candidate measures can be performed is the adjustment of the individual travel demand models contained within SRGP to fit the unique base case travel patterns of the region. This recalibration procedure (accomplished primarily via the &CMODEL control statement) is beyond the scope of this reference manual, but is discussed in detail as part of Reference (7).

III.   FILE INFORMATION

The input and output files used or produced by SRGP are summarized in Table III-1.   This chapter describes each of these files, and is organized by the file names shown in the table.

JSYSIN (FT01F001) -- SRGP CONTROL INPUT

This file is composed of "notes" cards and Namelist control statements in 80-byte card-image format, the last eight bytes reserved for sequence (line) numbers.   "Notes" cards are free format text of any number of lines for user documentation purposes which are listed on the printer during program execution.   The Namelist statements are used for SRGP program control and for representation of policy to the model system.   The JSYSIN (FT01F001) control statements are discussed in detail in Chapter IV.

HHWORK (FT03F001)--HOUSEHOLD/WORK TRIP INPUT

This user-supplied file describes a sample of households and their associated work trips.   The HHWORK file contains one variable-length unformatted record for each household in the sample, composed of a household segment and as many work trip segments as there are workers making work trips on the modelled day (usually a survey day).   The record format is given in Table III-2.   The file contains one record for each sample household, composed of a household data segment (Table III-2A) and a variable number of work trip segments (Table III-2B).   All data are unformatted halfword integers except the HHID, which is 6 bytes in EBCDIC.   (The HHID is an arbitrary code used only for reference in printed messages.)

Table III-1

File Summary

FILE NAME	DDNAME	CONTENTS OR FUNCTION
JSYSIN	FT01F001	SRGP control input 　　1. "Notes" cards 　　2. &SRGP 　　3. &OPTION 　　4. &CMODEL 　　5. &POOLS 　　6. Update statements 　　　　a. &UZONE 　　　　b. &UHH 　　　　c. &UWORK 　　　　d. &UPLAY
HHWORK	FT03F001	Household/Worker/Work Trips Input
BASEI	FT09F001	Input base impact file
BASEO	FT10F001	Output impact file
A1-A7[1]	A1, A2...A7	Zone data inputs
J1-J7[1]	FT11F001- FT17F001	Non-Work LOS input matrices
J9[1]	FT19F001	Trips and emissions matrix outputs
SYSIN[1]	FT05F001	UMODEL control input 　　1. "Title" card(s) 　　2. &PARAM 　　3. &SELECT 　　4. &EQUIV 　　5. &DATA 　　6. Variable ID Cards
SYSPRINT	FT06F001	Print output (program reports and messages)
	FT02F001 FT20F001 FT22F001	Scratch space
—	FT21F001	UTPS Log (may be dummied)

[1]UMODEL files. See References (3) and (4) for more information.

The HHWORK file must be in ascending sort on the home zone field.

The first item, LRECL, in the household segment gives the number of halfwords in the entire remaining record, counting three for the HHID, and including any and all work segments. The value of LRECL for a household with $\underline{N}$ work segments is (14 + 16*N).

The household segment contains four expansion factors which are used as weights on the associated impacts calculated by the program:

HXFCTR -- Applies to household attributes and auto ownership model reulsts;

WXFCTR -- Applies to worker/work trip attributes and work travel model results;

SXFCTR -- Expands shop travel model results;

RXFCTR -- Expands social-recreational travel model results.

These factors are applied to the household's attributes and travel impacts before they are entered in the impact report tables (see SYSPRINT (FT06F001) file below. The factors also are used to expand the output trip and emissions tables on the J9 file.

The Work Trip segments, if present, immediately follow the HH segment.[1] There are as many work segments as implied in the LRECL item at the beginning of the HH segment, i.e., N=(LRECL-14)/16 (not necessarily equal to "NWORK"). There is one such segment for each household worker who made a home-to-work trip on the survey date, up to a maximum of 10 segments.

If the Auto Ownership model is to be run with this file, then a breadwinner work trip must be included for any household with workers. In the event the breadwinner did not make his or her usual work trip on the survey date, a dummy work segment is indicated by the BW variable set to -1 (see note 3, Table III-2B).

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[1]The work segments need be present only if the work trip models are being run, signified by WORK=T on the &OPTION statement. However, if a data set has been prepared complete with work segments, they need not be eliminated in order to use the file when WORK=F.

TABLE III-2A

INPUT HHWORK FILE FORMAT				
HOUSEHOLD SEGMENT FORMAT				
NAME	&UHH FIELD[1]	BYTES	SCALE	DESCRIPTION
LRECL	–	1,2	–	Length of rest of record in halfwords
HHID	–	3-8	–	Household ID
HHZONE	–	9,10	–	Home zone
HHSIZE	1	11,12	–	Number of persons in HH
INCOME	2	13,14	($/yr)/10	Annual HH total income in 1965 $
NWORK	3	15,16	–	Number of HH workers
DUTYPE	4	17,18	–	Dwelling unit type (=1 or $\neq$ 1)[3]
BASEAO[2]	5	19,20	–	Observed HH auto ownership
BASEAR[2]	6	21,22	–	Observed HH autos remaining after work trips
HXFCTR[4]	7	23,24	units	Household expansion factor
WXFCTR[4]	8	25,26	units	Work trip expansion factor
SXFCTR[4]	9	27,28	units	Shop trip expansion factor
RXFCTR[4]	10	29,30	units	Soc.-Rec. trip expansion factor

Notes

[1] The "field" numbers correspond to "ADD" and "FAC" indices in &UHH and &UWORK control statements, which are discussed further in Chapter IV.

[2] BASEAO and BASEAR are used by SRGP only if AO=F on the &OPTION statement, i.e., the auto ownership model is not in effect.

[3] The dwelling unit type is used only to distinguish single family dwelling (type = 1) from other types (type $\neq$ 1).

[4] The development of these expansion factors is discussed in Reference (1).

TABLE III-2B

INPUT HHWORK FILE FORMAT				
WORK TRIP SEGMENT FORMAT				
NAME	&UWORK FIELD[1]	BYTES[2]	SCALE	DESCRIPTION
BW	1	31,32	–	Breadwinner Key:[3] = 1 if breadwinner trip = 0 if not breadwinner trip = -1 if represents a breadwinner trip not made on the travel day
QAAC2	2	33,34	–	Auto access to bus dummy: = 1 if access is by auto = 0 if access is by walk
QWALK	3	35,36	mins.	Transit walk time, round trip total
VONTIM	4	37,38	mins.	Drive alone on-vehicle time, round trip total[6]
QONTIM	5	39,40	mins.	Transit on-vehicle time, round trip total including access auto on vehicle time if access to transit is by auto[4]
QHDWY	6	41,42	mins.	Headway of first transit vehicle summed over both directions
QXFER2	7	43,44	mins.	Sum of one half of all the transfer headways, summed for both directions
VTOLLW	8	45,46	cents	Round trip drive alone tolls (1965 values)
VDISTW	9	47,48	miles*10	Round trip drive alone distance
QFARE	10	49,50	cents	Round trip transit fare, excluding auto.access costs.(in 1965 values)
QDIST	11	51,52	miles*10	Round trip auto access to transit distance
QPARK	12	53,54	cents	Round trip auto access to transit park cost (in 1965 values)
SONTIM	13	55,56	mins.	Shared ride on-vehicle time, round trip[4] including any circuity which may be caused by diverting to pick up a passenger.
STOLL	14	57,58	cents	Shared ride per-vehicle toll, round trip (in 1965 $)
SDIST	15	59,60	miles*10	Shared ride auto distance, round trip
ZWORK	–	61,62	–	Work zone

TABLE III-2B (continued)

Notes

1. The "field" numbers correspond to "ADD" and "FAC" indices in &UHH and &UWORK control statements, which are discussed further in Chapter IV.

2. Work segment byte locations are shown for the first work trip segment. The second work trip's Breadwinner key would be in bytes 63,64 and its ZWORK in bytes 93,94, etc. In general, the $\underline{N}$'th work segment Breadwinner key begins on byte 31 + (N-1)*32.

3. For each household, one worker is designated as the breadwinner (primary worker), and all other workers are denoted as secondary workers. The rules used to select the breadwinner are the following:

   - If only one worker reports full-time employment, then he/she is the breadwinner.

   - In other households with multiple workers, the worker making the largest number of home-based trips on a weekly or other periodic basis is the breadwinner.

   These rules are developed for use with home interview surveys that typically distinguish a "head of household". If the rules cannot be followed precisely, the user should exercise his/her best judgement as to the breadwinner in a household using whatever information is available. For example, the oldest worker could be designated the breadwinner, or alternatively, the worker with the "highest status" job could be selected, if worker occupations are known.

   The breadwinner work trip attributes also enter the auto ownership calculations. A breadwinner code of -1 indicates that this trip is to be used only in computing auto ownership. If will <u>not</u> be factored up and reported as a work trip on the day being modelled. The segment should describe the breadwinner's usual work trip--if known.

4. The modal on-vehicle times are used to determine mode availability: if the on-time for a mode is less than or equal to zero, the mode is not available.

BASEI, BASEO (FT09F001, FT10F001)--IMPACT FILES

Under control of the RDBASE and WRBASE parameters of the &OPTION

statement (see Chapter IV), SRGP will retrieve via BASEI the impact

results of a former run for comparison with this run and/or will store

via BASEO the current run results. (These files are unformatted; they are

created by SRGP and intended to be read only by SRGP. Since they are

logically similar to the printed impact reports, their format is not

given here.)

A1-A7--ZONE DATA INPUTS

From one to seven "A-files" may be supplied by the user to in-

put an assortment of zonal variables for the travel models and some for

program control. These files contain fixed-length (up to 1024 bytes long)

EBCDIC records, one for each zone. The number and field-format of the

files is at the user's convenience, and which is indicated on the UMODEL

Variable ID Definition cards (see SYSIN (FT05F001)--UMODEL CONTROL INPUT

below and Chapter IV). All data fields are interpreted as floating

point numbers; if a decimal point is not explicitly coded in a field,

it is assumed to lie immediately at the right of the field. The zone

variables are defined in Table III-3.

J1-J7 (FT11F001 - FT17F001)--NON-WORK LEVEL-OF-SERVICE INPUT MATRICES

These files supply five UTPS-format zone-to-zone matrices of off-peak

level-of-service for both transit and auto, which provide data for the

shopping and social-recreational travel models. Any or all of the files

J1 through J7 may be used for this purpose and indicated on the UMODEL

TABLE III-3

Zonal Variables

NUMBER	SRGP NAME	DESCRIPTION	UNITS	NOTES
1	CBD	CBD dummy =(1 if CBD zone, = 0 if otherwise)	–	–
2	HHLOC	Household location for reports (= 1, 2, or 3) where 1 = urban, 2 = suburban, 3 = exurban	–	–
3	RJOBS	Retail Employment	–	3
4	SJOBS	Service Employment	–	4
5	ACRES	Total Acres	–	5
6	PACRES	Population-serving acres	–	6
7	POP	Population	–	6
8	VPRKWO	Round trip peak auto drive alone park cost/auto for zone as home	cents	6
9	VPRKWD	Round trip peak auto drive alone park cost/auto for zone as destination	cents	6
10	VWLKWO	Round trip peak auto drive alone walk time - home	mins.	1
11	VWLKWD	Round trip peak auto drive alone walk time - destination	mins.	2
12	VPRKSO	One-way off-peak auto park cost/vehicle for zone as home	cents	6
13	VPRKSD	One-way off-peak auto park cost/vehicle for zone as destination	cents	6
14	VWLKSO	One-way off-peak auto walk time - home	mins.	1
15	VWLKSD	One-way off-peak auto walk time - destination	mins.	2
16	SPRKWO	Round trip peak auto shared ride park cost - home	cents	6
17	SPRKWD	Round trip peak auto shared ride park cost - destination	cents	6
18	SWLKWO	Round trip peak auto shared ride walk time - home	mins.	1
19	SWLKWD	Round trip peak auto shared ride walk time - destination	mins.	2
20	ZCPOOL	Proportion of work trips attracted to the zone which have a carpooling option available		
21	ZVPOOL	Proportion of work trips attracted to the zone which have an vanpooling option available		
22	–	"ZONE NUMBER"		

Notes for Zonal Variables - Table III-3

1. _WLK_O variables are walk time from home to car plus car to home on the return trip.

2. _WLK_D variables are walk time from car to destination plus destination to car on the return trip.

3. Retail employment is defined as SIC codes 53-59 which cover:

   - retail general merchandise
   - food stores
   - automotive dealers and service stations
   - apparel and accessory stores
   - furniture and home furnishings
   - eating and drinking places
   - miscellaneous retail stores

4. Service employment is defined as SIC codes 70-89 which cover:

   - hotels
   - personal services
   - auto repair
   - miscellaneous repair
   - motion pictures
   - amusement
   - medical
   - legal
   - nonprofit
   - private households
   - miscellaneous business services
   - educational services
   - museums, botanical, zoological gardens
   - miscellaneous services

5. Population serving acres is defined as that area which is not devoted to agriculture (SIC codes 1, 7-14), manufacturing (19-39), and trade (50, 52), and which is devoted to retail (53-59), service (70-89) and "other", retail and service are defined above. "Other" consists of:

   40, 42, 44, 45, 46 - long distance transportation
   62, 63, 67 - National finance and insurance
   91, 92 - Federal and state government
   15, 16, 17 - construction
   41, 47, 48, 49 - Transportation, communication, utilities
   60, 61, 64, 65, 66 - Finance, insurance, and real estate

   It can be approximated as total acres times the ratio of retail, service, and other employment over total employment.

6. All costs are in 1965 terms.

Variable ID Cards (see SYSIN (FT05F001)--UMODEL CONTROL INPUT below and

Chapter IV). The non-work level-of-service data, described in Table III-4,

should be in either 2-byte or 4-byte matrix format. These files are not

required if the non-work models are not being run (i.e., SHOP = F and SR =

F on the SRGP &OPTION statement described in Chapter IV).

J9 (FT19F001)--TRIPS AND EMISSIONS MATRIX OUTPUTS

The SRGP-estimated trips and auto emissions may be output on this file

in UTPS-format zone-to-zone matrices, as directed by the user with the "O-

table" keywords on the &SRGP Namelist statement described in the next chapter.

SYSIN (FT05F001)--UMODEL CONTROL INPUT

This file contains UMODEL control statements, prefaced by any number of

'Title' cards, the first of which is used for UMODEL's page headings. The

operative control statements are the &PARAM, &SELECT, and &EQUIV Namelists,

followed by the &DATA delimiter and the Variable ID Cards. These control

statements are discussed in the next chapter.

SYSPRINT (FT06F001)--PRINT OUTPUT

The print file contains a variety of program messages and reports.

In the first few pages, the program documents all control information

by first printing the card-image control statements from the SYSIN and JSYSIN

files, then showing the interpreted control parameters as input or their de-

fault values. Next there appears a summary of the file characteristics of

each of the UMODEL "A-files" and "J-files". Then appears a listing of the

UMODEL Variable ID Cards after the &DATA statement in the SYSIN input file.

TABLE III-4

Non-Work LOS Input Matrices

All data are one-way. All costs are in 1965 values.

SRGP NAME	DESCRIPTION	UNITS
VTIME	Auto in-vehicle time	mins.
VDISTS	Auto distance (1)	mi.*10
VTOLLS	Auto tolls	cents
QTIME	Transit total door-to-door time (2)	mins.
QFARES	Transit fares	cents

Notes:

1. $VDISTS_{ij}$ = total door-to-door auto distance

$\quad$ = auto $distance_{ij}$ + access $dist_i$ + access $dist_j$

$\quad$ where access $dist_i$ = ave. dist for ORIG zone from home to coded network
$\quad\quad$ access $dist_j$ = ave. dist for DEST zone from coded network to final destination

2. $QTIME_{ij}$ = total door-to-door transit time
$\quad$ = transit $time_{ij}$ + park $time_i$ + park $time_j$ + access $time_i$ + access $time_j$ + wait $time_{ij}$ + transfer $time_{ij}$

Following the Variable ID Cards, the input zone data files (A1-A7) will be printed if the user has coded REPORT = 1 on the SYSIN file &SELECT statement.

After the zone data is printed, SRGP proceeds to read through the HHWORK file to forecast travel for the households. During this phase, messages may be printed to indicate anomalies found in the input data.

When all households have been processed, SRGP reports summaries of numerous "impact" variables stratified by market segments, i.e., household types. Total and average impacts are reported, and if RDBASE = T on the SRGP HSYSIN file &OPTION statement (see Chapter IV) and if the BASEI file is defined, then the program prints a table of impact changes, as percentages relative to the "base" run. A "dictionary" of impact variables, market segments, and report types is printed as a key to the tables. Examples of these "dictionaries" are shown in Tables III-5 and III-6. Chapter VI contains complete example outputs from SRGP. All the printed results are weighted by the corresponding household specific expansion factors in the HHWORK input file before they are entered in the tables.

To conclude the run, SRGP reports the average transport level-of-service variables for each mode and trip purpose, stratified by the same household market segments as the impact tables.

Table III-5.

