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Final Report

A GUIDE TO TRANSPORTATION MODELING USING TRANPLAN FOR COMPUTER SIMULATION OF STRATEGIES FOR MANAGING THE RURAL ROAD INFRASTRUCTURE

by

D. Walter Halbach, Research Fellow
and
Jerry Fruin, Associate Professor

University of Minnesota
Department of Agricultural and Applied Economics

Sponsored by

The Center for Transportation Studies
University of Minnesota,

The Mountain-Plains Consortium
University Transportation Centers Program,

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St. Paul, Minnesota 55108

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EXECUTIVE SUMMARY

Strategies for Managing the Rural Road Infrastructure

July 1991

Jerry Fruin, Associate Professor
University of Minnesota
612-625-8720

The objective of this research was to develop a methodology to compare the costs and benefits and energy implications of different strategies for managing low volume rural road systems. Both public costs such as construction costs, resurfacing costs and routine maintenance costs, and private costs such as variable vehicle operating costs and driver wages or driver opportunity costs as well as energy implications are considered. Management strategies considered included increasing the miles of hard surfaced roads, reducing maintenance on selected roads and/or road and bridge abandonment.

A case study area of approximately 580 square miles was selected in a predominantly agricultural region. Because of the importance of low volume roads to agriculture in the region, special attention was given to the costs of transporting agricultural products and farm inputs on the rural road network. Also considered were personal travel costs and school bus and postal service route costs and overhead traffic.

A link-node baseline network was modeled to represent the existing rural road network of the region and all expected agricultural and personal travel. Other link-node networks with different numbers of miles of hard surface roads, reduced maintenance mileage and/or abandoned roads were modeled to represent alternative scenarios.

These network models were then solved for the minimum travel cost for all the expected traffic to and from local origins and destinations using a version of the TRANPLAN/NEDS software provided by the Urban Analysis Group.

Results show that total annual agricultural and personal travel costs in the 580 square mile study area were $6,704,000, and expected annual maintenance costs were $1,123,000. Paving 27 miles of highly used gravel would reduce farm and local travel costs by $100,000 and overhead travel cost by $75,000 while increasing annualized paving and maintenance costs $187,000. The results of another strategy (abandoning 31 miles of gavel and 135 miles of earth roads increased farm and local travel costs only $14,000 while decreasing annual maintenance costs $47,000 before salvage. The scenario that combined the two strategies showed a travel costs savings of $166,000 and an increase in annualized paving and maintenance costs of $125,000 before salvage. Vehicle energy consumption declined marginally (less than 1% from the baseline in all scenarios).

The application of this type of modeling will enable rural road managers to make rational decisions about expenditures and/or inform the public about the public and private costs and tradeoffs of the rural road network. A user manual and test data are available from the Principal Investigator.

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Special thanks to Alan Davie at the Urban Analysis Group for his help with an earlier draft.

Introduction

The objective of this paper is to provide a starting point for those interested in using transportation modeling software in a rural road setting. An example problem will be offered, and the package that it will be demonstrated in is TRANPLAN Version 6.20 (The Urban Analysis Group, Danville CA). It is assumed that the reader has a basic previous understanding of microcomputer hardware, software and operating systems. With this purpose in mind, this paper will also provide example code from TRANPLAN to illustrate various parts of the analysis process. Essentially this paper is a companion guide to the various sections of the TRANPLAN manual. Because of the applied nature of this task, only cursory discussion will be expended on the development of theory. References to several articles will be made instead.

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The Problem

The local rural road system--that is maintained and controlled by counties or townships--consists of 2.2 million miles and represents 71 percent of the 3.2 million miles of rural roads in

the United States. The system is generally laid out in rectangular grids, particularly in the Midwest where the regularity of the county roads dates back to the Ordinance of 1785 that established the one-mile survey grids to open the land for settlement.

Many of today's local rural roads and bridges were built in the late 1800s and early 1900s when overland transportation was limited to horse and wagon or the recently built railroad lines. The discovery of large petroleum reserves in Texas and Oklahoma spurred the development of the automobile and truck industries during the 1920s and 1930s and created a need to get rural American "out of the mud." Roads were surfaced, and some bridges were replaced to accommodate trucks with gross weights of six to seven tons. About 70 percent of today's rural bridges were built before 1935, but even those constructed in the 1940s were designed only for 15-ton loads.

By 1950 about 50 percent of the local rural roads were improved with all-weather gravel or paved surfaces. Thus the widths, grades, bases, surface designs, and capacities of many local rural roads and bridges are based on the traffic needs of the 1940s and 1950s.

The declining number of farms and the increasing size of farm trucks and implements are changing the traffic on the local rural road system. There are no weight limits on "implements of husbandry" (farm equipment). Today some farmers use a tractor and two wagons to haul 600 to 900 bushels of grain with a gross weight of 28 to 36 tons. Many bridges are over 55 feet long, so that the entire load is on the bridge at one time. Some single-axle wagons

hold over 800 bushels of grain; after deducting about 6,000 pounds of hitch weight, the loaded weight ranges up to 50,000 pounds per axle.

As farm size has increased, so have the trucks serving agriculture. Tandem-axle trucks with gross weights of 27 tons are common on rural roads and bridges. In 1975, the U.S. Congress permitted states to set higher weight limits for trucks on the interstate highway system. Most states adopted the federal limits and raised the weight limits to the federal standard of 20,000 pounds per axle, 34,000 pounds per two-axle tandem, and 80,000-pound maximum overall weight.

The introduction of low-cost unit grain trains in the corn and wheat states has encouraged the use of larger farm vehicles to haul grain longer distances. Some farmers are buying tandem-axle and semi-trailer trucks to move their grain out of the field quickly, to increase their marketing options, to reduce hauling costs, and to eliminate the safety hazards of farm tractor-wagon combinations. These heavy vehicles place additional stress on the local road and bridge system.

In most instances, a farmer increases his farm size by buying or leasing land from neighboring farms, thereby reducing the total number of farms. This reduction in the number of farms means that some rural roads may no longer by needed for access to homes, schools, and markets. Some observers believe that the miles of rural roads might be reduced without denying access to the remaining farms and residences.

And finally, the declining rural population has resulted in a reduction in the number of rural schools. To help minimize the cost of transporting school children farther to fewer schools, school boards are purchasing 72-89-passenger school buses. These school buses weigh up to 15 tons when loaded and cannot cross bridges that are posted at less than their gross weights.

Precise data on the current condition of the local rural road system are not available since no ongoing coordinated data collection exists for local rural roads. However, there is ample evidence that the system is deteriorating rapidly. In a recent Illinois survey, farmers and agribusiness representatives rated about half of the Illinois local rural roads as needing more than regular maintenance; over 20 percent of these roads were rated as needing major repair.

USDA's Office of Transportation reveals that almost half of the rural road and bridge mileage has an earth, gravel, or loose kind of aggregate surface. Over one-third of this rural mileage is classified by township officials as barely adequate or even worse. In this order, county officials estimate that the annual average cost of maintenance of a mile of rural road ranges from $1,890 for loose aggregate or gravel, up to $5,109 for concrete or paved surfaces.

Common complaints about the local rural roads include:

1. Overweight vehicles breaking up road surfaces.
2. Lack of hard surfaces creating dust and rideability problems.

3. Road widths and other design characteristics inadequate for today's large farm equipment and heavy trucks.
4. Narrow lanes creating safety problems.

While the local road deficiencies are significant, the condition of local bridges is also of great concern. Deficient bridges on local rural roads create serious safety and traffic constraints. On 1 January 1986, 167,985 bridges or 55 percent of all off-federal-aid bridges that had been inventoried were deficient. In addition, 121,507 or 40% of the 304,948 on-federal-aid bridges were posted, or should have been posted, at less than legal weight limits. The estimated replacement and rehabilitation costs of these deficient off-system bridges is $20.4 billion. However, even this understates the magnitude of the problem. Bridges under 20 feet long were not included in the inventory, and thousands of such bridges need replacement or rehabilitation.

Because of the above reasons, the financing of the rural road system is becoming a major concern to rural officials. Local rural road and bridge construction and maintenance funds are typically obtained from highway user taxes and local property taxes. Highway user tax collections have increased recently because of large increases in fuel and truck road use taxes. However, the increased fuel efficiency of new model cars tends to reduce income from fuel taxes and there is severe competition for funds from state, federal and municipal jurisdictions for their infrastructure and from competing transportation modes such as rapid transit.

Research Objective Of The Methodology

The objective of this research is to evaluate a number of strategies for the use of limited funds to maintain and/or improve the rural transportation infrastructure. The basic concept is that the rural road infrastructure in one or more small areas will be studied intensively. Scenarios will be developed to consider the effects of different levels of road maintenance, development of optimal networks of paved roads, elimination of maintenance and/or the revision to private ownership of little used roads and different levels of bridge improvements. Decision criteria will be cost based. Possible cost components include:

A. 1. Vehicle operating expense by road or surface type by type of vehicle.
   2. Opportunity cost of travel by trip type/person type.
   3. Road maintenance costs by road category.
   4. Bridge maintenance costs by bridge type.
   5. Road upgrading costs--total or annualized.
   6. Bridge upgrading costs--total or annualized.

B. 1. Opportunity costs of land added or dropped from road system.

A number of possible criteria exist for determining the "best" management scenario. An example would be to minimize the total costs A1-A6. Another example would be to minimize total vehicle operating costs not exceeding a given maintenance budget.

Literature Review

The most extensive study of rural road management was done by Baumel (1) at Iowa State. Baumel used a benefit cost analysis to analyze alternative strategies using three study areas of 100

square miles each. Using Dijkstra's algorithm, Baumel created a network model consisting of nodes (intersection, farm gate, or similar dwelling) connected by arcs (the road in between the node). Data was collected pertaining to quantity, origins and destinations by vehicle type for household and farm travel. Data collection was performed by professional statisticians and interviewers. Baumel considered several alternative strategies and the results of their analyses showed that in each of the study areas, low volume roads could be removed with savings in maintenance costs to the county greater than the increased travel cost incurred by the traveling public. The study also concluded that impact on farm travel cost was greater than that of household travel cost.

Several papers stemming from this study were more specific about certain aspects of the study. In estimating farm vehicle travel cost, Baumel (2) revealed that most of the variance in travel cost is a function of size and type of the equipment as well as the type of the road surface. Zaniewski (18) found that road roughness of paved roads had little influence on travel cost, but that nonpaved roads indeed had adverse effects on travel cost.

Tucker and Thompson (16) examined the impact of rural road management on grain marketing costs and addresses the question of the implications on the agriculture and rural communities from rural road improvement. They developed a linear programming transportation model to deal with the problem of distributing a homogenous product (in this case grain) from many spatially separated sources to a specific destination (in this case, an

elevator). The model provided an optimal commodity flow at a minimum farm to market cost. After examining several scenarios, Tucker and Thompson showed that road deterioration places an added cost to grain producers and that producer costs decrease as road development increases. However, the decrease in grain transportation alone cannot justify an increase public investment of road maintenance. Specifically, road deterioration led to cost increase which was 39 times less than the corresponding investment to achieve this benefit. That is, public investment to repair a deteriorated road and decrease producer cost would cost 39 times greater than the benefit received by the producer. Furthermore, changes in the condition of the rural road system have little effect on optimal grain marketing traffic flow, the impact has a greater effect on producers than elevators, and the benefits to the grain industry are relatively small compared to the investment involved.

Hitzhusen and Nyamaah (10) developed a circuity cost model for measuring costs and benefits of rural bridge rehabilitation, closure or posting and estimating and comparing the costs and benefits using a case study. They found a substantial increase in savings to motorist could be made by adopting the circuity cost model compared to that of the county procedure (in this case, Wayne county, Ohio). Also found was that there were substantial costs incurred by the traveling public when bridges were posted.

Chicoine and Walzer (3) did the first major study which examined the physical and financial condition of rural road

infrastructure in four midwestern states (Illinois, Minnesota, Ohio, Wisconsin). Information was collected through mail surveys to farmers, township representatives, and agribusiness. Information was studied to examine the need for updating of managerial practices, maintaining and upgrading roads and the financial resources available for maintaining and upgrading. There was an effort made to incorporate views of the farmers, road users and the government officials responsible for the roads. Several recommendations were made to aid local officials in better managing their road network and finances.

Chicoine and Walzer also edited a book (4) which offered numerous chapters from different authorities providing a broad background in the physical and financial resource condition of the rural infrastructure.