DESCRIPTION OF IMPACT VARIABLES

LABEL	DESCRIPTION

(HOUSEHOLD)

NHH	NUMBER OF HOUSEHOLDS
INCOME	HOUSEHOLD INCOME
NPER	HOUSEHOLD SIZE (NUMBER OF PERSONS)
AO	HOUSEHOLD AUTO OWNERSHIP
NWORK	NUMBER OF WORKERS

(WORK TRIP)

NWRK TRP	NUMBER OF WORK TRIPS
DR ALONE	NUMBER (OR MODESHARE) OF DRIVE ALONE
SHARED	NUMBER (OR MODE SHARE) OF SHARED RIDE
TRANSIT	NUMBER (OR MODE SHARE) OF TRANSIT
VANPOOL	NUMBER (OR MODE SHARE) OF VANPOOL
POOLS	NUMBER OF CARPOOLS AMONG SHARED RIDERS
VEH TRIP	AUTO VEH TRIPS IN DRIVE ALONE AND SHARED RIDE
DIST	WORK TRIP LENGTH USING DRIVE ALONE DISTANCE FOR ALL THREE MODES
WORK VMT	VEHICLE MILES BY DRIVE ALONE AND SHARED RIDE
WRK FUEL	FUEL CONSUMMED ON WORK TRIPS (GALLONS/DAY)
WORK HC	WORK TRIP HYDROCARBON EMISSIONS (KG)
WORK CO	WORK TRIP CARBON MONOXIDE EMISSIONS (KG)
WORK NOX	WORK TRIP NITROGEN OXIDE EMISSIONS (KG)

(NON-WORK TRIPS)

SHP TRIP	NUMBER OF SHOP PERSON TRIPS
SRP TRIP	NUMBER OF SOCIAL/RECREATIONAL PERSON TRIPS
SHV TRIP	NUMBER OF SHOP VEHICLE TRIPS
SRV TRIP	NUMBER OF SOCIAL/RECREATIONAL VEHICLE TRIPS
DIST	AVERAGE ONE-WAY DISTANCE (MILES)
NW VMT	VEHICLE MILES TRAVELLED
NW FUEL	FUEL CONSUMMED ON NW TRIPS (GALLONS/DAY)
NW HC	NW TRIP HYDROCARBON EMISSIONS (KG)
NW CO	NW TRIP CARBON MONOXIDE EMISSIONS (KG)
NW NOX	NW TRIP NITROGEN OXIDE EMISSIONS (KG)

(TOTAL)

TOT VMT	TOTAL VEHICLE MILES TRAVELED
FUEL CON	TOTAL FUEL CONSUMMED (GALLONS/DAY)
HC POLL	TOTAL HYDROCARBON EMISSIONS (KG)
CO POLL	TOTAL CARBON MONOXIDE EMISSIONS (KG)
NX POLL	TOTAL NITROGEN OXIDES EMISSIONS (KG)
CBD VEH	NW VEHICLE TRIPS TO CBD
CBD PER	NW PERSON TRIPS TO CBD

Table III-6

DESCRIPTION OF MARKET SEGMENTS

LABEL	DESCRIPTION
LOW INC	HOUSEHOLDS WITH ANNUAL INCOME LESS THAN $7500
MID INC	HOUSEHOLDS WITH ANNUAL INCOME $7500 - $15000
HIGH INC	HOUSEHOLDS WITH ANNUAL INCOME GT $15000
URBAN RZ	HOUSEHOLDS RESIDING IN URBAN AREAS
SBURB RZ	HOUSEHOLDS RESIDING IN SUBURBAN AREAS
EXURB RZ	HOUSEHOLDS RESIDING IN EXURBAN AREAS
AO=0	HOUSEHOLDS WITH ZERO AUTOS AVAILABLE
AO=1	HOUSEHOLDS WITH ONE AUTO AVAILABLE
AO=2	HOUSEHOLDS WITH TWO OR MORE AUTOS AVAILABLE
TOTAL	ALL HOUSEHOLDS

DESCRIPTION OF REPORTS

TOTAL IMPACTS: VALUES OF VARIABLES AS ACCUMULATED USING
APPROPRIATE EXPANSION FACTORS

AVERAGE VALUES: THIS REPORT DIVIDES THE VALUES REPORTED
IN THE TOTAL IMPACTS REPORT BY THE TOTAL OF THE
APPROPRIATE EXPANSION FACTORS BY MARKET SEGMENT. IN THE
CASE OF THE COMBINED WORK AND NON-WORK TOTALS THE
AVERAGING TOTAL USED IS THE SUM OF THE HOUSEHOLD
EXPANSION FACTORS. THIS RESULTS IN A HOUSEHOLD AVERAGE
FOR THESE IMPACTS.

PERCENTAGE CHANGES FROM BASE: THIS REPORT (PRINTED ONLY
IF RDBASE=T) GIVES THE PERCENT CHANGES OF THE IMPACTS
OF THE RUN RELATIVE TO A BASE SET.

IV. PROGRAM OPERATION--USER REFERENCE

This chapter defines the program control statements, which provide both the means to run SRGP in a mechanical sense, and to represent transportation policy for the purposes of policy analysis.

There are two program control files, SYSIN and JSYSIN. The SYSIN file contains UMODEL control statements; the JSYSIN file contains SRGP-specific control statements.

UMODEL/SYSIN CONTROL STATEMENTS

Namelist Control Statements

The &PARAM, &SELECT, and &EQUIV statements are in standard IBM Namelist format. The &PARAM statement is mandatory; the others are optional. Table IV-1 describes the statement keywords.

The &PARAM statement must provide the value of the ZONES keyword which defines the number of traffic zones being used.

The &SELECT statement is used to select origins (household zones) for UMODEL/SRGP processing via the 'I' keyword, and/or to request the zone data report. If these functions are not desired, the &SELECT statement may be omitted. If used, the &SELECT statement must follow the &PARAM statement.

The &EQUIV statement is used to assign a district number to a group of zones which will be treated alike by the policies (or other forces) represented on the SRGP Update statements (see below). As many &EQUIV statements as needed may be included, each one defining a district and its associated zones; more than one &EQUIV statement can refer to the same district, in which case the union of the zones assigned to the district on all such statements is indicated.

TABLE IV-1

UMODEL Keywords

These are the UMODEL SYSIN control statements and variables which are operational with JSRGP. See the UTPS Reference Manual and the UMODEL program writeup for further explanation.

	KEYWORD	TYPE	DEFAULT	MAX	PURPOSE
&PARAM	ZONES	I	0	2500	Number of zones in shop/SR and/or work data
	DISTS	I	0	100	Number of districts in &EQUIV Definitions
&SELECT	I	I(200)	I=1, -ZONES	–	List of origin zones to be processed
	REPORT	I	0		Controls zonal data echo print (REPORT=1) and may also be used to print the output matrices
&EQUIV	DIST	I	0	DISTS	District number
	Z	I(200)	0	–	List of zone numbers and zone number ranges of 'DIST'
	SAME	I(200)	0	–	List of zone numbers and ranges whose district numbers are the same as their zone numbers

The &PARAM keyword DISTS must be coded to the maximum district number named on the &EQUIV cards. Up to 100 districts are allowed. The sole purpose of the &EQUIV statements is to supply district definitions for the SRGP Update statements. &EQUIV statements are placed after the &PARAM and &SELECT statements.

Variable ID Cards

These UMODEL control cards name and locate the input zone and non-work level of service (LOS) data. The Variable ID Card formats are shown in Tables IV-2 and -3. The Variable ID Cards must be delimited from the preceding control cards (&PARAM, &SELECT, &EQUIV) by the &DATA card, which is not a true Namelist but merely a card with columns 2-6 containing '&DATA', column 1 and 7-80 blank.

The first 19 zone data ID cards are mandatory. However, except for the first two variables, CBD DUMMY and the impact report district, the other variables are model-specific; that is, they are used by only a subset of the models, and these variables need not be input if the corresponding models are not being run (see &OPTION statement below). In order to suppress a zone variable input, an asterisk is placed in column 6, and columns 7 through 17 and 22 must be left blank. See Table IV-11 to determine which variables enter which models.

Table IV-2

UMODEL Zone Data Variable ID Cards

CARD COLUMNS							
2,3 ID Number	5 Type	6 Input Suppression Indicator	9-12 Start Location	14-17 End Location	19-20 Zone Variable Number	22 A File	37-60 Name, etc.
1	A	(Blank	First	Last	1	Number	CBD
2	A	indicates	byte	byte	2	of	HHLOC
3	A	actual	(card	of data	3	A-File	RJOBS
4	A	input	column)	field	4	contain-	SJOBS
5	A	variable.)	of data	in	5	ing	ACRES
6	A		field	A-File	6	field	PACRES
7	A	Asterisk	in	record.	7		POP
8	A	('*')	A-File		8		VPRKWO
9	A	suppresses	record.		9		VPRKWD
10	A	input.			10		VWLKWO
11	A				11		VWLKWD
12	A	Columns			12		VPRKSO
13	A	9-17 and			13		VPRKSD
14	A	22 must			14		VWLKSO
15	A	be left			15		VWLKSD
16	A	blank if			16		SPRKWO
17	A	'*' in			17		SPRKWD
18	A	column 6.			18		SWLKWO
19	A				19		SWLKWD
(20)	A				(20)		(ZCPOOL)
(21)	A				(21)		(ZVPOOL)
22	A				22		ZONE NUMBER

Columns 2,3 and 5 should be coded as shown; the A in column 5 indicates a zone variable.

Variables 20 and 21 should only appear if the &POOLS control statement is used in the SRGP JSYSIN file to invoke employer-based carpool policies (see below). If they are omitted, the ZONE NUMBER variable should be number 20.

Except for variables 20 and 21, all other data ID cards are mandatory. But, with the exception of 1,2, and ZONE NUMBER, the remaining variables are model-specific and only need be input if their corresponding model(s) are being run. In order to suppress input for a zone variable, its data ID card must still be included, but with an asterisk in column 6, and columns 9-17 and 22 blanked out.

When an asterisk is not in column 6, columns 9-17 and 22 define the source of each variable. Column 22 gives the number of the A-file containing the variable, and 9-17 indicate the field containing the variable on each record of the A-file. Up to seven A-files may be referenced, each one containing one or more of the variables, at the user's option.

Columns 19-20 must be coded as shown. Again, if variables 20 and 21 are omitted, then ZONE NUMBER should be "moved up" to number 20.

(Table IV-2, continued)

The contents of 37-60 are entirely arbitrary except for ZONE NUMBER. The names shown are the standard names used throughout this manual. The variables are defined in Chapter III, Section D, and Table III-3. The name ZONE NUMBER must appear as is, starting in column 37.

When more than one A-file is in use, the zone number must appear on each record of each file, in the same field on all files. Only one ZONE NUMBER ID Card is coded, indicating any one of the A-files in column 22.

Table IV-3

UMODEL SHOP/SR LOS Matrix Variable ID Cards

CARD COLUMNS			
2,3	5	9-12	37-60
ID Number	Type	UTPS Matrix Code	Name
Consecutive from next number after 'ZONE NUMBER'	X X X X X	1000* J-File + Table Number	VTIME VDISTS VTOLLS QTIME QFARES

ID Numbers in columns 2,3 continue in sequence starting with the first number after the 'ZONE NUMBER' ID number on the Zone Data ID Cards, Table IV-2. For example, if the 'ZONE NUMBER' has ID number 22, then the LOS variables are numbered 23-27.

Column 5 'X' indicates matrix data.

Columns 9-12 contain standard UTPS matrix indices. For example, if one of the variables is table 4 on input file J2, then 2004 is coded.

THE MATRIX CODES MUST HAVE STRICTLY ASCENDING VALUES FROM VTIME TO QFARES.

The contents of 37-60 are arbitrary. The names shown in the table are the standard SRGP names used throughout this manual.

SRGP/JSYSIN CONTROL STATEMENTS

The &SRGP, &OPTION, &CMODEL, &POOLS, &UZONE, &UHH, &UWORK, &UPLAY

statements are in standard IBM Namelist format. They are all optional,

but those that are present must be in the following order:

&SRGP
&OPTION
&CMODEL
&POOLS
&UZONE
&UHH
&UWORK
&UPLAY

The &SRGP statement is used to set run parameters and select output trips

and emissions matrices, Table IV-4. It contains variables that set global

model parameters and control the output tables produced on the 'J9' file.

The &OPTION statement controls which models are used, Table IV-5. The

&CMODEL statement allows the user to revise specific coefficients in the

models, Table IV-6. The &POOLS statement controls the auto and vanpooling

model options. the &U _ _ _ statements allow the user to easily represent

various transportation policies to the system.

TABLE IV-4

<u>&SRGP Keywords</u>

SRGP Keywords

	KEYWORD	TYPE	DEFAULT	MAX	PURPOSE
& S R G P	GAS	R	32.4	–	Price of gas per gallon in cents (1965 values)
	AO2	R	2.116	–	Average number of vehicles owned by households owning at least two vehicles. (Used as the number of autos implied in the '2+' auto ownership model alternative)
	AOCSH	R	2.5	–.	Average auto occupancy for shop trips.
	AOCSR	R	2.5	–	Average auto occupancy for social/recreational trips
	CAROWN	R	1000.	–	Annual cost in dollars of owning one car (1965 values)
	AWSROC	R	1.	–	If greater than 2, the input value overrides the value calculated by the shared ride occupancy model (work only)
	RSHOP, RSR	R	999.		Maximum distance in miles for an O-D pair to be considered as a non-work destination. Applies only to non-CBD destinations. Applied to shop and soc-rec separately

TABLE IV-4 (continued)

KEYWORD	TYPE	DEFAULT	PURPOSE
TSCALE	R	10.	Scale factor for scaling up all output tables controlled by the following keywords
OWQR	I	0	Output table number for Work Park-Ride Persons
OWDA	I	0	Output table number for Work Drive Alone trips
OWSHRP	I	0	Output table number for Work Shared Ride Person trips
OWSHRV	I	0	Output table number for Work Shared Ride Vehicle trips
OWQ	I	0	Output table number for Work Transit Person trips (includes Park-Ride)
OSHOPP	I	0	Output table number for Shop Auto Person trips
OSHOPV	I	0	Output table number for Shop Auto Vehicle trips
OSHOPQ	I	0	Output table number for Shop Transit Person trips
OSRP	I	0	Output table number for S/R Auto Person trips
OSRV	I	0	Output table number for S/R Auto Vehicle trips
OSRQ	I	0	Output table number for S/R Transit Person trips
OWHC	I	0	Output table number for Work Hydrocarbons 1
OWCO	I	0	Output table number for Work carbon monoxide 1
OWNX	I	0	Output table number for Work nitrogen oxides 1
OSSHC	I	0	Output table number for Non-Work hydrocarbons 1
OSSCO	I	0	Output table number for Non-Work carbon monoxide 1
OSSNX	I	0	Output table number for Non-Work nitrogen oxides 1

Notes for Table IV-4

1. The units of the emissions tables are kilograms times TSCALE.

2. The default value of zero implies no output of the corresponding table type.

3. If two or more trip types are routed to the same table, then their sum is output.

4. The UTPS format matrices which are output from SRGP under control of the 0-table keywords are required to contain integer data. The TSCALE keyword is provided so that precision may be maintained by scaling up the tables before truncation and conversion to integer for output.

Examples

a. &SRGP OWDA=1, OWSHRP=2, OWQ=3, &END

This statement causes work person drive alone, shared ride, and transit trips to be written separately as tables 1, 2, and 3 respectively.

b. &SRGP OWDA=1, OWSHRV=1, OSHOPV=1, OSRV=1 &END

This statement causes total vehicle trips to be written out in table 1.

TABLE IV-5

Namelist &OPTION

	KEYWORD	TYPE	DEFAULT	PURPOSE
& O P T I O N	AO	L	T	= T to run auto ownership model (requires WORK, SHOP, SR=T)
	WORK	L	T	= T to run work mode split model
	SHOP	L	T	= T to run shop mode/destination and frequency models
	SR	L	T	= T to run social-recreational mode/ destination and frequency models
	RDBASE	L	F	= T to read a base impact file for producing a comparison report
	WRBASE	L	F	= T to write a new base impact file for later use by SRGP

TABLE IV-6

Namelist &CMODEL Keywords

Namelist &CMODEL

Namelist &CMODEL permits the user to selectively or completely redefine
the internal model coefficients which would otherwise default to the values
given in Tables IV-15 through IV-22.

	KEYWORD	TYPE	PURPOSE
&	CFWORK	R(17)	Work mode split parameters
C	CFSHRO	R(3)	Shared ride occupancy parameters
M	CFSHOP	R(9)	Shop destination/mode parameters
O	CFSHG	R(7)	Shop frequency parameters
D	CFSR	R(12)	Soc.-Rec. destination/mode parameters
E	CFSRG	R(6)	Soc.-Rec. frequency parameters
L	CFAON	R(6)	Non-worker-household auto ownership parameters
	CFAO	R(10)	Worker-household auto ownership parameters

Namelist &POOLS

Namelist &POOLS invokes the employer based pooling options and supplies the parameters used by the program and the work travel models. Table IV-7 describes the &POOLS keywords. The &POOLS statement is placed behind the &CMODEL statement, if any.

.Each type of pooling, car or van, requires a zone variable input to furnish the distribution of employers which support the corresponding policies; if both policies are to be represented in the same run, two zone variables may be defined for this purpose. The UMODEL ID numbers of these variables are defined on the &POOLS statement with the 'ZCPOOL' and 'ZVPOOL' keywords. These zone variables indicate the proportion or probability of work trips to the zone which are attracted to employers which sponsor the pools; in other words the pool zone variable gives the proportion of trips to the zone which has a pooling option available. These values must be derived exogenously from employer size distribution data, etc.