Smith, Wilkinson, and Anschel (1973) examined the impact of unimproved roads in the eastern Kentucky coal fields on resident participation in social recreation, education, and medical activities. They found that lack of access to all-weather roads had no measurable adverse effect on human resource development and cultural integration.

The Midwest Research Institute (1969) developed criteria for evaluating low volume rural roads for potential abandonment. These criteria were to be used to calculate a benefit-cost ratio for each road, and type of users, type of road, and access requirements. Each factor was assigned an arbitrary weight and aggregated into an index. The costs of retaining a road included the 20-year routine

maintenance and capital costs, liability risks, and vacating costs. The benefit index does not include any monetary measures of the value of an individual road to the traveling public. This procedure does not measure the change in cost to the traveling public from eliminating a road or set of roads from the network, nor does it measure the maintenance and resurfacing cost transferred to roads that inherit additional traffic.

Johnson (1977) developed models that could be used to estimate the benefits of road improvements, including building a new road, replacing and upgrading bridges, and widening or resurfacing a road. The analysis was conceptual rather than empirical, and no measured benefits were presented.

TRANPLAN Example

The accompanying computer disk contains all of the example files that follow and the necessary sundry support files. Both a "batch" version of the files and "cell" version is provided. A file editor will be required to make changes to the files. BRIEF v2.01 by UnderWare, Inc. was the editor used to create the files. Refer to the README.DOC file on the disk for additional information. It is worthwhile to read or review the "General Description" section of the TRANPLAN manual before continuing. This example is not a substitute for formal training in TRANPLAN. The main purpose is to provide a working overview that you can run and modify on your computer with reduced setup time.

Equipment Used In The Example:

Zenith Computer with: Intel 80386 @ 16MHz
Intel 80387 Math-CoProcessor
VGA Video Adapter
Microsoft Serial Mouse Ver. 6.17
Two 71M Hard Disks
1.2M, 1.44M Floppy Disks
Memory
640K DOS (588K Availible)
3,071K Extended
3,408K Expanded
Operating System: DOS 3.30

Hewlett Packard 7475A pen plotter

Hewlett Parkard LaserJet IIP printer

It is assumed for this example the user has TRANPLAN and NEDS installed correctly along with a file editor and approximately 3M of hard disk storage is available.

The Small Fanciful Network

The example study area is eight miles by seven miles. Major features of this simulated rural area include:

1. A large town that is a retail service center (with a large grain elevator, a sugar beet processing plant, and a potatoes warehouse).

2. A sugar beet staging facility (beet dump).

3. A medium town with a sugar beet plant.

4. A medium town with a small grain elevator.

5. A large grain elevator with a small town.

The major agricultural commodities produce in the area are grain (wheat, barley), potatoes and sugar beets. The road network connecting these five features (and 20 additional points that are farmsteads and field access points) are of three type: gravel, low quality "blacktop" and high quality "blacktop". The jurisdiction

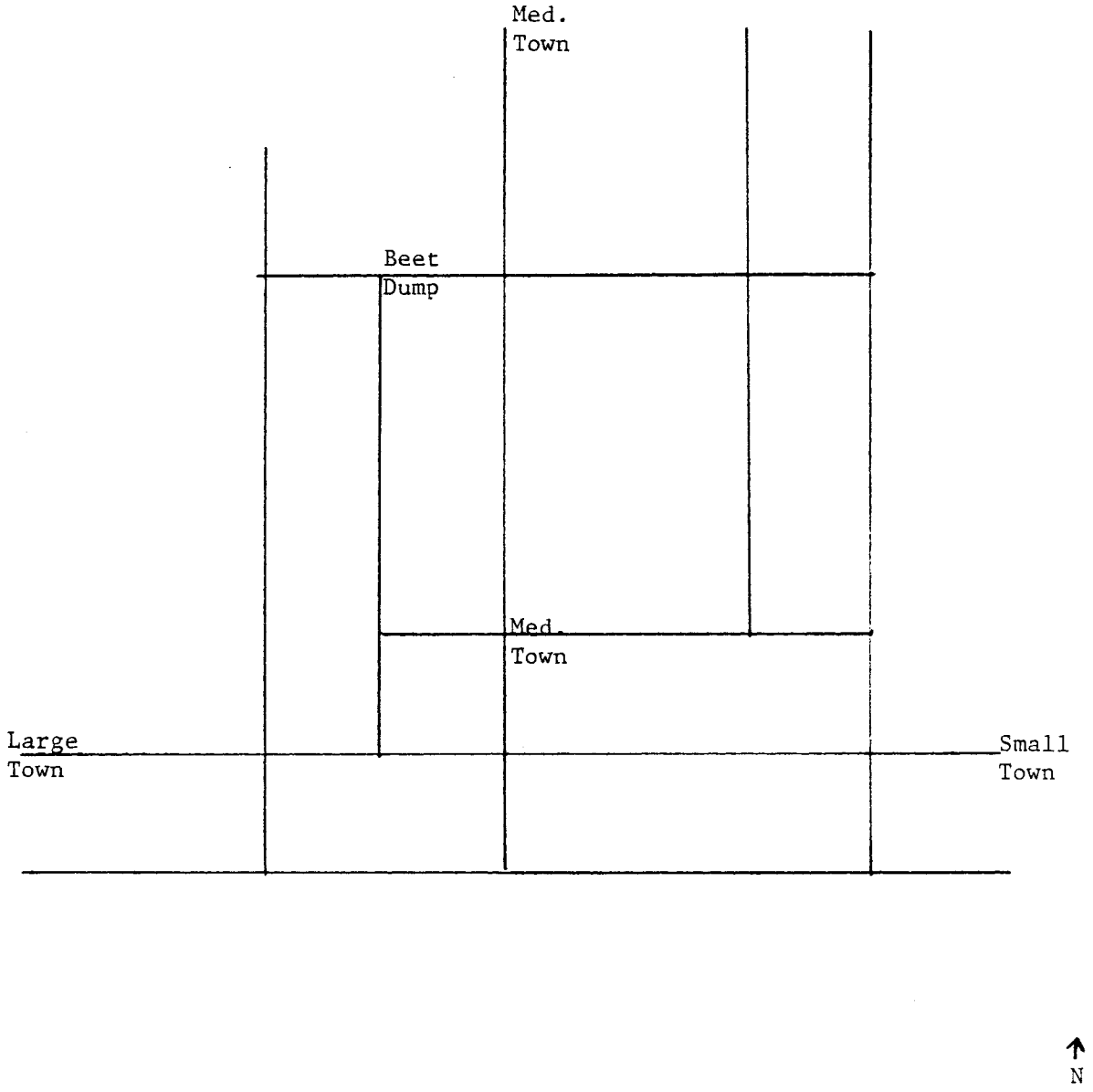
of the roads falls to the state, county, or the township. There are four vehicle types the will be used - car, pickup, farm truck, and semi. Trip purposes are categorized under one of the following:

1. personal (church, household shopping, etc.)
2. farm business (pricing, farms supply, ASCS)
3. farm marketing - grain
4. farm marketing - sugar beets and potatoes

The vehicles used for these trips are cars, pickups, farm trucks, and "heavy" trucks.

Figure 1 is map of the study area.

Figure 1



The "X" and "Y" are values that in conjunction with each other gives the "position" of the node in the network. The "X" value fall on the horizontal axis and the "Y" on the vertical axis. The point (0,0) would fall in the lower left corner of the map. Each 100 units value is equal to one mile. Refer to the NETWORKS section pages 1-1 to 1-18 in the TRANPLAN manual for instruction on file formats.

MAPLEG.DOC

CENT	NODE	X	Y	Description	MAP DOCUMENTATION
0001	1020	100	200		
0002	1030	100	300	(Lg Town, Lg Elevator, SB Plant)	
0003	3020	300	200		
0004	3030	300	300		
0005	3070	300	700		
0006	3080	300	800		
0007	4030	400	300		
0008	4040	400	400		
0009	4070	400	700	(SB dump)	
0010	5020	500	200		
0011	5030	500	300		
0012	5040	500	400	(Md Town, SB Plant)	
0013	5070	500	700		
0014	5090	500	900	(Md Town, Sm Elevator)	
0015	7040	700	400		
0016	7060	700	600		
0017	7070	700	700		
0018	7090	700	900		
0019	8020	800	200		
0020	8030	800	300		
0021	8040	800	400		
0022	8070	800	700		
0023	8090	800	900		
0024	9020	900	200		
0025	9030	900	300	(Sm Town, Lg Elevator)	

DIRECTION CODES

NORTH/SOUTH (A-B-A) = 1,3
EAST/WEST (A-B-A) = 2,4
CENTRIOD (A-B-A) = 5,11

ASSIGNMENT GROUPS: 0 = CENTROID
1 = NODES

LINK GROUP 1: 0 = 0 MPH CENTROID (ROAD TYPE)
1 = 40 MPH GRAVEL
2 = 55 MPH BIT
3 = 60 MPH BIT

LINK GROUP 2: 0 = CENTROID (JURISDICTION)
1 = TOWNSHIP
2 = COUNTY
3 = STATE
4 = FEDERAL

A NODE	B NODE	AG	DIST MILES	MPH	DIR CODE	LINK 1 GROUP	LINK 2 GROUP	NOTES
0001	1020	0	.0	0	5	0	0	CENT
0002	1030	0	.0	0	5	0	0	L Town, L Elevator, SB Plant
0003	3020	0	.0	0	5	0	0	CENT
0004	3030	0	.0	0	5	0	0	CENT
0005	3070	0	.0	0	5	0	0	CENT
0006	3080	0	.0	0	5	0	0	CENT
0007	4030	0	.0	0	5	0	0	CENT
0008	4040	0	.0	0	5	0	0	CENT
0009	4070	0	.0	0	5	0	0	SB Dump
0010	5020	0	.0	0	5	0	0	CENT
0011	5030	0	.0	0	5	0	0	CENT
0012	5040	0	.0	0	5	0	0	M Town, SB Plant
0013	5070	0	.0	0	5	0	0	CENT
0014	5090	0	.0	0	5	0	0	M Town, S Elevator
0015	7040	0	.0	0	5	0	0	CENT
0016	7060	0	.0	0	5	0	0	CENT

0017	7070	0	.0	0	5	0	0	CENT
0018	7090	0	.0	0	5	0	0	CENT
0019	8020	0	.0	0	5	0	0	CENT
0020	8030	0	.0	0	5	0	0	CENT
0021	8040	0	.0	0	5	0	0	CENT
0022	8070	0	.0	0	5	0	0	CENT
0023	8090	0	.0	0	5	0	0	CENT
0024	9020	0	.0	0	5	0	0	CENT
0025	9030	0	.0	0	5	0	0	S Town, L Elevator
1020	3020	1	2.0	40	2	1	2	
1030	3030	1	2.0	60	2	3	2	
3020	3030	1	1.0	40	3	1	1	
3020	5020	1	2.0	40	2	1	2	
3030	3070	1	4.0	40	3	1	2	
3030	4030	1	1.0	60	2	3	2	
3070	3080	1	1.0	40	3	1	1	
3070	4070	1	1.0	40	2	1	1	
4030	4040	1	1.0	40	3	1	2	
4030	5030	1	1.0	60	2	3	2	
4040	5040	1	1.0	40	2	1	1	
4040	4070	1	3.0	40	3	1	2	
4070	5070	1	1.0	55	2	2	2	
5020	5030	1	1.0	60	3	3	3	
5020	8020	1	3.0	60	2	3	3	
5030	5040	1	1.0	60	3	3	3	
5030	8030	1	3.0	40	2	1	2	
5040	5070	1	3.0	60	3	3	3	
5040	5940	1	.9	55	2	2	2	
5940	6140	1	.2	55	2	2	2	BRIDGE
6140	7040	1	.9	55	2	2	2	
5070	5090	1	2.0	60	3	3	3	
5070	7070	1	2.0	40	2	1	2	
7040	7060	1	2.0	40	3	1	2	
[illegible]40	8040	1	1.0	55	2	2	2	
7060	7070	1	1.0	40	3	1	2	
7070	7090	1	2.0	40	3	1	2	
7070	8070	1	1.0	40	2	1	2	
8020	8030	1	1.0	40	3	1	1	
8020	9020	1	1.0	60	2	3	3	
8030	8040	1	1.0	40	3	1	1	
8030	9030	1	1.0	40	2	1	2	
8040	8070	1	3.0	55	3	2	2	
8070	8090	1	2.0	55	3	2	2	

README.DOC (FROM DISK)

This disk contains these files in these directories: Batch , Cellfile and Misc.