SRGP's internal methodology involves sampling from the implied distributions of pool sponsors. For each trip to a zone with non-zero pooling probability, a random drawing is made against the probability; the result determines whether the trip is treated wholly as a pool trip or wholly not.

Carpool is simply the shared ride mode alternative, adjusted by the &POOLS keyword parameters. Vanpool is an independent fourth mode which coexists with and competes with the shared ride/carpool mode.

All the &POOLS keywords which refer to SRGP inputs in the HHWORK file or the zone data file apply to post-"Update" values of these variables. The carpool keywords do not, however, affect the vanpool source variables, nor do vanpool keywords affect carpool data. The Z-variables pointed to

by the ZCPOOL and ZVPOOL keywords may be updated with &UZONE statements.

The default vanpool coefficients are derived from the shared ride

utility function's coefficients--if the defaults are not appropriate,

they should be changed.

The user should note that global updates to the vanpool data may be

achieved through modification of the CFVP coefficients.

The vanpool alternative is available for a particular trip under

the following joint conditions when ZVPOOL = 20 or 21:

1. The drive alone line distance, VDISTW, of the trip is greater than or equal to VPMIND;

2. If CFVP(4), the coefficient of VONTIM (drive alone line time) is not zero, then the VONTIM (after updating) must be not zero;

3. If CFVP(5), the coefficient of SONTIM (shared ride line time) is not zero, then the SONTIM (after updating) must be not zero;

4. The zone datum indicated by ZVPOOL, i.e., Z(ZVPOOL,work zone), is greater than zero and greater than or equal to a uniform random drawing from the 0-1 interval.

The existence of the vanpool mode and a non-zero estimated probability

of its usage on a given trip and over all trips will have no effect on the

auto ownership model. The only linkage between the vanpool option and the

auto ownership model could be the expected breadwinner work trip cost.

However, because vanpool would lower the expected cost for any trip where

vanpool is not the most costly mode, it would cause counter-intuitive

increases in auto ownership, hence this linkage has been explicitly

bypassed: the expected breadwinner trip cost is calculated as if the

vanpool option did not exist.

The vanpool option will only affect the Social/Recreational models

through the "autos remaining" term. The vanpool option will increase autos

remaining after work trips, and will thus stimulate non-work auto travel.

TABLE IV-7

&POOLS Keywords

	KEYWORD	TYPE	DEFAULT	PURPOSE
&POOLS	ZCPOOL	I	0	Index of carpool sponsor worker distribution in Z array. "Turns on" employer carpool incentives if non-zero.[1]
	CPRIDE	R(2)	1.0, 0.0	Factor, increment for shared ride in-vehicle time SONTIM if employer sponsors carpools.
	CPWALK	R(2)	1.0, 0.0	Factor, increment for shared ride out-of-vehicle time (SWLKWO ← SWLKWD) if employer sponsors carpools.
	CPCOST	R(2)	1.0, 0.0	Factor, increment for shared ride parking cost per person if employer sponsors carpools.
	DARIDE	R(2)	1.0, 0.0	Factor, increment for drive alone in-vehicle time (VONTIM) if employer is carpool sponsor.
	DAWALK	R(2)	1.0, 0.0	Factor, increment for drive alone walk time (VWLKWO + WLKWD) if employer is carpool sponsor.
	DACOST	R(2)	1.0, 0.0	Factor, increment for drive alone parking cost if employer sponsors carpools.
	PMATCH	R	0.0	Dummy variable in shared ride utility function to represent the effect of "qualitative" incentives like address-matching, promotionals, etc.
	ZVPOOL	I	0	Index of vanpool sponsor worker distribution in Z array. "Turns on" employer-based vanpool option if non-zero.[2]
	VPOX	I	9.0	Occupancy of vanpool vehicle.
	OVPP	I	0	Output table number for vanpool person trips.
	OVPV	I	0	Output table number for vanpool vehicle trips.
	CFVP	R(17)		Coefficients of vanpool utility function.
	VPMIND		5.0	Minimum work trip (drive alone) distance (miles) to qualify for vanpool service.

&POOLS Keyword Table, cont'd.

	KEYWORD	TYPE	DEFAULT	PURPOSE
&POOLS	CFVP(1)		.0000137	DINC - Disposable income (dollars)
	CFVP(2)		-.347	CBD - CBD Dummy $\begin{array}{l}= 1 \text{ if CBD} \\ = 0 \text{ if not}\end{array}$
	CFVP(3)		.327	NWORK - Number of HH workers
	CFVP(4)		-0.122	VONTIM - Drive alone in-vehicle time (minutes)
	CFVP(5)		0.0	SONTIM - Shared ride in-vehicle time (minutes)
	CFVP(6)		0.0	(VWLKWO + VWLKWD) - Drive alone walk time (minutes)
	CFVP(7)		-.0335	(SWLKWO + SWLKWD) - Shared ride walk time (minutes)
	CFVP(8)		1.763	AW - Autos/worker
	CFVP(9)		-3.473	DU - Vanpool constant
	CFVP(10)		0.0	BW - Breadwinner constant
	CFVP(11)		-102.01	VDISTW/10 - Drive alone distance (miles)[3,4].
	CFVP(12)		0.0	SDIST/10 - Shared ride distance (miles)[3,4].
	CFVP(13)		0.0	VTOLLW - Drive alone tolls[3] (cents).
	CFVP(14)		-21.43	STOLL - Shared ride tolls[3] (cents).
	CFVP(15)		0.0	(VPRKWO + VPRKWD) - Drive alone park costs[3] (cents).
	CFVP(16)		-21.43	(SPRKWO + SPRKWD) - Shared ride park costs[3] (cents).
	CFVP(17)		389.0	-21.43 - Per trip ownership (fixed) cost of vanpooling trip (cents)[3,5].
	End of CFVP			

Notes for Table IV-7

1. If ZCPOOL = 0, the &POOLS keywords CPRIDE, CPWALK, CPCOST, DARIDE, DAWALK, DACOST, and PMATCH have no effect. ZCPOOL must be either 20 or 21, if not zero. (The "ZONE NUMBER" item must be moved to the end of the Z array, location 21 or 22.)

2. If ZVPOOL = 0, the &POOLS keywords VPOX, OVPP, OVPV, VPMIND, and CFVP have no effect. ZVPOOL must be either 20 or 21, if not zero. (The "ZONE NUMBER" item must be moved to the end of Z, location 21 or 22). ZVPOOL may equal ZCPOOL (i.e. same Zonal variable may be used for both).

3. All vanpool costs also are divided by family income (INCOME*10) and vanpool occupancy (VPOX). That is, for example, the shared ride toll variable STOLL is entered in the vanpool utility function as CFVP(13)*(STOLL/(INCOME*10.*VPOX))

4. The distance coefficients CFVP (11) and CFVP (12) are intended to supply both the effect of distance on operating costs and the effect of operating costs on vanpool utility. The default value, -102.01 represents the product of 4.76 cents/mi. (1965 $) operating cost, and -21.43, the coefficient of out of pocket cost in the shared ride utility function.

5. The vanpool fixed cost (over income and vanpool occupancy) item, CFVP (17) is a dummy variable intended to contribute the fixed costs of vanpool ownership to the passengers in the utility function. The "associated variable", -21.43, is the value of one spent cent (1965) in the utility function. The default CFVP (16), 389, represents an average amortized daily van capital cost of $3.89 to be distributed among the VPOX passengers, about $.43 per person at the default VPOX of 9.

Example of Carpool Option Set-up

```
// EXEC UMODEL,
//HHWORK = 'your HH/work file',
//A1 = 'your first zone data file',
//A2 = 'your second zone data file',
//:
//A<N> = 'your N'th zone data file',
//J1 = 'your first interchange data file',
//J2 = 'your second interchange data file',
//:
//J<N> = 'your N'th interchange data file'
// SYSIN DD *
```

                                    Title


```
&PARAM · · · · &END
&SELECT · · · · &END
&EQUIV
      •
    •   •
            · &END                        ≀
&DATA
 :
 :
First 19 data ID cards as illustrated in  SRGP documentation
 :                       A
20A <field> 20 <file>         Employer sponsored carpool probability
21A <field> 21 <f_ile^A >     ZONE NUMBER
22X <J-file>                  VTIME
23    etc.
```

```
// JSYSIN DD *
                          SRGP Control File
                          Another Title, etc.
```

   This statement invokes the carpool option, reduces carpool cost by half, and
   subtracts one minute from carpool walk time

```
&POOLS  ZCPOOL = 20, CPCOST = .5, CPWALK(2) = -1. &END
//
```

Vanpool Example

   As above, except 20'th UMODEL Data ID card:
                       A
```
20A <field> 20 <file>         Employer sponsored carpool probability
21A <field> 21 <f_ile^A >     ZONE NUMBER
22X <J-file>                  VTIME
23    etc.
```

```
//JSYSIN DD *
     Modify vanpool constant
&POOLS  ZVPOOL = 20, CFVP(9) = -4.5  &END
//
```

Update Namelists - &UHH, &UZONE, &UWORK, &UPLAY

These control statements provide the capability for introducing a linear modification of any items in the input data. The modifications are zone or interchange specific. That is, the user may specify one set of changes for data pertaining to one area or trip movement and another different set of changes for other areas and/or movements. The Update statement keywords are defined in Table IV-8.

In order to associate the input data with the Update statements, the data is considered in four logical sub-dividions: Zone, Household, Worker/Work-Trip and Shop/SR (matrix data. There are four corresponding types of Update statements: &UZONE, &UHH, &UWORK, and &UPLAY, respectively. Within each data type, the substantive data items are identified by sequentially numbered fields defined in Tables IV-11 through IV-14. Thus the statement

&UHH ZONE=2,-5,9,FAC(3)=2.5,ADD(3)=1,ADD(6)=.1 &END

appearing in the SRGP control file instructs the program to modify the household data of all households in zones 2,3,4,5 and 9 by multiplying field 3 by 2.5 and adding 1 to the result, and by adding .1 to field 6. Interchange-type data, primarily work and Shop/SR levels of service, are referenced on a district-to-district basis. For example, the statement

&UWORK ODIST=2,4,DDIST=1,-5,FAC(8)=2,ADD(10)=10 &END

means to multiply work data field 8 by 2 and add 10 to field 10, for any work trip from an origin (home) zone in districts 2 or 4 to a work destination zone in districts 1 through 5. (The districts are those defined in the UMODEL &EQUIV namelists.) Any number of Updates for each or every one of the four

TABLE IV-8

Keywords for Update Namelists

	KEYWORD	TYPE	DEFAULT	MAX	PURPOSE
&UZONE	ZONE	I(50)	0	(ZONES)	Zones and zone number ranges to which this zone data update refers
	FAC(J)	R(19)	1.0	–	Factor to apply to zone data field J^5
	ADD(J)	R(19)	0.0	–	Increment to apply to zone data field J^5.
&UHH	ZONE	I(50)	0	(ZONES)	Home zones and zone number ranges of households which this household data update affects
	FAC(J)	R(10)	1.0	–	Factor to apply to HH data field J^5.
	ADD(J)	R(10)	0.0	–	Increment to apply to HH data field J^5.
&UWORK	ODIST	I(50)	0	(DISTS)	Origin (home) districts and district number ranges of work trips affected by this work data update.
	DDIST	I(50)	0	(DISTS)	Destination districts and district number ranges of Work trips affected by this Work data update.
	FAC(J)	R(15)	1.0	–	Factor to apply to work data field J^5.
	ADD(J)	R(15)	0.0	–	Increment to apply to work data field J^5.
&UPLAY	ODIST	I(50)	0	(DISTS)	Origin (home) districts and district number ranges of Shop and SR trips affected by this Shop/SR data update.
	DDIST	I(50)	0	(DISTS)	Destination districts and district number ranges of Shop and SR trips affected by this Shop/SR data update.
	FAC(J)	R(5)	1.0	–	Factor to apply to Shop/SR data field J^5.
	ADD(J)	R(5)	0.0	–	Increment to apply to Shop/SR data field J^5.

Notes for Table IV-8

1. FAC's are applied before ADD's.

2. Any one zone or single district-to-district interchange can be referenced
    by one and only one Update of each type. That is, all FAC's and ADD's
    of a single type (&UZONE, &UHH, &UWORK, or &UPLAY) which affect a given
    zone or interchange must be specified entirely on one Update statement.
    For example, to double the first zone data field of zones 1 through
    10 and add 1 to the second zone data field of zones 1 through 5 only, the
    &UZONE statements cannot be coded as follows:

    &UZONE ZONE = 1, -10, FAC(1) = 2 &END

    &UZONE ZONE = 1, -5, ADD(2) = 1 &END

    because zones 1 to 5 are referenced on both statements. Instead, the

    updates must be given like this:

    &UZONE ZONE = 1, -5, FAC(1) = 2, ADD(2) = 1 &END

    &UZONE ZONE = 6, -10, FAC(1) = 2 &END

    Likewise to add 2 to Shop/SR field 2 for interchanges from district 1
    to districts 1 through 5, and to add 4 to Shop/SR field 3 for district
    interchange 1 to 3, then the updates cannot be

    &UPLAY ODIST = 1, DDIST = 1, -5, ADD(2) = 2 &END

    &UPLAY ODIST = 1, DDIST = 3, ADD(3) = 4 &END

    because the interchange 1 to 3 is referenced on both &UPLAY statements.

    To achieve the desired effect, the updates must be specified:

    &UPLAY ODIST = 1, DDIST = 1,2,4,5, ADD(2) = 2 &END

    &UPLAY ODIST = 1, DDIST = 3, ADD(2) = 2, ADD(3) = 4 &END

3. If there are &UWORK updates then these conditions must exist also:

    WORK = T on &OPTION statement

    DISTS $\neq$ 0 on &PARAM statement (UMODEL)

4. If there are &UPLAY updates, then these conditions must exist:

  SHOP = T or SR = T on &OPTION statement

  DISTS $\neq$ 0 on &PARAM statement (UMODEL)

5. FAC,ADD "field" numbers are defined in the cross reference Tables IV-11 and IV-14.

6. &UZONE FAC's and ADD's may refer to zone variables 20 and 21 if they are in use in conjunction with the &POOLS statement.

data types may be specified. Some 50 different data items, all the data used by all the models, are accessible to the Update statements.

The Updates &UWORK and &UPLAY provide the principal means of representing the effects of policy upon transportation services. In addition, the &UHH and &UZONE Updates can be employed to specify changes in household attributes or zone activities as a result of exogenous (external to SRGP) modelling, new data, time, or policy. Furthermore, since the expansion factors are treated as part of the household data, they too may be manipulated with the &UHH Updates.

The Update facility is designed to eliminate the need to recreate program input data for each policy option in a series under analysis. Instead, a single set of master files representing all households, zones, and interchanges affected by any of the policy options in a series can be generated once for a "base case" and reused with different Update specifications. In practice, this capability proves to be very effective for testing groups of policy alternatives against a common background.

RELATIONSHIP OF INPUT VARIABLES TO UPDATES AND MODELS

Tables IV-10 through IV-14 list all SRGP input variables. For each

variable, the tables give its Update type (&UZONE, &UHH, &UWORK, or &UPLAY),

its Update FAC/ACD index number, and indications of which models use the

variable. In the tables the models are denoted by the following

abbreviations:

    AO - auto ownership for households with worker(s)
    AON - auto ownership for households without worker(s)
     W - work mode choice
    SHG - shop trip generation
    SRG - social-recreation trip generation
     SH - shop trip mode/destination
     SR - social/recreational trip mode/destination
     CP - carpool size model
     OF - auto operating cost and fuel consumption

Note that the models listed in Tables IV-11 to IV-14 as using the

SRGP input variables are those into which the variables enter directly.