The files in \batch will create all the output of the example problem. The batfile "out.bat" will rename the TRNPLNXX.OUT files to match the "cellfile".

The files in \cellfile are the individual parts of the batch file.

Copy these files to your hard disk with at least 3M available. Files with the extension "in" are TRANPLAN command files that when renamed "trnpln.in" can be executed .

```
 FILE NAME                DESCRIPTION
- MAPLED.DOC    ( MAP DOCUMENTATION FOR SMNET91.DOC )
- BATCH.IN      ( BATCH FILE OF TRANPLAN INSTRUCTION SET )
- OUT.BAT       ( FILE TO RENAME TRNPLNXX/OUT TO MATCH CELL NAMES )

- SMNET91.DOC     ( Raw network data file )

- BHN.IN            ( BUILD HIGHWAY NETWORK )
  - SMNET91.DAT     ( NETWORK FILE - TRANPLAN STRUCTURE )
  ~ BHN#.OUT        ( TP RECORD OF BHN RUN )
  - BHN01.OUT       ( TP RECORD OF SMNET91.DOC BHN )

~ HNEDS         ( HIGHWAY NETWORK EDITING SYSTEM )
  - SMNET91X.DAT    ( MODIFIED TP FILE W/LINK OUT FOR HEAVY TRUCKS )

- RHN#.IN        ( REPORT HIGHWAY NETWORK, 1= FULL NETWORK 2= W/O BRIDGE )
  - RHN#.OUT      ( TP RECORD OF RHN RUN W/NETWORK DESCRIPTION REPORT )
  - RHN01.OUT     (     TP RECORD OF RHN RUN ON FULL NETWORK )
  - RHN02.OUT     ( TP RECORD OF RHN RUN ON NETWORK W/O BRIDGE LINK )

- RHP#.IN        ( REPORT HIGHWAY PATHS, 1= FULL NETWORK 2= W/O BRIDGE )
  ~ RHP#.OUT      ( TP RECORD OF RHP RUN W/NETWORK IMPEDANCE REPORT )
  - RHP01.OUT     (     TP RECORD OF RHP RUN ON FULL NETWORK )
  - RHP02.OUT     ( TP RECORD OF RHP RUN ON NETWORK W/O BRIDGE LINK )

 - PHN#.IN       ( PLOT HIGHWAY NETWORK, # = W/VARIOUS PLOT OPTIONS)
  - PNET#.PLT     ( FILE FOR OUTPUT ON THE PLOTTER )
  - PHN#.OUT      ( TP RECORD OF PHN# RUN )
  - PLOT.BAT      ( FILE TO "COPY" PLOTTER FILE TO COM1 )

- BCUNXXX.IN    ( BUILD COST USER NETWORK )
  - BCUNCAR.IN    ( CAR COST AND NETWORK )
  - BCUNPU.IN     ( PICKUP COST AND NETWORK )
  - BCUNFMG.IN    ( FARM TRUCK COST AND NETWORK )
  - BCUNFMB.IN    ( HEAVY TRUCK COST AND NETWORK - NO BRIDGE )
  - BCUNXXX.OUT   ( TP RECORD OF RUN )

  - SN91CAR.CST   ( TP NETWORK W/CAR COST )
  - SN91FB.CST    ( TP NETWORK W/PICKUP COST )
  - SN91FMG.CST   ( TP NETWORK W/FARM TRUCK COST )
  - SN91FMB.CST   ( TP NETWORK W/HEAVY TRUCK COST - NO BRIDGE IN NETWORK )

- HSSXXX.IN     ( HIGHWAY SELECTED SUMMATION - TO OBTAIN SKIM FILES )
  - HSSCAR.IN
  - HSSFB.IN
  - HSSFMG.IN
  - HSSFMB.IN
  - HSSXXX.OUT

  - SN91CAR.SKM   ( TP FORMAT SKIM TABLES )
  - SN91FB.SKM
  - SN91FMG.SKM
  - SN91FMB.SKM
```

```
  - RMXXX.IN    ( REPORT MATRIX )
  - RMCAR.IN      ( SKIM TABLES FOR CARS )
  - RMFB.IN       (     SKIM TABLES FOR PICKUPS )
  - RMFMG.IN      ( SKIM TABLES FOR FARM TRUCKS )
  - RMFMB.IN      ( SKIM TABLES FOR HEAVY TRUCKS )
  - RMXXX.OUT

- RHNXXX.IN       (REPORT HWY NETWORK)
  - RHNCAR.IN
  - RHNPU.IN
  - RHNFMG.IN
  - RHNFMB.IN
  - RHNXXX.OUT

- SRVDATA       ( SURVEY DATA FILES OF TRIPS )
  - SRVDATA.PER  ( PERSONAL (PER) TRIPS - CARS )
  - SRVDATA.FB   ( FARM BUSINESS (FB) TRIPS - PICKUP TRUCKS )
  - SRVDATA.FMG  ( FARM MARKETING (FMG) TRIPS - FARM TRUCKS FOR GRAINS)
  - SRVDATA.FMB  ( FARM MARKETING (FMB) TRIPS - HEAVY TRUCKS FOR BEETS )

- BTT#.IN       ( BUILD TRIP TABLE 1=PER 2=FB 3=FMG 4=FMB )
  - PER.VOL      (                          )
  - FB.VOL       (   TP FORMAT OF TRIP FILE   )
  - FMG.VOL      (                          )
  - FMB.VOL      (                        )
  - BTT#.OUT     ( TP RECORD OF BTT# RUN W/TRIP SUMMARY TABLE )

 - LHN#.IN         ( LOAD HIGHWAY NETWORK W/VARIOUS VOL AND SMNET91.DAT )
  - LODHIST.PER
  - LODHIST.FB
  - LODHIST.FMG
  - LODHIST.FMB  ( SMNET91X.DAT USED - NO BRIDGE LINK )
  - LHN#.OUT     ( TP OF LHN# RUN 1=PER 2=FB 3=FMG 4=FMB )

- RHNS#.IN      ( REPORT HIGHWAY NETWORK SUMMARY 1=PER 2=FB 3=FMG 4=FMB )
  - RHNS#.OUT    ( TP RECORD OF RHNS# RUN W/ VARIOUS SUMMARY TABLES )

- RHL#.IN       ( REPORT HIGHWAY LOAD REPORT 1=PER 2=FB 3=FMG 4=FMB )
  - RHL#.OUT     ( TP RECORD OF RHL# RUN )

- MHNU.IN       ( MACRO HIGHWAY NETWORK UPDATE )
  - MHNU.OUT     ( TP RECORD OF MHNU RUN )

- post processing  ( ON YOUR OWN )
```