Because of the structure of the models, it is possible for a variable to

enter a model indirectly, by being passed from another model in a "logsum"

variable, via "autos remaining after work trips", or through modal probab-

ilities. These indirect linkages occur between each non-work destination/

mode model and its corresponding non-work trip generation model; also

linkages occur from shop destination/ mode choice and work mode choice to

the auto ownership model, and from work mode choice to social-recreational

mode destination, and trip generation. Figure IV-1 and Table IV-9

summarize these linkages.

```
┌──────────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
│   LAND USE   │ │ PREDETERMINED│ │  TRANSPORT   │ │SOCIO-ECONOMIC│
│CHARACTERISTICS│ │  HOUSEHOLD   │ │LEVEL-OF-SERVICE│ │CHARACTERISTICS│
│              │ │  LOCATIONAL  │ │ AVAILABLE TO │ │      OF      │
│              │ │  VARIABLES   │ │  HOUSEHOLD   │ │  HOUSEHOLD   │
└──────────────┘ └──────────────┘ └──────────────┘ └──────────────┘
```
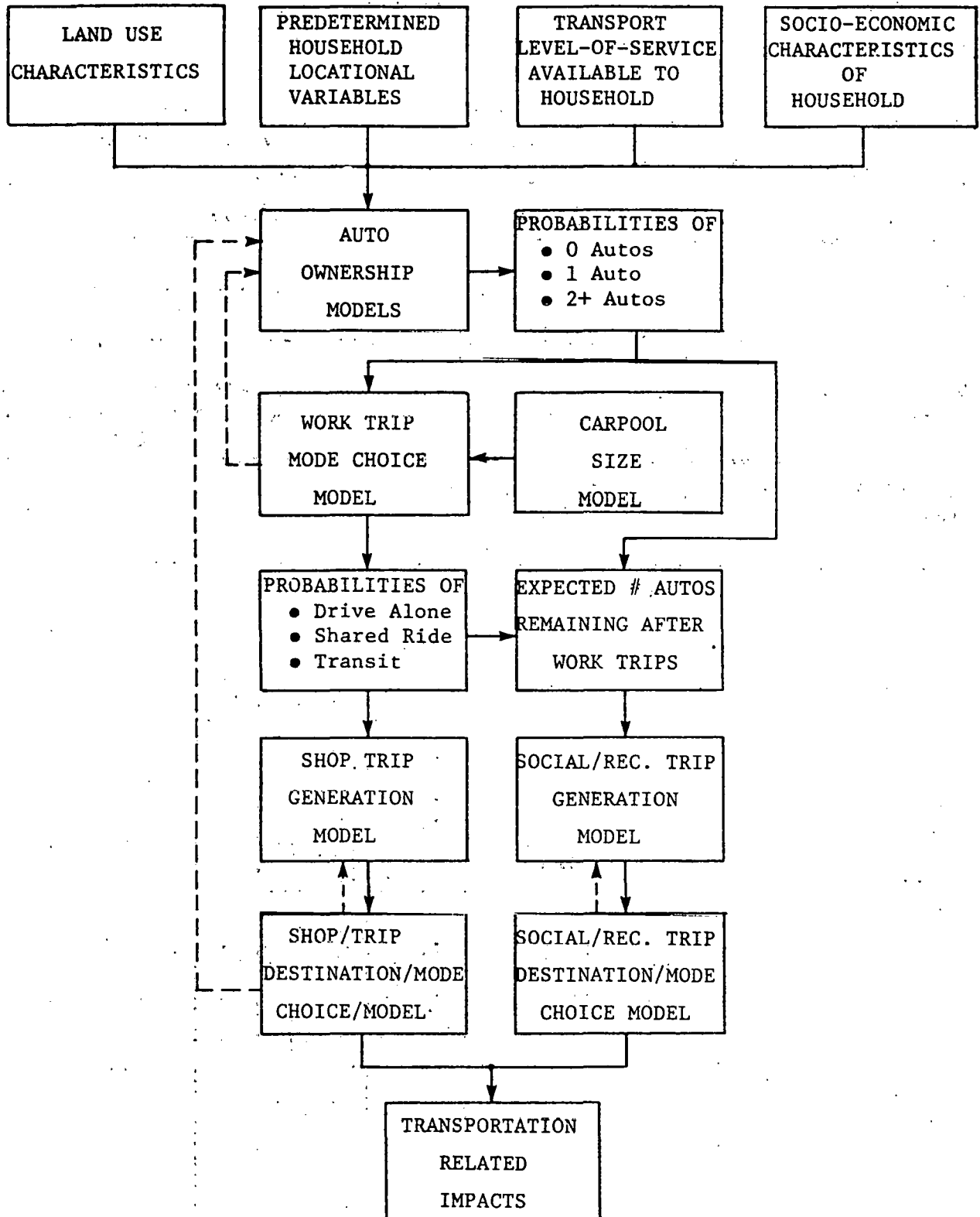

FIGURE IV-1

Travel Demand Model Linkages

(Indirect linkages shown by dashed lines)

A variable that appears directly here.....	will always have an indirect effect here.....	and will have an indirect effect here only when AO is modelled.
WORK . . . . (W)	. . . .	worker auto ownership (AO)
SHOP dest/mode . . . . (SH)	SHOP generation . . . . . (SHG)	worker auto ownership (AO) non-worker auto ownership (AON)
SOC-REC dest/mode . . . . . (SR)	SOC-REC generation (SRG)	

TABLE IV-9

<u>Summary of Model Linkages</u>

TABLE IV-10

SRGP Input Variables In Namelist &SRGP on File FT01F001

NAME	MODEL IN WHICH THE SRGP VARIABLE IS USED									NOTES
	AO	AON	W	SHG	SRG	SH	SR	CP	OF	
AWSROC			W							1
CAROWN	AO									
GAS									OF	
AO2	AO		W			SH	SR			2

Notes:

1. If AWSROC is greater than 2, it is used to override the results of the shared ride occupancy model.

2. AO2 is not used in any models if the auto ownership model is not selected.

TABLE IV-11

SRGP Input Variables In Zonal Data Files A1-A7

NAME	INDEX OF ADD and FAC IN &UZONE	MODEL IN WHICH THE SRGP VARIABLE IS USED								
		AO	AON	W	SHG	SRG	SH	SR	CP	OF
CBD	1			W			SH			
HHLOC	2									
RJOBS	3	AO			SHG	SRG	SH	SR		
SJOBS	4	AO			SHG					
ACRES	5	AO	AON		SHG	SRG		SR		
PACRES	6						SH			
POP	7		AON			SRG		SR		
VPRKWO	8	AO		W						
VPRKWD	9	AO		W						
VWLKWO	10			W						
VWLKWD	11			W						
VPRKSO	12						SH	SR		
VPRKSD	13						SH	SR		
VWLKSO	14						SH	SR		
VWLKSD	15						SH	SR		
SPRKWO	16	AO		W						
SPRKWD	17	AO		W						
SWLKWO	18			W						
SWLKWD	19			W						

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TABLE VI-12

SRGP Input Variables in Household Segment of File HHWORK on FT03F001

NAME	INDEX OF ADD and FAC IN &UHH	MODEL IN WHICH THE SRGP VARIABLE IS USED								
		AO	AON	W	SHG	SRG	SH	SR	CP	OF
HHSIZE	1	AO		W	SHG	SRG	SH	SR	CP	
INCOME	2	AO	AON	W	SHG	SRG	SH	SR	CP	
NWORK	3			W		SRG				
DUTYPE	4	AO								
BASEAO	5			W			SH	SR		
BASEAR	6							SR		
HXFCTR	7	AO	AON							
WXFCTR	8			W						
SXFCTR	9				SHG		SH			
RXFCTR	10					SRG		SR		

TABLE IV-13

SRGP Input Variables in Work Trip Segment of File HHWORK on FT03F001

NAME	INDEX OF ADD and FAC IN & UWORK	MODEL IN WHICH THE SRGP VARIABLE IS USED								
		AO[2]	AON	W	SHG	SRG	SH	SR	CP	OF
BW	1	AO		W						
QAAC2	2	AO		W						
QWALK	3	AO		W						
VONTIM [1]	4	AO		W						OF
QONTIM [1]	5	AO		W						
QHDWY	6	AO		W						
QXFER2	7	AO		W						
VTOLLW	8	AO		W						
VDISTW	9	AO		W						OF
QFARE	10	AO		W						
QDIST	11	AO		W						OF
QPARK	12	AO		W						
SONTIM	13	AO		W					CP	OF
STOLL	14	AO		W						
SDIST	15	AO		W						OF

[1] In-vehicle times are used to determine model availability; if the in-time for a mode is less than or equal to zero, the mode is not available.

[2] All attributes of the breadwinner or primary worker's trip (BW=1) enter the auto ownership model.

TABLE IV-14

SRGP Input Variables in Non-Work LOS Input Matrices J1-J7

NAME	INDEX OF ADD and FAC IN & UPLAY	MODEL IN WHICH THE SRGP VARIABLE IS USED								
		AO	AON	W	SHC	SRG	SH	SR	CP	OF
VTIME [1]	1						SH	SR		OF
VDISTS	2						SH	SR		OF
VTOLLS	3						SH	SR		
QTIME [1]	4						SH	SR		
QFARES	5						CH	SR		

[1] Modal on-vehicle times are used to determine modal availability; if the on-time for a mode is less than or equal to zero, the mode is not available.

GENERAL NOTES REGARDING THE DATA

Availability of Alternatives

For all trip purposes, SRGP analyzes the modal in-vehicle travel
times to determine whether a particular mode is available for a particular
destination. If the time (after applying the updates) is less than or
equal to zero, the mode/destination alternative associated with the time
is unavailable. There are several constraints that the user must be
aware of when constructing the travel times:

1) There must be at least one mode available for each work trip and
   there must be at least one mode and destination combination avail-
   able for each household for the non-work models.

2) When the AO model is being run, each household must have at least
   one shop destination available by auto.

3) When the AO model is being run, every breadwinner must be able to
   make his or her work trip by at least either shared ride or drive
   alone.

SRGP also will delete destinations (for both modes) if there are zero
values in a purpose's zone activity variables (i.e. zone data items 3, 4,
5, and 7).

Data Checking

SRGP has the capability to detect the occurrence of execution errors
which typically stem from data errors - improper zone codes, invalid
values, etc. The errors include divide checks, overflows, underflows,
arguments out of allowed ranges for exponetiation, etc. When SRGP detects
such an error, it terminates the run. SRGP does not do much substantive
checking of the data that it reads, or that is created by the Update
statements.

The following data items should never be zero:

    INCOME   (HH segment)

    NWORK   (HH segment) - should not be zero if NWORKS is not zero.

Cost Data

Because all SRGP's models were estimated on 1965 data, all the cost inputs must be in 1965 values.

CROSS REFERENCE OF MODEL SYSTEM VARIABLES TO SRGP INPUT VARIABLES

Tables IV-15 to IV-22 allow the user to refer from the model system variables as defined in Reference (1) to the corresponding SRGP input variables. For each model system variable defined in Reference (1), the following is given:

- The Namelist variable that contains its coefficient,

- The SRGP default value of the coefficient, and

- The exact composition of the variable in terms of SRGP input variables.

This set of tables is organized by model. In the tables, zonal variables are indexed by HZ and WZ to indicate they are for the home and work zone respectively. Interchange variables are indexed by HZ, DZ to indicate home zone and destination zone. Reference is made to a submodel AOPCST, which computes the cost of a trip (in cents) given the trip time in minutes and distance in miles. This submodel is discussed separately. The tables describe the following models in the same order in which they appear in the technical model description, Reference (1):

IV-15 Auto Ownership for Households with Worker(s)
IV-16 Auto Ownership for Households without Worker(s)
IV-17 Work Mode Choice
IV-18 Carpool Size Model for Work Trips
IV-19 Shopping Trip Generation
IV-20 Social-Recreational Trip Generation
IV-21 Destination and Mode Choice for Shopping Trips
IV-22 Destination and Mode Choice for Social-Recreational Trips

TABLE IV-15

Cross Reference of Model System Variables to SRGP Input Variables

for Auto Ownership Model for Households with Workers

MODEL VARIABLE NAME	INDEX IN &CFAO DEFAULT	ALTERNATIVE: VARIABLE EXPRESSED IN TERMS OF SRCP INPUT VARIABLES [6]	NOTES
One car constant	1 4.989	AO=1: 1	
Two car constant	2 5.689	AO=AO2: 1	
LN(Remaining Income)	10 .7919	AO=0: LN(INCOME*10-750*HHSIZE -250*(PSHR(AO=0)*COST(SHR) +PQ(AO=0)*COST(Q))) AO=1: LN(INCOME*10-750*HHSIZE -CAROWN-250(PDA(AO=1)*COST(DA) +PSHR(AO=1)*COST(SHR) +PQ(AO=1)*COST(Q))) AO=AO2: LN(INCOME*10-750*HHSIZE -AO2*CAROWN -250(PDA(AO=AO2)*COST(DA) +PSHR(AO=AO2)*COST(SHR) +PQ(AO=AO2)*COST(Q)))	1,2,3, 5
Housing type	3 .3935	AO=1: IF DUTYPE = 1 THEN 1 ELSE 0	
Housing type	4 1.342	AO=AO2: IF DUTYPE = 1 THEN 1 ELSE 0	
Employment Density of Residence Zone	5 -.05419	AO=1, AO=AO2: (SJOBS(HZ)+RJOBS(HZ))/ ACRES(HZ)	

TABLE IV-15, continued

Cross Reference of Model System Variables to SRGP Input Variables

for Auto Ownership Model for Households with Workers

MODEL VARIABLE NAME	INDEX IN &CFAO DEFAULT	ALTERNATIVE: VARIABLE EXPRESSED IN TERMS OF SRGP INPUT VARIABLES[1]	NOTES
Relative Accessibility of Transit vs. Auto for work trips of the primary worker	9 .06814	AO=0: BWVQ(AO=0)/BWVSHR(AO=0)	4
		AO=1: BWVQ(AO=1)/(BWVDA(AO=1) +BWVSHR(AO=1))	4
		AO=AO2: BWVQ(AO=AO2)/(BWVDA(AO=AO2) +BWVSHR(AO=AO2))	4
Relative Accessibility of Transit vs. Auto for SHOP trips	8 .5608	AO=0: RSUMSH(=ratio of transit utility sum (over all destinations) over auto utility sum for AO=0.)	
		AO=1, AO=AO2: The values are nearly infinitesimal at non-zero AO levels, hence it has been deleted.	
Autos/Household Size	6 -2.689	AO=1: 1/HHSIZE	
Autos/Household Size	7 -2.689	AO=AO2: AO2/HHSIZE	

Notes for Table IV-15:

1. DA, SHR, Q are symbolic indices for Drive Alone, Shared Ride, and
    Transit respectively.

2. PDA, PSHR, PQ are breadwinner mode split probabilities by mode.

3. COST(MODE) is the breadwinner trip modal costs as follows:

    DA: AOPCST(VONTIM,VDISTW/10)+VTOLLW+VPRKWO(HZ)+VPRKWD(WZ)

    SHR: APOCST(SONTIM,VDISTS/10)+STOLL+SPRKWO(HZ)+SPRKWD(WZ)

    Q: QFARE+QAAC2*(QPARK+AOPCST(3.4286*QDIST/10,QDIST/10))

4. BWVDA, BWVSHR, BWVQ are the breadwinner mode split utilities by mode and
    AO level.

5. If remaining income at AO levels 1 or AO2 is not greater than zero,
    then that AO alternative is not available.

6. "HZ" represents "HOME ZONE".

TABLE IV-16

Cross Reference of Model System Variables to SRGP Input Variables

for Auto Ownership Model for Households.Without Workers

MODEL VARIABLE NAME	INDEX IN &CFAON DEFAULT	ALTERNATIVE: VARIABLE EXPRESSED IN TERMS OF SRGP INPUT VARIABLES[1]	NOTES
One Car Constant	1 −.8695	AO=1: 1	
Two Car Constant	2 −8.357	AO=AO2: i	
LN(Per Capita Disposable Income)	4 .3188	AO=1: LN((INCOME*10−750*HHSIZE)/HHSIZE)	
LN(Per Capita Disposable Income)	5 1.227	AO=AO2: LN((INCOME*10−750*HHSIZE)/HHSIZE)	
Relative Accessibility of Transit vs. Auto for SHOP	3 .6070	AO=O: Ratio of transit utility sum (over all destinations) over auto utility sum for AO=0.	
Population Density of Residence Zone	6 −.06820	AO=AO2: POP(HZ)/ACRES(HZ)	

Notes:

[1]"HZ" represents "HOME ZONE".

TABLE IV-17

Cross Reference of Model System Variables to SRGP Input Variables

for Work Mode Choice Model

MODEL VARIABLE NAME	INDEX IN &CFWORK DEFAULT	ALTERNATIVE: VARIABLE EXPRESSED IN TERMS OF SRGP INPUT VARIABLES[5]	NOTES
Drive Alone Constant	16 -2.511	DA: 1	
Shared Ride Constant	17 -3.473	SHR: 1	
Out of Pocket Travel Cost (round trip cents) divided by Household Income(annual dollars)	10 -21.43	DA: (AOPCST(VONTIM,VDISTW/10) +VTOLLW+VPRKWO(HZ)+VPRKWD(WZ))/ (INCOME*10) SHR: (AOPCST(SONTIM,SDIST/10) +STOLL+SPRKWO(HZ) +SPRKWD(WZ))/(INCOME*10*2.5) Q: QFARE+QAAC2*(QPARK+ AOPCST(3.4286*QDIST/10,QDIST/10))/ (INCOME*10)	1
On Vehicle Travel Time (round trip minutes)	5 -.0122	DA: VONTIM SHR: SONTIM Q: QONTIM	4
Walk Time (round trip minutes)	6 -.0335	DA: VWLKWO(HZ)+VWLKWD(WZ) SHR: SWLKWO(HZ)+SWLKWD(WZ) Q: QWALK	
Transit Headway up to 8 minutes	7 -.155	Q: MINIMUM(QHDWY,16)	2
Transit Headway over 8 minutes	8 -.0107	Q: MAXIMUM(0,QHDWY-16)	2

TABLE IV-17, continued

Cross Reference of Model System Variables to SRGP Input Variables

for Work Mode Choice Model

MODEL VARIABLE NAME	INDEX IN &CFWORK DEFAULT	ALTERNATIVE: VARIABLE EXPRESSED IN TERMS OF SRGP INPUT VARIABLES[5]	NOTES
Transfer Wait Time (round trip minutes)	9 -.0302	Q: QXFER2	
CBD Work Place	2 -1.067	DA: CBD(WZ)	
CBD Work Place	3 -.347	SHR: CBD(WZ)	
Auto Availability	11 1.958	DA: BASEAO/NWORK	3
	12 1.389	Q: QAAC2*BASEAO/NWORK	3
	13 1.763	SHR: BASEAO/NWORK	3
Car Access to Bus	15 -1.237	Q: QAAC2	
Breadwinner	14 .677	DA: BW	
Number of Workers	4 .327	SHR: NWORK	
Disposable Income (dollars)	1 .0000137	DA,SHR: MAXIMUM(0, (INCOME*10-750*HHSIZE))	

Notes for Table IV-17:

1. For purposes of estimating auto access operating costs, auto access time is estimated from auto access distance using an assumed auto speed of 3.4286 minutes per mile as was done in model estimation.

2. Initial transit headway enters in two ways:

   ● one-way scheduled bus headways up to 8 minutes summed for both directions (16 minutes maximum for round trip); and

   ● sum of the remainder of the headways (round trip minutes).

3. BASEAO is used only if auto ownership is not being modelled. Otherwise, the outputs of the AO model are in effect.

4. If modal on vehicle times are less than or equal to zero, the mode is not available.

5. For a trip from home zone ("HZ") to work zone ("WZ").

TABLE IV-18

Cross Reference of Model System Variables to SRGP Input Variables

for Carpool Size Model for Work Trips

MODEL VARIABLE NAME	INDEX IN &CF SHRO DEFAULT	EXPRESSED IN TERMS OF SRGP INPUT VARIABLES	NOTES
Constant	1 2.542		
Remaining Income ($/yr)	2 -.00004717	INCOME*10-750*HHSIZE	
Shared Ride In-Vehicle Travel Time (one way minutes)	3 .01116	SONTIM/2	

TABLE IV-19

Cross Reference of Model System Variables to SRGP Input Variables

for Shop Trip Generation Model

MODEL VARIABLE NAME	INDEX IN &CFSHG DEFAULT	EXPRESSED IN TERMS OF SRGP INPUT VARIABLES	NOTES
Constant	1 .8194		
Constant	2 .07766		
Household Size	3 -.3417	HHSIZE	
Income in 1000's of $	4 -.0515	INCOME*10/1000	
Retail and Service Employment Density	5 .1146	LN((SJOBS(HZ)+RJOBS(HZ))/ACRES(HZ))	
SUMV	6 -.0527	Sum of utilities of the choices of the household for the home based shop destination/mode choice model.	

TABLE IV-20

Cross Reference of Model System Variables to SRGP Input Variables

for Social-Recreational Trip Generation Model

MODEL VARIABLE NAME	INDEX IN &CF SRG DEFAULT	EXPRESSED IN TERMS OF SRGP INPUT VARIABLES	
Constant	1 .1439		
Household Size	2 .4671	HHSIZE	
Income (1000's of $)	3 .3963	INCOME*10/1000	
Service Employment Density	4 -.3839	SJOBS(HZ)/ACRES(HZ)	
Non-Workers in Household	5 .005055	HHSIZE-NWORK	
SUMV	6 .06785	Sum of utilities of the choices of the household for the home based social-recreational destination/mode choice model.	

TABLE IV-21

Cross Reference of Model System Variables to SRGP Input Variables

for Shop Destination/Mode Choice Model

MODEL VARIABLE NAME	INDEX IN &CF SHOP DEFAULT	MODE: VARIABLE EXPRESSED IN TERMS OF SRGP INPUT VARIABLES FOR A TRIP FROM HOME ZONE HZ TO DESTINATION ZONE DZ	NOTES
Auto Constant	1 -.8631	AUTO: 1	
CBD Destination Constant	2 .8912	AUTO, TRAN: 1	
CBD Destination Constant for Auto	3 -.6337	AUTO: 1	
AUTOS/HOUSEHOLD SIZE	4 5.053	AUTO: BASEAO/HHSIZE	1
LN(Total travel time in one way minutes) times annual household income in 1000's of $	5 -.2020	AUTO: LN(VTIME(HZ,DZ)+VWLKSO(HZ) +VWLKSD(DZ))*INCOME*10/1000 TRAN: LN(QTIME(HZ,DZ))*INCOME*10/1000	
Auto Out of Pocket Travel Costs (one way cents)	6 -.02447	AUTO: AOPCST(VTIME(HZ,DZ), VDISTS(HZ,DZ)/10) +VTOLLS(HZ,DZ)+VPRKSO(HZ) +VPRKSD(DZ)	
Transit Fare (one way cents) times Household Size	7 -.02299	TRAN: QFARES(HZ,DZ)*HHSIZE	
Retail Employment Density	8 .0005995	AUTO,TRAN: RJOBS(HZ)/PACRES(HZ)	
LN(Retail Employment)	9 1.00	AUTO,TRAN: LN(RJOBS(HZ))	

BASEAO is replaced by an AO level specific variable when the AO model is run.

TABLE IV-22

Cross Reference of Model System Variables to SRGP Input Variables

for Social-Recreational Destination/Mode Choice Model

MODEL VARIABLE NAME	INDEX IN &CF SR DEFAULT	MODE : VARIABLE EXPRESSED IN TERMS OF SRGP INPUT VARIABLES[1]	NOTES
Auto Constant	1 1.844	AUTO: 1	
CBD Destination Constant	2 1.190	AUTO,TRAN: 1	
Auto CBD Destination Constant	3 -1.405	AUTO: 1	
Autos/Household Size	4 2.167	AUTO: BASEAO/HHSIZE	2
Autos Remaining After Work Trips	5 .3368	AUTO: BASEAR	2
LN(Total Travel Time in one way minutes) times Income in 1000's of $	6 -.1097	AUTO: $LN(VTIME(HZ,DZ)+VWLKSO(HZ)$ $+VWLKSD(DZ))*INCOME*10/1000$ TRAN: $LN(QTIME(HZ,DZ))$ $*INCOME*10/1000$	
Auto Out of Pocket Travel Costs, in one way units	7 -.0256	AUTO: $AOPCST(VTIME(HZ,DZ),$ $VDISTS(HZ,DZ)/10)+VTOLLS(HZ,DZ)$ $+VPRKSD(DZ)+VPRKSO(HZ)$	
Transit Fare (one way cents) times Household Size	8 -.0108	TRAN: $HHSIZE*QFARES(HZ,DZ)$	
Population Density (using total acres)	9 .0244	AUTO,TRAN: $POP(DZ)/ACRES(DZ)$	
Retail Employment Density (using population serving acres)	10 .0609	AUTO,TRAN: $RJOBS(DZ)/PACRES(DZ)$	

TABLE IV-22, continued

Cross Reference of Model System Variables to SRGP Input Variables

for Social-Recreational Destination/Mode Choice Model

MODEL VARIABLE NAME	INDEX IN &CFSR DEFAULT	MODE: VARIABLE EXPRESSED IN TERMS OF SRGP INPUT VARIABLES[1]	NOTES
LN(Population over retail employment)	11 .6998	AUTO,TRAN: LN(POP(DZ)/RJOBS(DZ))	
LN(Retail Employment)	12 1.00	AUTO,TRAN: LN(RJOBS(DZ))	

Notes:

1. Variables expressed for a trip from HOME ZONE ("HZ") to DESTINATION ZONE ("DZ")

2. BASEAO and BASEAR are replaced by AO level specific values when the AO model is run.

CROSS REFERENCE OF MODEL SYSTEM SUBMODELS TO THE MODELS WHICH INVOKE THEM
AND THE SRGP INPUT VARIABLES WHICH THEY USE

The model system has several submodels which are invoked by the models

described in the previous section as well as by the impact accumulation

routines. Table IV-23 shows for each submodel which model(s) use it and

which SRGP input variables are involved. The submodels are described

in the same order in which they appear in the technical model description,

Reference (1):

1. Fuel consumption
2. Auto emissions
3. Auto operating cost

Note that the fuel consumption model is used twice for each trip.

First it is applied by the auto operating cost model during demand estima-

tion. Later it is used directly for impact calculations. For non-work,

the auto occupancy is assumed to be two to correspond to the way in which

the demand models were calibrated. When called by the impact routines,

however, the occupancy is that supplied by the user in keywords AOCSH and

AOCSR in Namelist &SRGP.

TABLE IV-23

Submodel Cross Reference

SUBMODEL	CALLING MODELS OR ROUTINES	SRGP VARIABLES INVOLVED
Fuel Consumption	auto operating cost	See auto operating cost variables below.
	impact accumulation routines	VONTIM, VDISTW, work trip auto occupancy, VTIME, VDISTS, AOCSH, AOCSR
Auto Emissions	impact accumulation routines	VONTIM, VDISTW, VTIME, VDISTS
Auto Operating Cost	AO, W	VONTIM, VDISTW, work trip auto occupancy
	SH, SR	VTIME, VDISTS, auto occupancy=2

V. PROGRAMMER REFERENCE

This chapter describes SRGP's internal structure in terms which interest the programmer concerned with modifying or extending the program. The information in this chapter is not needed by the reader whose only interest is in running the program for policy analysis.

The "last word" to the programmer about SRCP is, of course, the FORTRAN source code. Therefore, some effort has been spent to structure and explain the source code with embedded comment cards. The programmer with a serious interest in SRGP will use the resources of this chapter as a guide to the detailed information in the source code and comments.

UMODEL

As mentioned in Chapter II, SRGP is a "user-coded" version of the UTPS program UMODEL. Information about UMODEL for programmers is supplied in abundance by References (3) and (4), and generally is not repeated here.

UMODEL invokes SRGP via the MODE13 entry points MOD13A, -B, -C, -D, -F from which, in turn, other SRGP subroutines are called directly or indirectly. The MODE13 entry points are called in alphabetical order and, except for MOD13D, each is called only once: MOD13A is called after the main program, UMODEL, has read the control cards in the SYSIN file; MOD13B is entered when the zone data has been read from the "A-files"; MOD13C is called to receive all the other dynamic arrays allocated by UMODEL; MOD13D is entered once for each origin (home) zone to be processed; MOD13F is entered during program close-out, after all zones have been processed. The structure of SRGP is aligned and synchronized with the functions of these entry points.

SRGP STRUCTURE

The subroutines comprising SRGP are inventoried and cross-referenced in Table V-1. Common blocks and their references are listed in Table V-2. Program logic and flow of control are outlined in Table V-3. The UMODEL regime organized around the MODE13 entries -A, -B, -C, -D, -F is mirrored in the descendant SRGP entry names with like suffixes.

1. Role of Auto Ownership. Auto ownership (AO) is at the "top" of the choice hierarchy in the SRGP model system (Figure IV-1); that is, all the lower models are conditioned (dependent) on auto ownership. In order. to support this conditioning when the AO Model is being executed (AO=T on &OPTION statement in the JSYSIN file), SRGP treats each household in effect as three households that are identical except for their auto ownership, which are the three levels of the AO Model: zero, one, and "two-and-more". The probabilities of each AO level from the AO Model are used to weight the travel of the household at each AO level into the expectation of the actual household travel over all AO levels.

This procedure preserves the conditioning role of auto ownership, the most important variable in the model system, at maximum disaggregation. That is, the expectation of auto ownership is never used as an independent variable in the travel models. Aggregation bias is thus avoided.

When the AO Models are not active (AO=F on the &OPTION statement), then most of the same SRGP logic and structure still apply, but the number of AO levels is set at one (instead of three), the number of autos represented at this single level is set to each household's observed AO, and the probability of this level is set to unity.

TABLE V-1.   SRGP Subroutines

Routine	Entries	Called By	Calls	Models	Function/Remarks
AOPCST	AOPC	MODE13 SHOPSR IMPACT	ERGA		Auto operating cost function
AQINIT	AIRPOL	IMPACT	--	Emissions	
DATA	DATAC DATAD	MODE13	--	--	Read HHWORK file.
DPOINT	--	UPDATE	--	--	Store Update indicators from &UWORK, &UPLAY statements.
ECHOA	--	MODE13	--	--	Print interpreted SRGP (JSYSIN) control statements
ERGA	ERGE	AOPCST IMPACT	--	Gas Consumption	
FILL2	--	UPDATE	--	--	Initialize halfword arrays.
FILL4	--	UPDATE MODE13	--	--	Initialize fullword arrays.
IMPACT	IMPCB1 IMPCB2 IMPCC1 IMPCC2 IMPCD IMPCF	MODE13 SHOPSR	ERGA AOPCST AQINIT	--	Calculate, store, print impacts. Read and write BASEI, BASEO impact files
JABEND	--	(ERRMON)[1]	--	--	Detect error-handling activity in FORTRAN library routines.
JROLL	--	MODE13	--	--	Cumulative ("rolling" or "bucket") round; convert REAL to INTEGER.
MODE13	MOD13A MOD13B MOD13C MOD13D MOD13F	(UMODEL)[2]	UPDATE DATA FILL4 ECHOA (GETCOR)[2] SHOPSR IMPACT AOPCST RANDOM JROLL VPOOL (ERRSET)[1] JABEND	Carpool Size Work Mode Choice	UMODEL interface. Main control logic. Read &SRGP, &OPTION, &CMODEL, &POOLS statements.
RANDOM	--	MODE13 VPOOL	--	--	Random number generator.

TABLE V-1. SRGP Subroutines, continued

Routine	Entries	Called By	Calls	Models	Function/Remarks
SHOPSR	SHSRC1	MODE13	UPDATE AOPCST IMPACT	Shop Dest./Mode Shop Destination S/R Dest./Mode S/R Generation AO/Worker HH	All non-work and AO demand models.
SPRED	--	UPDATE	--	--	Interpret Update ZONE, ODIST, DDIST ranges.
STASH	--	UPDATE	--	--	Store Update FAC, ADD's.
UPDATE	UPC1 UPC2 UPHA UPHB UPHD UPPA UPPB UPPD UPWA UPWB UPWD UPZB	MODE13 SHOPSR	FILL2 SPRED FILL4 STASH DPOINT	--	All Update processing. Read Update control statements.
VPOOL	--	MODE13	RANDOM	Vanpool Alterna- tive--work mode choice	

Also, there is a BLOCKDATA subprogram in the source code which specifies initial values for the COMMON areas (listed in Table V-2).

1. IBM FORTRAN library routines. See Reference (5).

2. UTPS/UMODEL modules.

TABLE V-2.   SRGP Common Blocks

Name	Referenced By	Function/Remarks
JSRGP	VPOOL DATA ECHOA UPDATE JABEND IMPACT MODE13 SHOPSR	&SRGP and &OPTION keywords and internally generated control variables.
MODS	VPOOL ECHOA IMPACT MODE13 SHOPSR	Output trip and emission matrix control variables.
CMOD	ECHOA MODE13 SHOPSR	&CMODEL model coefficients
PMOD	VPOOL ECHOA IMPACT MODE13	&POOLS keywords

TABLE V-3.   SRGP Logic/Flow Outline

1. MOD13A

    1.1. Sign on. Read control cards -- interpret and check.

        1.1.1. ECHOA

    1.2. Allocate core for UPDATE (UPHA, UPQA, UPPA).

2. MOD13B

    2.1. UPDATE (UPZB, UPHB, UPWB, UPPB).

        2.1.1. Read, interpret, check, store Updates.

            2.1.1.1. DPOINT, STASH, SPRED

    2.2. Allocate core for impact districts (IMPCB1) and initialize (IMPCB2).

3. MOD13C

    3.1. Check UMODEL control parameters.

    3.2. DATA (DATAC)

        3.2.1. Get first HH/WORK record.

        3.2.2. UPDATE (UPC1)

    3.3. Allocate core for SHOPSR (SHSRC1).

    3.4. Initialize

        3.4.1. SHOPSR (SHSRC2)

        3.4.2. IMPACT (IMPCC2)

            3.4.2.1. AQINIT, ERGA, AOPC

            3.4.2.2. If RDBASE=T, then read BASEI input base impact file.

4. MOD13D

    4.1. Initialize output table rows.

    4.2. DATA (DATAD)

        4.2.1. Obtain next household from HHWORK file.

    4.3. Match household zone with UMODEL "IZ" -- or scale, round, and fix (JROLL) output table rows and return to UMODEL.

    4.4. If this is the first household in this IZ and SHOP=T or SR=T, then

        4.4.1. SHOPSR (SHSRD1)

TABLE V-3.   SRGP Logic/Flow Outline, continued

 4.4.1.1.   Update input matrix data (UPPD).

 4.4.1.2.   Pre-calculate zone and interchange components of SHOP/SR utilities.

     4.4.1.2.1.   APOCST

         4.4.1.2.1.1.   ERGE

4.5.   Update household data (UPHD).

4.6.   Initialize Autos Remaining.

4.7.   If WORK=T, then loop over work trips in household.

 4.7.1.   Update worker/work trip data (UPWD)

 4.7.2.   Store Breadwinner index

 4.7.3.   Estimate shared ride occupancy

 4.7.4.   Evaluate non-auto-ownership components of work mode utilities

     4.7.4.1.   AOPCST

         4.7.4.1.1.   ERGE

 4.7.5.   If this is a vanpool run, then

     4.7.5.1.   VPOOL

         4.7.5.1.1.   RANDOM

 4.7.6.   Loop over auto ownership (AO) levels.

     4.7.6.1.   Evaluate modal utilities at each AO level.

     4.7.6.2.   Estimate AO-conditional mode probabilities.

     4.7.6.3.   Decrement AO-conditional Autos Remaining.

 4.7.7.   Save Breadwinner data for AO models.

4.8.   If SHOP=T or SR=T, then

 4.8.1.   SHOPSR (SHSRD2)

     4.8.1.1.   Loop over destinations

         4.8.1.1.1.   Evaluate Shop, SR mode/destination utility components that are independent of AO.

     4.8.1.2.   Loop over AO levels.

         4.8.1.2.1.   Evaluate modal utility sums over all destinations conditioned on AO.

         4.8.1.2.2.   Estimate modal trip generation conditioned on AO.

TABLE V-3. <u>SRGP Logic/Flow Outline</u>, continued

          4.8.1.3. If AO=T, then DO AO Models: Estimate AO level probabilities.

          4.8.1.4. Estimate trips (factors) by mode, total over all AO levels and destinations.

4.9. If WORK=T, then accumulate work mode probabilities over AO levels.

4.10. IMPACT (IMPCD)

    4.10.1. Identify household market segment

    4.10.2. Accumulate household impacts

    4.10.3. Loop over work trips

        4.10.3.1. Accumulate work impacts and trips and emissions output table rows.

          4.10.3.1.1. ERGE, AIRPOL

    4.10.4. Loop over destinations.

        4.10.4.1. Accumulate SHOP/SR impacts and trips and emissions output table rows.

          4.10.4.1.1. ERGE, AIRPOL

4.11. Return to 4.2.

5. MOD13F

5.1. IMPACT (IMPCF)

    5.1.1. Summarize and report impacts.

    5.1.2. If WRBASE=T, then write BASEO output impact file.

The variables in the SRGP source code which control the representation of auto ownership are described in Table V-4.