The first major task is to produce a file of information that both describes the make up of the study area and is in a form that TRANPLAN can interpret. The Build Highway Network function then transforms this information into a TRANPLAN HWYNET file that contain the network description. The file smnet91.doc is the input file for our study area. You would not have to create an enteral input file but could use the $DATA section of the Build Highway Network function. (see TRANPLAN manual NETWORKS section pages 1-1 to 1-18)

SMNET91.DOC

```
N 0001    100  200
N 0002    100  300
N 0003    300  200
N 0004    300  300
N 0005    300  700
N 0006    300  800
N 0007    400  300
N 0008    400  400
N 0009    400  700
N 0010    500  200
N 0011    500  300
N 0012    500  400
N 0013    500  700
N 0014    500  900
N 0015    700  400
N 0016    700  600
N 0017    700  700
N 0018    700  900
N 0019    800  200
N 0020    800  300
N 0021    800  400
N 0022    800  700
N 0023    800  900
N 0024    900  200
N 0025    900  300
N 1020    100  200
N 1030    100  300
N 3020    300  200
N 3030    300  300
N 3070    300  700
N 5080    300  800
N 4030    400  300
N 4040    400  400
N 4070    400  700
N 5020    500  200
N 5030    500  300
N 5040    500  400
N 5070    500  700
N 5090    500  900
N 5940    590  400
N 6140    610  400
N 7040    700  400
N 7060    700  600
N 7070    700  700
N 7090    700  900
N 8020    800  200
N 8030    800  300
N 8040    800  400
N 8070    800  700
N 8090    800  900
N 9020    900  200
N 9030    900  300
 0001 10200   0s   0    5 0 0 0          2                    CENT
 0002 10300   0s   0    5 0 0 0          2                         CENT
 0003 30200   0s   0    5 0 0 0          2                         CENT
 0004 30300   0s   0    5 0 0 0          2                         CENT
 0005 30700   0s   0    5 0 0 0          2                         CENT
 0006 30800   0s   0    5 0 0 0          2                         CENT
 0007 40300   0s   0    5 0 0 0          2                         CENT
 0008 40400   0s   0    5 0 0 0          2                         CENT
 0009 40700   0s   0    5 0 0 0          2                         CENT
 0010 50200   0s   0    5 0 0 0          2                         CENT
 0011 50300   0s   0    5 0 0 0          2                         CENT
 0012 50400   0s   0    5 0 0 0          2                         CENT
 0013 50700   0s   0    5 0 0 0          2                         CENT
 0014 50900   0s   0    5 0 0 0          2                         CENT
 0015 70400   0s   0    5 0 0 0          2                         CENT
```

0016	70600	0s	0	5	0	0	0	2		CENT
0017	70700	0s	0	5	0	0	0	2		CENT
0018	70900	0s	0	5	0	0	0	2		CENT
0019	80200	0s	0	5	0	0	0	2		CENT
0020	80300	0s	0	5	0	0	0	2		CENT
0021	80400	0s	0	5	0	0	0	2		CENT
0022	80700	0s	0	5	0	0	0	2		CENT
0023	80900	0s	0	5	0	0	0	2		CENT
0024	90200	0s	0	5	0	0	0	2		CENT
0025	90300	0s	0	5	0	0	0	2		CENT
1020	30201	200s4000		2	1	2	0	2		
1030	30301	200s6000		2	3	2	0	2		
3020	30301	100s4000		3	1	1	0	2		
3020	50201	200s4000		2	1	2	0	2		
3030	30701	400s4000		3	1	2	0	2		
3030	40301	100s6000		2	3	2	0	2		
3070	30801	100s4000		3	1	1	0	2		
3070	40701	100s4000		2	1	1	0	2		
4030	40401	100s4000		3	1	2	0	2		
4030	50301	100s6000		2	3	2	0	2		
4040	50401	100s4000		2	1	1	0	2		
4040	40701	300s4000		3	1	2	0	2		
4070	50701	100s5500		2	2	2	0	2		
5020	50301	100s6000		3	3	3	0	2		
5020	80201	330s6000		2	3	3	0	2		
5030	50401	100s6000		3	3	3	0	2		
5030	80301	300s4000		2	1	2	0	2		
5040	50701	300s6000		3	3	3	0	2		
5040	59401	90s5500		2	2	2	0	2		
5940	61401	20s5500		2	2	2	0	2		BRIDGE
6140	70401	90s5500		2	2	2	0	2		
5070	50901	200s6000		3	3	3	0	2		
[illegible]070	70701	200s4000		2	1	2	0	2		
[illegible]40	70601	200s4000		3	1	2	0	2		
7040	80401	100s5500		2	2	2	0	2		
7060	70701	100s4000		3	1	2	0	2		
7070	70901	200s4000		3	1	2	0	2		
7070	80701	100s4000		2	1	2	0	2		
8020	80301	100s4000		3	1	1	0	2		
8020	90201	100s6000		2	3	3	0	2		
8030	80401	100s4000		3	1	1	0	2		
8030	90301	100s4000		2	1	2	0	2		
8040	80701	300s5500		3	2	2	0	2		
8070	80901	200s5500		3	2	2	0	2		