2.   Model Transformations. For the sake of efficient program execution, the various travel and AO Models are implemented in SRGP in forms which are derived from the specifications given in References (1) and (6). Although algebraically identical, these forms eliminate redundant computer calculations. In particular, for example, terms which vary only by AO level and/or mode are factored out of the destination loops in the non-work mode and destination choice models. It is thus possible to completely avoid any loop over destinations nested inside a loop over AO levels or vice versa, hence to reduce the number of loop cycles required to apply the models by two-thirds from that required for the models in their "natural" form.

3. Error Handling.   SRGP uses the IBM-supplied subroutines ERRSET and ERRMON to detect activity in the FORTRAN library error handling routines; when SRGP does identify error activity, the run is terminated. The communication of errors is affected via the SRGP subroutine JABEND, which is called by ERRMON.

Other than this, SRGP does not perform much data checking or other error detection, because of the rather substantial overhead which would be involved in thoroughly checking all the input data. (The JABEND method relies on the "interrupt system," which is essentially built-in, very efficient, and which cannot be disabled anyway.)

4. Test Mode Operation. The &OPTION statement in the JSYSIN file contains a set of "hidden" control options which can be invoked to command the

TABLE V-4. <u>Auto Ownership Control Source Variables</u>

Name	Type	Function/Remarks
AO	L*1	AO Model option -- =T, AO Model is active =F, AO Model is not active Set on &OPTION statement. Resides in JSRGP COMMON block.
NAO4	I*4	Number of AO levels each household -- =3 if AO=T =1 if AO=F
AUTOS(NAO4)	R*4	Number of autos at each active AO level. If AO=T -- AUTOS(1)=0.0 AUTOS(2)=1.0 AUTOS(3)=AO2 (from &SRGP statement). If AO=F -- AUTOS(1)=BASEO, the observed household AO from the HH/WORK file
PAO(NAO4)	R*4	Probability of each active AO level. If AO=T, then PAO contains output of AO model. If AO=F, then PAO(1)=1.0. Resides in JSRGP COMMON.

program to regurgitate all its internal processes on the printer: TESTA, TESTB, TESTC, TESTD, and TESTF. These LOGICAL variables control the dumping of data at each corresponding MODE13 entry point and in all the routines which are descendant from each entry point. The programmer will need the SRGP source code in hand to interpret the output that is produced when these options are requested. TESTD=T on the &OPTION statement should only be specified when a very small number of households and/or destinations are input to the program, and strictly for test purposes, because the amount of output that is produced can be tremendous.

MODIFYING SRGP

Subroutines DATA, which reads the HHWORK file, and IMPACT, which processes all the model results, are meant to be modified easily. DATA can be altered to represent policies which cannot be asserted with the ordinary SRGP policy control statements. IMPACT can be expanded to report additional details on some particular facet of the travel demand or impact pattern. The reader is referred to the source code for further information. (The non-work LOS matrix data is not made readily accessible in SRGP (although it is not very hard to get at in SHOPSR) because it is in UTPS format and can be easily manipulated with programs UMATRIX or UMCON.)

LINKAGE EDITOR CONTROL STATEMENTS

SRGP does not really have an overlay structure; however UMODEL does. The Linkage Editor control statements (SYSIN file) shown in Table V-5 will create the necessary UMODEL structure.

TABLE V-5

SRGP Linkage Editor Control Statements

```
REPLACE DFALT1,DFALT2,DFALT3,DFALT4,DFLT4A,DFLT4B,DFLT4C,DFLT4D
REPLACE DFLT4E,DFLT4F,DFLT4G,DFLT4H,DFLT4I
INCLUDE PROGLIB(UMODEL)
OVERLAY A
 INSERT SETBIT
  OVERLAY B
   INSERT SIGNON,DATE
  OVERLAY B
   INSERT MODEL1
  OVERLAY B
   INSERT MODEL2,ZDEQ,COMP
OVERLAY A
 INSERT MODEL9,UMPLOT,GRAPHS,PLOT1,PLOT2,PLOT3,PLOT4,PLOTIT,MAKFMT
 INSERT NXTLBC,SPREAD,GETA1,AND,OR
OVERLAY A
 INSERT MODEL3,MODE10,MODE11,MODE12,MODE14,UJIN,UJOUT
  OVERLAY B
   INSERT UJREAD
  OVERLAY B
   INSERT UJWRT
  OVERLAY B
   INSERT UJRWD
  OVERLAY B
   INSERT UPRNT
  OVERLAY B
   INSERT SORT
OVERLAY A
 INSERT MODEL4,HSORT
OVERLAY A
 INSERT MODEL5
OVERLAY A
 INSERT MODEL7
OVERLAY A
 INSERT MODEL8,MODL8A
ENTRY MAIN
NAME UMODEL
```

SRGP INSTALLATION

SRGP is delivered as several files on a computer tape. These files allow the user to execute SRGP on test data or real data or to create a new version of SRGP. The tape characteristics are described in the tape log, provided as Table V-6. The following points should be noted:

1. SRGP has been developed on an IBM 370/155 operating under full OS. As such, it is intended to be used in a compatible IBM environment only. The SRGP load module requires a minimum of 208K bytes for execution. Additional core that is dynamically allocated is a function of problem size, which models are run, and the blocksizes of input datasets. As an example, running all models on a 274 zone system required 272K bytes of memory.

2. The tape was prepared using the IBM utility IEHMOVE which transferred the files from disk packs. IEHMOVE can be used to restore the files to disk.

3. Although some files can be assessed directly from the tape (source decks, linkage editor control cards, zonal data file), the recommendation is that they all be moved to disk.

4. It is not strictly necessary to have UTPS programs available where SRGP is used. They can be useful, however, particularly in preparing the non-work LOS matrices which are in a binary format which is used by UTPS programs.

5. The first file contains source code for MODE13 and all routines descendent from it. The remainder of the program is the UTPS program, UMODEL (version 30 MAY 75), which is available from UMTA only in load module form. Either this version or more recently UMTA-distributed versions of UMODEL can be used to execute SRGP. (It should be noted that the 30 MAY 75 version contains an error which can affect the reading of UTPS matrices in "compressed format". For this reason, it is recommended that the non-work level-of-service file, as distributed, be converted to UTPS 4-byte binary format by UTPS program UMATRIX, if replicable results are desired using the test data.)

TABLE V-6

SRGP Delivery Tape

Volume __CSI094__

Page __1__

Manuf./Model __MEMOREX__   Length __600'__   Tracks __9__

Density __1600 bpi__   Acquired _____   Owned by _____

Seq # __1__   Name __SRGP.SOURCE__

LABEL __SL__ JOB ____ DSORG __PS__ RECFM __FB__ LRECL __80__ BLKSIZE __3120__

Description: Source for SRGP (FORTRAN IV-H)

Format: EBCDIC

Seq # __2__   Name __SRGP.LKED__

LABEL __SL__ JOB ____ DSORG __PS__ RECFM __FB__ LRECL __80__ BLKSIZE __800__

Description: Linkage Edit Control Cards

Format: EBCDIC

Seq # __3__   Name __SRGP.LM__

LABEL __SL__ JOB ____ DSORG __PS__ RECFM __FB__ LRECL __80__ BLKSIZE __800__

Description: Load Module for SRGP in unloaded PDS form

Format: RECFM = U, LRECL = ____ ; BLKSIZE = 13030 , ON IBM 3330

Seq # __4__   Name __SRGP.ZDATA__

LABEL __SL__ JOB ____ DSORG __PS__ RECFM __FB__ LRECL __92__ BLKSIZE __9200__

Description: Zonal Data for 440 Zones

Format: EBCDIC

Seq # __5__   Name __SRGP.HHFILE__

LABEL __SL__ JOB ____ DSORG __PS__ RECFM __VBS__ LRECL __32767__ BLKSIZE __2000__

Description: HOUSEHOLD/WORKER/WORK TRIP DATA FOR 750
HOUSEHOLDS with home zones ranging from 1 to 440.

Format: BINARY

Volume ___CSI094___

Page___2___

Manuf./Model _____ Length _____ Tracks _____

Density _____ Acquired _____ Owned by _____

Person responsible for tape and tape log:_____

Seq # __6__ Name __SRGP.NWLOS_____

LABEL __SL__JOB _____ DSORG _PS_ RECFM__VBS___ LRECL_1604__ BLK SIZE_1608_

Description: Non-work LOS matrices for origins 1 through 10,
destinations 1 through 440. This file should be
converted to UTPS 4-byte binary format before use.

Format: BINARY UTPS MATRIX _____

Seq # ___7__ Name __SRGP.EXAMPLE_____

LABEL __SL_JOB _____ DSORG _PS_ RECFM__FB___ LRECL_80__ BLK SIZE_800__

Description: Card deck for running example problem.

Format: EBCDIC _____

Seq # _____ Name _____

LABEL _____JOB _____ DSORG _____ RECFM_____ LRECL_____ BLK SIZE____

Description:

Format: _____

Seq # _____ Name _____

LABEL _____JOB _____ DSORG _____ RECFM_____ LRECL_____ BLK SIZE____

Description:

Format: _____

Seq # _____ Name _____

LABEL _____ JOB _____ DSORG _____ RECFM_____ LRECL_____ BLK SIZE____

Description:

Format: _____

VI. EXAMPLE RUNS

EXAMPLE DECK SETUP

The control cards shown on the following two pages execute the example included on the delivery tape, along with all the data needed to run the example. The example shows all the SRGP files used except for the BASEI and BASEO files. The example illustrates the execution of the work, shop, and social/recreational models. In addition, the following SRGP control variables are changed:

- gas price,

- car ownership costs,

- auto occupancy for non-work trips, and

- one of the coefficients in the work model.

In addition, UMODEL control cards are used to:

- indicate the locations of zonal data,

- indicate that there are 440 zones,

- select only the households from the first 10 zones for modelling (all 440 destinations are modelled),

- define all zones to be in one district. This allows the user to easily specify changes that affect all origins and all O-D pairs on the &U_____ update cards.

```
// JOB
//*
//*     THIS IS AN EXAMPLE SRGP RUN
//*
//*     NOTE THAT THE NAME OF THE ENTRY POINT IN THE MODULE IS 'UMODEL'
//*
//JSRGP  EXEC PGM=UMODEL,REGION=320K,TIME=(1)
//*     DEFINE WHERE THE PROGRAM IS
//STEPLIB  DD   DSN=WYL.AR.REN.SRGPFW4,DISP=SHR
//*     ZONAL DATA - ALL ON ONE 'A FILE'
//A1  DD DSN=WYL.AR.JRS.MTC.ZONE440.WES,DISP=SHR,UNIT=3330,
//        VOL=SER=WYL002
//*     PRINTED OUTPUT
//FT06F001  DD   SYSOUT=A
//*     NONWORK LOS
//FT11F001 DD DSN=WYL.AR.REN.MTC.LOSF10,DISP=SHR
//*      HOUSEHOLD/WORK TRIP FILE
//FT03F001  DD   DSN=WYL.AR.JRS.MTC.HHFILE.SAM750,DISP=SHR,
//            UNIT=3330,VOL=SER=WYL002
//*     SCRATCH DATASETS CAN BE DEFINED VERY EASILY
//FT20F001  DD   UNIT=SYSDA,SPACE=(TRK,(1,1))
//FT22F001  DD   UNIT=SYSDA,SPACE=(TRK,(1,1))
//FT02F001  DD   UNIT=SYSDA,SPACE=(TRK,(1,1))
//FT21F001  DD   DUMMY
//*     UMODEL CONTROL CARDS
//FT05F001  DD   *
(SRGPT1) SRGP TEST CASE 1 - ALL MODELS ON, FIRST 10 HOME ZONES ONLY
        THE CARD ABOVE IS A TITLE CARD TO APPEAR ON THE PRINTOUT.
        ANY CARDS THAT FOLLOW IT, LIKE THESE, ARE ECHO PRINTED FOR
        THE USER TO INSERT HIS COMMENTS.  NOTE THAT THE COMMENTS MAY
        ALSO BE INSERTED BETWEEN THE NAMELISTS.

        DEFINE 440 ZONES AND 1 DISTRICT
 &PARAM ZONES=440,DISTS=1 &END
        CHOOSE ONLY THE FIRST 10 HOME ZONES TO MODEL.
 &SELECT I=1,-10, &END
        PUT ALL ZONES INTO 1 DISTRICT FOR EASE OF APPLYING UPDATES.
 &EQUIV DIST=1,Z=1,-440        &END
        ZONAL DATA ID CARDS FOLLOW.
 &DATA
 01 A      01   01 01 1              CBD DUMMY
 02 A      02   03 02 1              DIST NO
 03 A      04   10 03 1              RJOBS
 04 A      11   17 04 1              SJOBS
 05 A      18   24 05 1              ACRES
 06 A      25   32 06 1              PACRES
 07 A      33   40 07 1              POP
 08 A      41   43 08 1              VPRKWO
 09 A      44   46 09 1              VPRKWD
 10 A      47   49 10 1              VWLKWO
```

(CONTINUED)

```
11 A       50    52 11 1                    VWLKWD
12 A       53    55 12 1                    VPRKSO
13 A       56    58 13 1                    VPRKSD
14 A       59    61 14 1                    VWLKSO
15 A       62    64 15 1                    VWLKSD
16 A       65    67 16 1                    SPRKWO
17 A       68    70 17 1                    SPRKWD
18 A       71    73 18 1                    SWLKWO
19 A       74    76 19 1                    SWLKWD
20 A       89    92 20 1                    ZONE NUMBER
21 X     1001
22 X     1002
23 X     1003
24 X     1004
25 X     1005
//*
//*      SRGP CONTROL CARDS
//*
//FT01F001  DD  *
         THESE ARE ADDITIONAL COMMENT CARDS.

         THIS RUN USES ALL THE MODELS (AO, WORK, SHOP, AND SOC/REC) IN
         A RUN THAT INCREASES THE PEAK AUTO INVEHICLE TRAVEL TIMES
         BY 10 PERCENT. NOTE THAT NOTHING IS ENTERED ON THE &SRGP NAMELIST.

   &SRGP   &END
   &OPTION AO=T,SHOP=T,SR=T,WORK=T,   &END
   &UWORK ODIST=1, DDIST=1, FAC(4)=1.10, FAC(13)=1.10, &END
   /*
```