START OF TRANPLAN FUNCTION CODE

```
$BUILD HIGHWAY NETWORK
$FILE
     INPUT FILE = NETDATA, USER ID = $SMNET91.DOC$
     OUTPUT FILE = HWYNET, USER ID = $SMNET91.DAT$
$HEADERS
                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                *********************************************
                         copyrighted BY pfi, 1990
$OPTIONS
     NETDATA
     PRINT DATA
$PARAMETERS
     NUMBER OF ZONES = 25
     MAXIMUM NODE = 9030
     ERROR LIMIT = 10
$END TP FUNCTION
```

```
DCCO / UAG                          A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.    1
TRANPLAN SYSTEM                     ********************************************                     DATE   30JUN91
VERSION 6.20                                   COPYRIGHTED BY PFI, 1990                              TIME  22:07:46

HIGHWAY NETWORK DATA TRANSACTIONS --

        N 0001    100  200
        N 0002    100  300
        N 0003    300  200
        N 0004    300  300
        N 0005    300  700
        N 0006    300  800
        N 0007    400  300
        N 0008    400  400
        N 0009    400  700
        N 0010    500  200
        N 0011    500  300
        N 0012    500  400
        N 0013    500  700
        N 0014    500  900
        N 0015    700  400
        N 0016    700  600
        N 0017    700  700
        N 0018    700  900
        N 0019    800  200
        N 0020    800  300
        N 0021    800  400
        N 0022    800  700
        N 0023    800  900
        N 0024    900  200
        N 0025    900  300
        N 1020    100  200
        N 1030    100  300
        N 3020    300  200
        N 3030    300  300
        N 3070    300  700
        N 3080    300  800
        N 4030    400  300
        N 4040    400  400
        N 4070    400  700
        N 5020    500  200
        N 5030    500  300
        N 5040    500  400
        N 5070    500  700
        N 5090    500  900
        N 5940    590  400
        N 6140    610  400
        N 7040    700  400
        N 7060    700  600
        N 7070    700  700
        N 7090    700  900
        N 8020    800  200
        N 8030    800  300
        N 8040    800  400
        N 8070    800  700
        N 8090    800  900
        N 9020    900  200
        N 9030    900  300
         0001 10200   0s   0    5 0 0 0          2                          CENT
         0002 10300   0s   0    5 0 0 0          2                           CENT
         0003 30200   0s   0    5 0 0 0          2                           CENT
         0004 30300   0s   0    5 0 0 0          2                           CENT
         0005 30700   0s   0    5 0 0 0          2                           CENT
         0006 30800   0s   0    5 0 0 0          2                           CENT
         0007 40300   0s   0    5 0 0 0          2                           CENT
         0008 40400   0s   0    5 0 0 0          2                           CENT
         0009 40700   0s   0    5 0 0 0          2                           CENT
         0010 50200   0s   0    5 0 0 0          2                           CENT
```

0011	50300	0s	0	5	0	0	0		2	CENT
0012	50400	0s	0	5	0	0	0		2	CENT
0013	50700	0s	0	5	0	0	0		2	CENT
0014	50900	0s	0	5	0	0	0		2	CENT
0015	70400	0s	0	5	0	0	0		2	CENT
0016	70600	0s	0	5	0	0	0		2	CENT
0017	70700	0s	0	5	0	0	0		2	CENT
0018	70900	0s	0	5	0	0	0		2	CENT
0019	80200	0s	0	5	0	0	0		2	CENT
0020	80300	0s	0	5	0	0	0		2	CENT
0021	80400	0s	0	5	0	0	0		2	CENT
0022	80700	0s	0	5	0	0	0		2	CENT
0023	80900	0s	0	5	0	0	0		2	CENT
0024	90200	0s	0	5	0	0	0		2	CENT
0025	90300	0s	0	5	0	0	0		2	CENT
1020	30201	200s	4000	2	1	2	0		2	
1030	30301	200s	6000	2	3	2	0		2	
3020	30301	100s	4000	3	1	1	0		2	
3020	50201	200s	4000	2	1	2	0		2	
3030	30701	400s	4000	3	1	2	0		2	
3030	40301	100s	6000	2	3	2	0		2	
3070	30801	100s	4000	3	1	1	0		2	
3070	40701	100s	4000	2	1	1	0		2	
4030	40401	100s	4000	3	1	2	0		2	
4030	50301	100s	6000	2	3	2	0		2	
4040	50401	100s	4000	2	1	1	0		2	
4040	40701	300s	4000	3	1	2	0		2	
4070	50701	100s	5500	2	2	2	0		2	
5020	50301	100s	6000	3	3	3	0		2	
5020	80201	330s	6000	2	3	3	0		2	
5030	50401	100s	6000	3	3	3	0		2	
5030	80301	300s	4000	2	1	2	0		2	
5040	50701	300s	6000	3	3	3	0		2	
5040	59401	90s	5500	2	2	2	0		2	
5940	61401	20s	5500	2	2	2	0		2	BRIDGE
6140	70401	90s	5500	2	2	2	0		2	
5070	50901	200s	6000	3	3	3	0		2	
5070	70701	200s	4000	2	1	2	0		2	
7040	70601	200s	4000	3	1	2	0		2	
7040	80401	100s	5500	2	2	2	0		2	
7060	70701	100s	4000	3	1	2	0		2	
7070	70901	200s	4000	3	1	2	0		2	
7070	80701	100s	4000	2	1	2	0		2	
8020	80301	100s	4000	3	1	1	0		2	
8020	90201	100s	6000	2	3	3	0		2	
8030	80401	100s	4000	3	1	1	0		2	
8030	90301	100s	4000	2	1	2	0		2	
8040	80701	300s	5500	3	2	2	0		2	
8070	80901	200s	5500	3	2	2	0		2	

BUILD HIGHWAY NETWORK SUMMARY

MAXIMUM ZONE ---------- =	25	MAXIMUM TURN PENALTY CODE --- =	5
MAXIMUM NODE (USER SPECIFIED) --- =	9030	MAXIMUM LINK GROUP 1 CODE --- =	3
MAXIMUM NODE (BY NETWORK BUILDER) =	9030	MAXIMUM LINK GROUP 2 CODE --- =	3
NUMBER OF LINKS (ONE-WAY) ------- =	118	MAXIMUM LINK GROUP 3 CODE --- =	0
MAXIMUM CAPACITY ---------- =	0	MAXIMUM ASSIGNMENT GROUP CODE =	1
MAXIMUM VOLUME (CAPACITY2) ------ =	0		
NUMBER OF TURN PROHIBITOR ------ =	0		
NUMBER OF NODES WITH COORDINATES =	52		