EXAMPLE SRGP OUTPUTS

The following pages contain a complete set of the outputs produced by the example run.

```
***
***     THIS IS AN EXAMPLE SRGP RUN
***
***     NOTE THAT THE NAME OF THE ENTRY POINT IN THE MODULE IS 'UMODEL'
***
//JSRGP   EXEC PGM=UMODEL,REGION=320K,TIME=(1)
***     DEFINE WHERE THE PROGRAM IS
//STEPLIB  DD  DSN=WYL.AR.REN.SRGPFW4,DISP=SHR
***     ZONAL DATA - ALL ON ONE 'A FILE'
//A1  DD DSN=WYL.AR.JRS.MTC.ZONE440.WES,DISP=SHR,UNIT=3330,
//        VOL=SER=WYL002
***     PRINTED OUTPUT
//FT06F001  DD  SYSOUT=A
***     NONWORK LOS
//FT11F001 DD DSN=WYL.AR.REN.MTC.LOSF10,DISP=SHR
***      HOUSEHOLD/WORK TRIP FILE
//FT03F001   DD  DSN=WYL.AR.JRS.MTC.HHFILE.SAM750,DISP=SHR,
//            UNIT=3330,VOL=SER=WYL002
***     SCRATCH DATASETS CAN BE DEFINED VERY EASILY
//FT20F001   DD  UNIT=SYSDA,SPACE=(TRK,(1,1))
//FT22F001   DD  UNIT=SYSDA,SPACE=(TRK,(1,1))
//FT02F001   DD  UNIT=SYSDA,SPACE=(TRK,(1,1))
//FT21F001   DD  DUMMY
***     UMODEL CONTROL CARDS
//FT05F001   DD  *
***
***     SRGP CONTROL CARDS
***
//FT01F001   DD  *
***ROUTE PRINT RMT2                                                      WYL
***ROUTE PUNCH RMT2                                                      WYL
//                                                                       //
IEF236I ALLOC. FOR ARREN425 JSRGP
IEF237I 150    ALLOCATED TO STEPLIB
IEF237I 155    ALLOCATED TO A1
IEF237I 810    ALLOCATED TO FT06F001
IEF237I 150    ALLOCATED TO FT11F001
IEF237I 155    ALLOCATED TO FT03F001
IEF237I 15C    ALLOCATED TO FT20F001
IEF237I 15C    ALLOCATED TO FT22F001
IEF237I 154    ALLOCATED TO FT02F001
IEF237I 910    ALLOCATED TO FT05F001
IEF237I 915    ALLOCATED TO FT01F001
IEF142I - STEP WAS EXECUTED - COND CODE 0000
IEF285I    WYL.AR.REN.SRGPFW4                          KEPT
IEF285I    VOL SER NOS= WYL001.
IEF285I    WYL.AR.JRS.MTC.ZONE440.WES                  , KEPT
IEF285I    VOL SER NOS= WYL002.
IEF285I    WYL.AR.REN.MTC.LOSF10                       KEPT
IEF285I    VOL SER NOS= WYL001.
IEF285I    WYL.AR.JRS.MTC.HHFILE.SAM750                KEPT
IEF285I    VOL SER NOS= WYL002.
IEF285I    SYS77354.T052219.RV000.ARREN425.R0001851    DELETED
IEF285I    VOL SER NOS= TS2168.
IEF285I    SYS77354.T052219.RV000.ARREN425.R0001852    DELETED
IEF285I    VOL SER NOS= TS2168.
IEF285I    SYS77354.T052219.RV000.ARREN425.R0001853    DELETED
IEF285I    VOL SER NOS= D33308.
IEF373I STEP /JSRGP   / START 77354.1313
IEF374I STEP /JSRGP   / STOP  77354.1347 CPU    0MIN 53.58SEC STOR VIRT 284K
```

```
*
***************************** GO*PAC V08 L04.0 STEP ACCOUNTING BLOCK *****
* STEP 001      CC = 0000       CPUTIME = 000053.58 SEC        STARTED - 13.13.27
*
*                               PROGRAM NAME = UMODEL
*
* H0 KBYTES REQ/USED = 0320/0284                        MOUNTS TAPE/2314/33?
* H1 KBYTES REQ/USED = 0000/0000
*
* TAPE EXCP = 00000000                                       3330 EXCP = 000
* 2314 EXCP = 00000000                                       3331 EXCP = 000
*
* CARDS READ = 00000052         CARDS PUNCHED = 00000000         LINES PRINTE
*
*                       TOTAL I/O CHANNEL TIME = 0000.10 MIN
*
* CH00- 0000.00    CH01- 0000.10    CH02- 0000.00    CH03- 0000.00    CH04- 0000
* CH06- 0000.00    CH07- 0000.00    CH08- 0000.00
****************************************************************************
*
IEF375I   JOB /ARREN425/ START 77354.1313
IEF376I   JOB /ARREN425/ STOP  77354.1347 CPU    0MIN 53.58SEC
*
***************************** GO*PAC  V08 L04.0 JOB ACCOUNTING BLOCK *****
* JOB  ARREN425       DATE = 77.354      STARTED - 13.13.27      ENDED - 13.47.4
*
* CARDS READ = 000082       CARDS PUNCHED = 00000      LINES PRINTED = 000747
*
*  CPU TIME              CHAN TIME              CORE OCCUPANCY (H0)            C
* 0000.89 MIN            00000.10 MIN              00005.32 KBYTE*HRS          (
*
* TAPE EXCP = 00000000                                       3330 EXCP = 000
* 2314 EXCP = 00000000                                       3331 EXCP = 000
*
* TAPE UNIT OCCUPANCY = 000.00 HRS                           PRIVATE 2314 00
* MOUNTS TAPE/2314/3330/3331 = 00/00/00/00                   PRIVATE 3330 00
* OPERATOR ACTIVITES -        00                             PRIVATE 3331 00
*
* ACCOUNT = 8526007                                          SYSTEM - 370/1£
*
*               ESTIMATED CHARGE FOR THIS JOB INCLUDING MOUNT CHARGES I£
*                        0000.99 COMPUTER RESOURCE UNITS
*                                 $00008.41
*
******************************************* VS RELEASE   01.7 ****************
*
```

U R B A N   T R A N S P O R T A T I O N   P L A N N I N G   S Y S T E M

20DEC77 13.13.40   UMODEL   PAGE   1

SIGNON 001 (INFORMATION): UMODEL   (30MAY75) BEGIN AT 13.13.40

SIGNON 1800 (WARNING): FILE URD.LOG NOT AVAILABLE.

SIGNON 002 (INFORMATION): CONTROL CARD IMAGES

```
         1   1   2   2   3   3   4   4   5   5   6   6   7
1---5----0----5----0----5----0----5----0----5----0----5----0----5----0--
(SRGPT1) SRGP TEST CASE 1 - ALL MODELS ON, FIRST 10 HOME ZONES ONLY
        THE CARD ABOVE IS A TITLE CARD TO APPEAR ON THE PRINTOUT.
        ANY CARDS THAT FOLLOW IT, LIKE THESE, ARE ECHO PRINTED FOR
        THE USER TO INSERT HIS COMMENTS.  NOTE THAT THE COMMENTS MAY
        ALSO BE INSERTED BETWEEN THE NAMELISTS.

        DEFINE 440 ZONES AND 1 DISTRICT
 &PARAM ZONES=440,DISTS=1 &END
        CHOOSE ONLY THE FIRST 10 HOME ZONES TO MODEL.
 &SELECT I=1,-10, &END
        PUT ALL ZONES INTO 1 DISTRICT FOR EASE OF APPLYING UPDATES.
 &EQUIV DIST=1,Z=1,-440             &END
        ZONAL DATA ID CARDS FOLLOW.
 &DATA
1---5----0----5----0----5----0----5----0----5----0----5----0----5----0--
         1   1   2   2   3   3   4   4   5   5   6   6   7
```

JSRGP(03MAY77) BEGIN.   JSYSIN CONTROL CARDS

```
         1   1   2   2   3   3   4   4   5   5   6   6   7 7
----5----0----5----0----5----0----5----0----5----0----5----0----5----0-2
        THESE ARE ADDITIONAL COMMENT CARDS.

        THIS RUN USES ALL THE MODELS (AO, WORK, SHOP, AND SOC/REC)  IN
        A RUN THAT INCREASES THE PEAK AUTO INVEHICLE TRAVEL TIMES
        BY 10 PERCENT. NOTE THAT NOTHING IS ENTERED ON THE &SRGP NAMELIST.

 &SRGP  &END
 &OPTION AO=T,SHOP=T,SR=T,WORK=T,  &END
 &UWORK ODIST=1, DDIST=1, FAC(4)=1.10, FAC(13)=1.10, &END
----5----0----5----0----5----0----5----0----5----0----5----0----5----0-2
         1   1   2   2   3   3   4   4   5   5   6   6   7 7
```

```
&SRGP
  GAS   =   32.40   PRICE OF GAS IN CENTS/GAL.
  AO2   =    2.12   AVERAGE AUTOS PER HOUSEHOLD IN HIGHEST
                    LEVEL OF AUTO OWNERSHIP
  AOCSH =    2.50   AUTO OCCUPANCY FOR AUTO SHOP TRIPS
  AOCSR =    2.50   AUTO OCCUPANCY FOR AUTO SOC/REC TRIPS
  AWSROC=    1.00   AUTO OCCUPANCY FOR WORK TRIP SHARED RIDE
                    WHEN THE SHARED RIDE OCCUPANCY MODEL IS BYPASSED.
  CAROWN= 1000.0   ANNUAL CAR OWNERSHIP COST IN DOLLARS
  TSCALE=   10.00   SCALE FACTOR FOR OUTPUT TRIPS TABLES
  RSHOP = 999.00   MAXIMUM DISTANCE ALLOWED FOR SHOP TRIPS
  RSR   = 999.00   MAXIMUM DISTANCE ALLOWED FOR S/R TRIPS
```

```
   OWDA   =        0   WORK DRIVE ALONE PERSONS OUTPUT TABLE NUMBER
   OWSHRP=          0   WORK SHARED RIDE PERSONS OUTPUT TABLE NUMBER
   OWQ    =         0   WORK TRANSIT TOT. PERSONS OUTPUT TABLE NUMBER
   OWSHRV=          0   WORK SHARED RIDE VEHICLES OUTPUT TABLE NUMBER
   OWQR   =         0   WORK PARK-RIDE PERSONS OUTPUT TABLE NUMBER
   OSHOPP=          0   SHOP AUTO PERSONS OUTPUT TABLE NUMBER
   OSHOPQ=          0   SHOP TRANSIT PERSONS OUTPUT TABLE NUMBER
   OSRP   =         0   SOC-REC AUTO PERSONS OUTPUT TABLE NUMBER
   OSRQ   =         0   SOC-REC TRANSIT PERSONS OUTPUT TABLE NUMBER
   OSHOPV=          0   SHOP AUTO VEHICLES OUTPUT TABLE NUMBER
   OSRV   =         0   SOC-REC AUTO VEHICLES OUTPUT TABLE NUMBER
   OWHC   =         0   WORK HC EMISSIONS OUTPUT TABLE NUMBER
   OWCO   =         0   WORK CO EMISSIONS OUTPUT TABLE NUMBER
   OWNX,  =         0   WORK NOX EMISSIONS OUTPUT TABLE NUMBER
   OSSHC  =         0   NON-WORK HC EMISSIONS OUTPUT TABLE NUMBER
   OSSCO  =         0   NON-WORK CO EMISSIONS OUTPUT TABLE NUMBER
   OSSNX  =         0   NON-WORK NX EMISSIONS OUTPUT TABLE NUMBER
&END


&OPTION
   WORK   =         T   TO PERFORM WORK MODEL (T)
   SHOP   =         T   TO PERFORM SHOP MODEL (T)
   SR     =         T   TO PERFORM SOC/REC MODEL (T)
   AO     =         T   TO PERFORM AO   MODEL (T)
   RDBASE=          F   TO READ A BASE IMPACT FILE AND COMPARE (F)
   WRBASE=          F   TO WRITE AN IMPACT FILE FOR LATER USE (F)
&END
```

```
&CMODEL
  CFWORK=0.13700E-04 -1.0670       -.34700      0.32700      -.12200E-01
         -.33500E-01 -.15500       -.10700E-01 -.30200E-01 -21.430
          1.9580      1.3890        1.7630      0.67700     -1.2370
         -2.5110     -3.4730
  CFSHRO= 2.5420      -.47170E-04  0.11160E-01
  CFSHOP=-.86310      0.89120       -.63370      5.0530      -.20200
         -.24470E-01 -.22990E-01  0.59950E-03  1.0000
  CFSHG =0.81940      0.77660E-01  -.34170      -.51500E-01 0.11460
         -.52700E-01
  CFSR  = 1.8440      1.1900        -1.4050      2.1670      0.33680
         -.10970     -.25600E-01   -.10800E-01 0.24400E-01 0.60900E-01
          0.69980     1.0000
  CFSRG =0.14390      0.46710       0.39630      -.38390      0.50550E-02
          0.67850E-01
  CFAON =-.86950      -8.3570       0.60700      0.31880      1.2270
         -.68200E-01
  CFAO  = 4.9890      5.6890        0.39350      1.3420      -.54190E-01
         -2.6890     -2.6890        0.56080      0.68140E-01 0.79190
&END
```

JSRGP(ECHOA) END OF JSYSIN CONTROL STATEMENTS.

```
&PARAM
  ZONES =  440       HIGHEST ZONE NUMBER
  DISTS =    1       HIGHEST DISTRICT NUMBER
  DIMENS=    0       NUMBER OF DIMENSIONS IN CURVE TABLE
  LEVEL(N)=  1  1  1  1  1  1  1     NUMBER OF STRATIFICATIONS
  TABOUT=    0       NUMBER OF INTERCHANGE TRIP MATRICES OUTPUT
  TESUM(N)=  0  0  0  0  0   NUMBER OF TABLES PER TRIP END SUMMARY (N)
  TRESID=    0       NUMBER OF CURVE TABLE TRIP SUMMARIES
  IRESID(N)= 0  0  0  0  0  0  0  0  0  0   POINTERS FOR
             0  0  0  0  0  0  0  0  0  0   INTERCHANGE
                                           RESIDUAL REPORT
  ITER  =    0       NUMBER OF ITERATIONS
  NUMF  =    0       NUMBER OF F-FACTOR CURVES TO BE GENERATED
  MAXT  =    0       MAXIMUM TIME FOR F-FACTOR GENERATION
  GENT  =    0       GENERATE I/O FILES
&END

&OPTION
  DONLY =    F       TO PRINT DISTRICT SUMMARIES ONLY (REPT 4)(F)
  HALFWD=    F       TO STORE TRIP TABLES IN HALFWORDS (F)
  IGNORE=    F       TO IGNORE READ CHECKS ON MATRIX DATA SETS (F)
  STATS =    F       TO CALCULATE VARIABLE STATISTICS(F)
  DRYRUN=    F       TO MAKE A "DRY RUN" (F)
&END
```

(SRGPT1) SRGP TEST CASE 1 - ALL MODELS ON, FIRST 10 HOME ZONES ONLY.

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D A T A   F I L E   S U M M A R Y

FILE NAME	DSNAME	CREATION DATE	VOLUME	UNIT	DDNAME	BUFFERS NO	SIZE
J1	WYL.AR.REN.MTC.LOSF10	11NOV77	WYL001	3330	FT11F001	2	1608
A1	WYL.AR.JRS.MTC.ZONE440 J.WES	07NOV77	WYL002	3330	A1	2	9200

UMODEL 002 (INFORMATION): CORE ALLOCATION DATA FOR PRODUCTION RUN:
                          125000 BYTES FOR PROGRAM   (123K)
                           18400 BYTES FOR BUFFERS   (18K)
                           44536 BYTES FOR TABLES   (44K)
                          FOR A MAXIMUM REGION SIZE OF 184K BYTES

(SRGPT1) SRGP TEST CASE 1 - ALL MODELS ON, FIRST 10 HOME ZONES ONLY

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MODEL2 2001 (INFORMATION): DATA IDENTIFICATION CARDS:

```
              1    1    2    2    3    3    4    4    5    5    6    6    7
----5----0----5----0----5----0----5----0----5----0----5----0----5----0--
  01 A    01   01 01 1                   CBD DUMMY
  02 A    02   03 02 1                   DIST NO
  03 A    04   10 03 1                   RJOBS
  04 A    11   17 04 1                   SJOBS
  05 A    18   24 05 1                   ACRES
  06 A    25   32 06 1                   PACRES
  07 A    33   40 07 1                   POP
  08 A    41   43 08 1                   VPRKWO
  09 A    44   46 09 1                   VPRKWD
  10 A    47   49 10 1                   VWLKWO
  11 A    50   52 11 1                   VWLKWD
  12 A    53   55 12 1                   VPRKSO
  13 A    56   58 13 1                   VPRKSD
  14 A    59   61 14 1                   VWLKSO
  15 A    62   64 15 1                   VWLKSD
  16 A    65   67 16 1                   SPRKWO
  17 A    68   70 17 1                   SPRKWD
  18 A    71   73 18 1                   SWLKWO
  19 A    74   76 19 1                   SWLKWD
  20 A    89   92 20 1                   ZONE NUMBER
  21 X  1001
  22 X  1002
  23 X  1003
  24 X  1004
  25 X  1005
----5----0----5----0----5----0----5----0----5----0----5----0----5----0--
       1    1    2    2    3    3    4    4    5    5    6    6    7
```

MODEL3 3039 (INFORMATION): NAME OF TABLE 1001 IS MATRIX T 001

MODEL3 3039 (INFORMATION): NAME OF TABLE 1002 IS MATRIX T 002

MODEL3 3039 (INFORMATION): NAME OF TABLE 1003 IS MATRIX T 003

MODEL3 3039 (INFORMATION): NAME OF TABLE 1004 IS MATRIX T 004

MODEL3 3039 (INFORMATION): NAME OF TABLE 1005 IS MATRIX T 005

```
JSRGP(MOD13F) END OF HH FILE AFTER RECORD      15
              NUMBER OF HH'S SKIPPED            0
              NUMBER OF WORK TRIPS READ        20
```

NON-WORK TRIP LENGTH DISTRIBUTION (MILES)

	0-1	1-2	2-3	3-4	4-5	5-6
	10-11	11-12	12-13	13-14	14-15	15

SHOP:

TOTAL TRIPS	0.0	8628.43	4963.34	6216.98	861.87	1665.05
	491.57	252.06	223.13	260.57	241.41	343

FRACTION	0.0	0.3067	0.1764	0.2210	0.0306	0.0592
	0.0175	0.0090	0.0079	0.0093	0.0086	0.0

CUMULATIVE	0.0	0.3067	0.4832	0.7042	0.7348	0.7940
	0.9024	0.9114	0.9193	0.9286	0.9372	0.9

S/R:

TOTAL TRIPS	0.0	1273.23	596.66	633.21	235.73	312.43
	386.67	483.82	140.37	348.25	991.54	988

FRACTION	0.0	0.1371	0.0642	0.0682	0.0254	0.0336
	0.0416	0.0521	0.0151	0.0375	0.1068	0.1

CUMULATIVE	0.0	0.1371	0.2013	0.2695	0.2949	0.3285
	0.4391	0.4912	0.5063	0.5438	0.6505	0.7

DESCRIPTION OF IMPACT VARIABLES

LABEL	DESCRIPTION

(HOUSEHOLD)

NHH	NUMBER OF HOUSEHOLDS
INCOME	HOUSEHOLD INCOME
NPER	HOUSEHOLD SIZE (NUMBER OF PERSONS)
AO	HOUSEHOLD AUTO OWNERSHIP
NWORK	NUMBER OF WORKERS

(WORK TRIP)

NWRK TRP	NUMBER OF WORK TRIPS
DR ALONE	NUMBER (OR MODESHARE) OF DRIVE ALONE
SHARED	NUMBER (OR MODE SHARE) OF SHARED RIDE
TRANSIT	NUMBER (OR MODE SHARE) OF TRANSIT
VANPOOL	NUMBER (OR MODE SHARE) OF VANPOOL
POOLS	NUMBER OF CARPOOLS AMONG SHARED RIDERS
VEH TRIP	AUTO VEH TRIPS IN DRIVE ALONE AND SHARED RIDE
DIST	WORK TRIP LENGTH USING DRIVE ALONE DISTANCE FOR ALL THREE MODES
WORK VMT	VEHICLE MILES BY DRIVE ALONE AND SHARED RIDE
WRK FUEL	FUEL CONSUMMED ON WORK TRIPS (GALLONS/DAY)
WORK HC	WORK TRIP HYDROCARBON EMISSIONS (KG)
WORK CO	WORK TRIP CARBON MONOXIDE EMISSIONS (KG)
WORK NOX	WORK TRIP NITROGEN OXIDE EMISSIONS (KG)

(NON-WORK TRIPS)

SHP TRIP	NUMBER OF SHOP PERSON TRIPS
SRP TRIP	NUMBER OF SOCIAL/RECREATIONAL PERSON TRIPS
SHV TRIP	NUMBER OF SHOP VEHICLE TRIPS
SRV TRIP	NUMBER OF SOCIAL/RECREATIONAL VEHICLE TRIPS
DIST	AVERAGE ONE-WAY DISTANCE (MILES)
NW VMT	VEHICLE MILES TRAVELLED
NW FUEL	FUEL CONSUMMED ON NW TRIPS (GALLONS/DAY)
NW HC	NW TRIP HYDROCARBON EMISSIONS (KG)
NW CO	NW TRIP CARBON MONOXIDE EMISSIONS (KG)
NW NOX	NW TRIP NITROGEN OXIDE EMISSIONS (KG)

(TOTAL)

TOT VMT	TOTAL VEHICLE MILES TRAVELED
FUEL CON	TOTAL FUEL CONSUMMED (GALLONS/DAY)
HC POLL	TOTAL HYDROCARBON EMISSIONS (KG)
CO POLL	TOTAL CARBON MONOXIDE EMISSIONS (KG)
NX POLL	TOTAL NITROGEN OXIDES EMISSIONS (KG)
CBD VEH	NW VEHICLE TRIPS TO CBD
CBD PER	NW PERSON TRIPS TO CBD

DESCRIPTION OF MARKET SEGMENTS

LABEL	DESCRIPTION
LOW INC	HOUSEHOLDS WITH ANNUAL INCOME LESS THAN $7500
MID INC	HOUSEHOLDS WITH ANNUAL INCOME $7500 - $15000
HIGH INC	HOUSEHOLDS WITH ANNUAL INCOME GT $15000
URBAN RZ	HOUSEHOLDS RESIDING IN URBAN AREAS
SBURB RZ	HOUSEHOLDS RESIDING IN SUBURBAN AREAS
EXURB RZ	HOUSEHOLDS RESIDING IN EXURBAN AREAS
AO=0	HOUSEHOLDS WITH ZERO AUTOS AVAILABLE
AO=1	HOUSEHOLDS WITH ONE AUTO AVAILABLE
AO=2	HOUSEHOLDS WITH TWO OR MORE AUTOS AVAILABLE
TOTAL	ALL HOUSEHOLDS

DESCRIPTION OF REPORTS

TOTAL IMPACTS: VALUES OF VARIABLES AS ACCUMULATED USING
   APPROPRIATE EXPANSION FACTORS

AVERAGE VALUES: THIS REPORT DIVIDES THE VALUES REPORTED
   IN THE TOTAL IMPACTS REPORT BY THE TOTAL OF THE
   APPROPRIATE EXPANSION FACTORS BY MARKET SEGMENT. IN THE
   CASE OF THE COMBINED WORK AND NON-WORK TOTALS THE
   AVERAGING TOTAL USED IS THE SUM OF THE HOUSEHOLD
   EXPANSION FACTORS. THIS RESULTS IN A HOUSEHOLD AVERAGE
   FOR THESE IMPACTS.

PERCENTAGE CHANGES FROM BASE: THIS REPORT (PRINTED ONLY
   IF RDBASE=T) GIVES THE PERCENT CHANGES OF THE IMPACTS
   OF THE RUN RELATIVE TO A BASE SET.

TOTAL IMPACTS (EXPANDED)

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(HOUSEHOLD)				
NHH	1098.00	2369.00	4392.00	
	0.0	6761.00	1098.00	
	549.00	3294.00	4016.00	7859.00
INCOME	3683790.00	20658496.00	84666720.00	
	0.0	97123152.00	11885850.00	
	1043100.00	38040176.00	69925728.00	109008992.00
NPER	1647.00	8175.00	11529.00	
	0.0	18606.00	2745.00	
	549.00	7137.00	13665.00	21351.00
AO	904.23	3398.85	7106.12	
	0.0	9798.05	1611.14	
	129.44	4421.64	6858.11	11409.19
NWORK	1098.00	3640.00	6588.00	
	0.0	10228.00	1098.00	
	0.0	4392.00	6934.00	11326.00

TOTAL IMPACTS (EXPANDED)

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(WORK TRIP)	-------	-------	--------	-----
NWRK TRP	1178.00	2791.00	5224.00	
	0.0	8961.00	232.00	
	0.0	4169.00	5024.00	9193.00
DR ALONE	736.49	1355.61	2878.59	
	0.0	4804.61	166.07	
	0.0	2595.24	2375.45	4970.68
SHARED	359.02	1075.93	1644.12	
	0.0	3022.67	56.40	
	0.0	1335.85	1743.21	3079.06
TRANSIT	82.50	359.46	701.29	
	0.0	1133.70	9.54	
	0.0	237.91	905.33	1143.24
VANPOOL	0.0	0.0	0.0	
	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0
POOLS	130.35	372.07	653.33	
	0.0	1134.09	21.66	
	0.0	496.93	658.82	1155.75
VEH TRIP	866.84	1727.68	3531.92	
	0.0	5938.68	187.73	
	0.0	3092.17	3034.27	6126.41
DIST	5124.30	42007.52	101045.00	
	0.0	145392.69	2784.00	
	0.0	79691.25	68485.69	148176.63
WORK VMT	7906.52	46539.97	137286.19	
	0.0	187098.88	4633.44	
	0.0	120443.94	71288.83	191732.25
WRK FUEL	1152.70	4027.76	9984.43	
	0.0	14778.82	386.06	
	0.0	9208.59	5956.31	15164.87
WORK HC	117.81	403.70	951.69	
	0.0	1432.46	40.74	
	0.0	835.97	637.23	1473.20
WORK CO	2753.49	14495.79	12333.70	
	0.0	29036.11	546.85	
	0.0	20940.75	8642.21	29582.96
WORK NOX	29.49	164.39	538.61	
	0.0	715.73	16.75	
	0.0	474.57	257.91	732.48

TOTAL IMPACTS (EXPANDED)

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(NON-WORK TRIPS)	-------	-------	-------	-----
SHP TRIP	2316.35	8945.22	16873.28	
	0.0	24637.80	3495.17	
	941.88	9576.94	17614.39	28131.04
SRP TRIP	794.30	3152.94	5346.33	
	0.0	7876.48	1412.68	
	277.82	3516.40	5499.41	9287.93
SHV TRIP	682.33	3526.95	6738.12	
	0.0	9575.29	1370.03	
	150.10	3769.11	7028.55	10944.77
SRV TRIP	112.21	856.33	1748.91	
	0.0	2387.92	329.48	
	16.40	842.20	1858.80	2717.30
DIST	14262.15	20545.04	21377.79	
	0.0	46729.90	9455.07	
	8779.72	26550.36	20854.89	56184.97
NW VMT	7523.20	33182.55	36634.44	
	0.0	64397.77	12941.71	
	1891.42	32410.54	43037.84	77326.06
NW FUEL	506.17	2352.47	2899.99	
	0.0	4841.03	916.01	
	125.93	2318.09	3314.55	5754.51
NW HC	47.35	232.87	342.83	
	0.0	531.83	91.07	
	11.15	235.26	376.69	622.80
NW CO	626.60	3148.91	4904.18	
	0.0	7442.56	1234.12	
	143.90	3211.08	5325.37	8675.82
NW NOX	34.04	144.74	151.47	
	0.0	273.86	56.37	
	8.57	141.14	180.53	330.14
CBD VEH	45.18	183.73	189.59	
	0.0	321.43	97.05	
	10.19	226.46	181.85	418.46
CBD PER	493.76	873.43	818.65	
	0.0	1701.01	484.82	
	299.20	1106.76	779.89	2185.83

TOTAL IMPACTS (EXPANDED)

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(TOTAL)				
TOT VMT	15429.72	79722.50	173920.63	
	0.0	251496.63	17575.16	
	1891.42	152854.44	114326.69	269058.31
FUEL CON	1658.86	6380.23	12884.42	
	0.0	19619.85	1302.07	
	125.93	11526.68	9270.86	20919.38
HC POL	186.80	717.95	1464.64	
	0.0	2198.86	170.38	
	14.24	1177.08	1178.10	2369.13
CO POL	3380.09	17644.69	17237.87	
	0.0	36478.68	1780.97	
	143.90	24151.84	13967.58	38258.78
NX POL	63.53	309.12	690.07	
	0.0	989.59	73.13	
	8.57	615.71	438.44	1062.62

AVERAGE VALUES

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(HOUSEHOLD)				
NHH	0.14	0.30	0.56	
	0.0	0.86	0.14	
	0.07	0.42	0.51	1.00
INCOME	3355.00	8720.34	19277.48	
	0.0	14365.20	10825.00	
	1900.00	11548.32	17411.78	13870.59
NPER	1.50	3.45	2.63	
	0.0	2.75	2.50	
	1.00	2.17	3.40	2.72
AO	0.82	1.43	1.62	
	0.0	1.45	1.47	
	0.24	1.34	1.71	1.45
NWORK	1.00	1.54	1.50	
	0.0	1.51	1.00	
	0.0	1.33	1.73	1.44

AVERAGE VALUES

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(WORK TRIP)				
NWRK TRP	0.13	0.30	0.57	
	0.0	0.97	0.03	
	0.0	0.45	0.55	1.00
DR ALONE	0.63	0.49	0.55	
	0.0	0.54	0.72	
	0.0	0.62	0.47	0.54
SHARED	0.30	0.39	0.31	
	0.0	0.34	0.24	
	0.0	0.32	0.35	0.33
TRANSIT	0.07	0.13	0.13	
	0.0	0.13	0.04	
	0.0	0.06	0.18	0.12
VANPOOL	0.0	0.0	0.0	
	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0
POOLS	0.11	0.13	0.13	
	0.0	0.13	0.09	
	0.0	0.12	0.13	0.13
VEH TRIP	0.74	0.62	0.68	
	0.0	0.66	0.81	
	0.0	0.74	0.60	0.67
DIST	4.35	15.05	19.34	
	0.0	16.23	12.00	
	0.0	19.12	13.63	16.12
WORK VMT	6.71	16.68	26.28	
	0.0	20.88	19.97	
	0.0	28.89	14.19	20.86
WRK FUEL	0.98	1.44	1.91	
	0.0	1.65	1.66	
	0.0	2.21	1.19	1.65
WORK HC	0.10	0.14	0.18	
	0.0	0.16	0.18	
	0.0	0.20	0.13	0.16
WORK CO	2.34	5.19	2.36	
	0.0	3.24	2.36	
	0.0	5.02	1.72	3.22
WORK NOX	0.03	0.06	0.10	
	0.0	0.08	0.07	
	0.0	0.11	0.05	0.08

AVERAGE VALUES

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(NON-WORK TRIPS)	-------	-------	--------	-----
SHP TRIP	2.11	3.78	3.84	
	0.0	3.64	3.18	
	1.72	2.91	4.39	3.58
SRP TRIP	0.72	1.33	1.22	
	0.0	1.16	1.29	
	0.51	1.07	1.37	1.18
SHV TRIP	0.62	1.49	1.53	
	0.0	1.42	1.25	
	0.27	1.14	1.75	1.39
SRV TRIP	0.10	0.36	0.40	
	0.0	0.35	0.30	
	0.03	0.26	0.46	0.35
DIST	12.99	8.67	4.87	
	0.0	6.91	8.61	
	15.99	8.06	5.19	7.15
NW VMT	6.85	14.01	8.34	
	0.0	9.52	11.79	
	3.45	9.84	10.72	9.84
NW FUEL	0.46	0.99	0.66	
	0.0	0.72	0.83	
	0.23	0.70	0.83	0.73
NW HC	0.04	0.10	0.08	
	0.0	0.08	0.08	
	0.02	0.07	0.09	0.08
NW CO	0.57	1.33	1.12	
	0.0	1.10	1.12	
	0.26	0.97	1.33	1.10
NW NOX	0.03	0.06	0.03	
	0.0	0.04	0.05	
	0.02	0.04	0.04	0.04
CBD VEH	0.04	0.08	0.04	
	0.0	0.05	0.09	
	0.02	0.07	0.05	0.05
CBD PER	0.45	0.37	0.19	
	0.0	0.25	0.44	
	0.54	0.34	0.19	0.28

AVERAGE VALUES

IMPACT	MARKET SEGMENT			
	LOW INC URBAN RZ AO=0	MID INC SBURB RZ AO=1	HIGH INC EXURB RZ AO=2	TOTAL
(TOTAL)				
TOT VMT	14.05	33.65	39.60	
	0.0	37.20	16.01	
	3.45	46.40	28.47	34.24
FUEL CON	1.51	2.69	2.93	
	0.0	2.90	1.19	
	0.23	3.50	2.31	2.66
HC POL	0.17	0.30	0.33	
	0.0	0.33	0.16	
	0.03	0.36	0.29	0.30
CO POL	3.08	7.45	3.92	
	0.0	5.40	1.62	
	0.26	7.33	3.48	4.87
NX POL	0.06	0.13	0.16	
	0.0	0.15	0.07	
	0.02	0.19	0.11	0.14

AVERAGE VALUES FOR LEVEL OF SERVICE - WORK TRIP

DRIVE ALONE

AVAIL	IVTT	TOLLS	DIST	WALK	PK COST
1.000	55.000	0.0	8.700	0.0	0.0
1.000	100.133	25.429	30.102	3.170	108.125
1.000	97.849	25.201	38.685	1.779	55.161
0.0	0.0	0.0	0.0	0.0	0.0
1.000	93.567	21.472	32.450	1.972	65.834
1.000	73.150	44.000	24.000	2.000	0.0
0.0	0.0	0.0	0.0	0.0	0.0
1.000	105.188	19.135	38.230	1.093	20.690
1.000	82.981	24.452	27.263	2.703	100.255
1.000	93.052	22.041	32.237	1.973	64.172

SHARED RIDE

AVAIL	IVTT	TOLLS	DIST	WALK	PK COST
1.000	66.000	0.0	11.500	0.0	0.0
1.000	111.133	25.429	32.902	3.170	108.125
1.000	108.849	25.201	41.485	1.779	55.161
0.0	0.0	0.0	0.0	0.0	0.0
1.000	104.567	21.472	35.250	1.972	65.834
1.000	84.150	44.000	26.800	2.000	0.0
0.0	0.0	0.0	0.0	0.0	0.0
1.000	116.188	19.135	41.030	1.093	20.690
1.000	93.981	24.452	30.063	2.703	100.255
1.000	104.052	22.041	35.037	1.973	64.172

TRANSIT

AVAIL	IVTT	WALK	HEADWAY	WAIT	FARE	AUTO ACC (DUMMY)	AUTO (TR
1.000	20.000	24.000	40.000	0.0	70.000	0.0	0
1.000	69.402	26.604	32.275	0.595	80.557	0.0	0
1.000	72.802	30.321	25.302	12.755	139.196	0.0	0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1.000	65.702	28.366	29.440	7.311	112.592	0.0	0
1.000	38.000	30.000	24.000	12.000	110.000	0.0	0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1.000	81.380	30.538	32.338	3.559	127.400	0.0	0
1.000	51.414	26.639	26.783	10.640	100.184	0.0	0
1.000	65.003	28.407	29.302	7.429	112.526	0.0	0

AVERAGE VALUES FOR LEVEL OF SERVICE - NON WORK TRIPS

<-------------- AUTO -------------->				<--------- TRANSIT ------		
NO.DEST AVAIL	IVTT	DIST	TOLLS	NO.DEST AVAIL	TOTAL TIME	F
430.000	50.272	36.365	21.429	338.500	110.023	107
430.000	52.533	37.710	22.817	317.393	116.346	97
430.000	50.183	36.257	22.411	330.500	110.847	101
0.0	0.0	0.0	0.0	0.0	0.0	0
430.000	50.942	36.722	22.236	324.933	113.211	101
430.000	50.658	36.622	23.360	344.500	107.234	98
430.000	51.309	36.691	21.440	332.000	112.506	106
430.000	49.993	36.087	22.742	329.833	111.304	99
430.000	51.595	37.222	22.241	325.297	113.166	101
430.000	50.901	36.706	22.390	327.667	112.321	101

SINOFF 6700 (INFORMATION): UMODEL   ENDED AT 13.47.33 (RETURN CODE= 0)

SINOFF 7000 (WARNING): FILE URD.LOG NOT AVAILABLE.

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