HNEDS

The TRANPLAN format file SMNET91.DAT now lets you explore the powerful environment of NEDS (Network Editing and Display System). In the example there is a bridge that can not be used by "heavy" trucks. We need to create a new network with that link removed to use with heavy trucks. SMNET91.DAT will be the input file after starting HNEDS. The graphical nature of this system will require you to "test drive" it to become comfortable with it. Icons control the execution of the program. The two menus of greatest interest for you will be the "View Menu" and the "Link Update Menu". A file that has the bridge removed (with HNEDS) is provided "SMNET91X.DAT". You time spent with HNEDS is good investment as you continue.

```
$REPORT HIGHWAY NETWORK
$FILE
   INPUT FILE = HWYNET, USER ID = $SMNET91.DAT$
$HEADERS
                 REPORT OF OUR SMALL HIGHWAY NETWORK
                 ***********************************
                      copyrighted BY pfi, 1990
$OPTION
   PRINT COORDINATES
   DETAIL
$PARAMETERS
   IMPEDANCE = TIME 1
$END TP FUNCTIONS
```

The Report Highway Network provides link description and node coordinate reports on the network. This report works with hwy network files and "loaded" hwy network files.

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.10                           COPYRIGHTED BY PFI, 1990                                 TIME  22:07:54


INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
                                                   COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- HWYNET

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:07:54

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX             XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX            XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX  XX           XXXXXXXXXX  XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX  XX           XX      XX  XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX  XX           XX      XX  XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX  XX           XX      XX  XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX   XX           XXXXXXXXXX  XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX          XX           XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX          XX           XX      XX  XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX          XXXXXXXXXX   XX      XX  XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX          XXXXXXXXXX   XX      XX  XX      XX
```

```
*******************************************************************************
*                                                                             *
*                            HIGHWAY NETWORK REPORTS                          *
*                                                                             *
*                  REPORT OF OUR SMALL HIGHWAY NETWORK                        *
*                  ***********************************                        *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER ---------- A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
****
COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ---------- HWYNET

GENERATION FILE NAME ----- HWYNET

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:07:46 CURRENT TIME ---------- 22:07:54

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

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TRANPLAN SYSTEM
VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK
****
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NODE COORDINATES

NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD
1	100	200	2	100	300	3	300	200	4	300	300	5	300	700
6	300	800	7	400	300	8	400	400	9	400	700	10	500	200
11	500	300	12	500	400	13	500	700	14	500	900	15	700	400
16	700	600	17	700	700	18	700	900	19	800	200	20	800	300
21	800	400	22	800	700	23	800	900	24	900	200	25	900	300
1020	100	200	1030	100	300	3020	300	200	3030	300	300	3070	300	700
3080	300	800	4030	400	300	4040	400	400	4070	400	700	5020	500	200
5030	500	300	5040	500	400	5070	500	700	5090	500	900	5940	590	400
6140	610	400	7040	700	400	7060	700	600	7070	700	700	7090	700	900
8020	800	200	8030	800	300	8040	800	400	8070	800	700	8090	800	900
9020	900	200	9030	900	300									

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK
****
COPYRIGHTED BY PFI, 1990

PAGE NO. 1
DATE 30JUN91
TIME 22:07:54

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME
1	1020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
2	1030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
3	3020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
4	3030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
5	3070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
6	3080		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
7	4030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
8	4040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
9	4070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
10	5020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
11	5030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
12	5040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
13	5070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
14	5090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
15	7040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
16	7060		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
17	7070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
18	7090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
19	8020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
20	8030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
21	8040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
22	8070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
23	8090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
24	9020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
25	9030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0

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TRANPLAN SYSTEM
VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK
****
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PAGE NO. 2
DATE 30JUN91
TIME 22:07:54

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
1020	1		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	.00	.00	1	2		2	1		0	0	
1030	2		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		2.00	2.00	60.00	.00	.00	.00	.00	3	2		2	1		0	0	
3020	3		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	1020		2.00	3.00	40.00	.00	.00	.00	.00	1	2		4	1		0	0	
	3030		1.00	1.50	40.00	.00	.00	.00	.00	1	1		3	1		0	0	
	5020		2.00	3.00	40.00	.00	.00	.00	.00	1	2		2	1		0	0	
3030	4		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	1030		2.00	2.00	60.00	.00	.00	.00	.00	3	2		4	1		0	0	TRNVOL
	3020		1.00	1.50	40.00	.00	.00	.00	.00	1	1		1	1		0	0	TRNVOL
	3070		4.00	6.00	40.00	.00	.00	.00	.00	1	2		3	1		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.00	.00	3	2		2	1		0	0	TRNVOL
3070	5		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		4.00	6.00	40.00	.00	.00	.00	.00	1	2		1	1		0	0	
	3080		1.00	1.50	40.00	.00	.00	.00	.00	1	1		3	1		0	0	
	4070		1.00	1.50	40.00	.00	.00	.00	.00	1	1		2	1		0	0	
3080	6		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.00	.00	1	1		1	1		0	0	
4030	7		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		1.00	1.00	60.00	.00	.00	.00	.00	3	2		4	1		0	0	
	4040		1.00	1.50	40.00	.00	.00	.00	.00	1	2		3	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.00	.00	3	2		2	1		0	0	
4040	8		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	4030		1.00	1.50	40.00	.00	.00	.00	.00	1	2		1	1		0	0	
	4070		3.00	4.50	40.00	.00	.00	.00	.00	1	2		3	1		0	0	
	5040		1.00	1.50	40.00	.00	.00	.00	.00	1	1		2	1		0	0	
4070	9		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.00	.00	1	1		4	1		0	0	
	4040		3.00	4.50	40.00	.00	.00	.00	.00	1	2		1	1		0	0	
	5070		1.00	1.09	55.05	.00	.00	.00	.00	2	2		2	1		0	0	
5020	10		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	.00	.00	1	2		4	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.00	.00	3	3		3	1		0	0	
	8020		3.30	3.30	60.00	.00	.00	.00	.00	3	3		2	1		0	0	

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VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK
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PAGE NO. 3
DATE 30JUN91
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NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
5030	11		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.00	.00	3	2		4	1		0	0	TRNVOL
	5020		1.00	1.00	60.00	.00	.00	.00	.00	3	3		1	1		0	0	TRNVOL
	5040		1.00	1.00	60.00	.00	.00	.00	.00	3	3		3	1		0	0	TRNVOL
	8030		3.00	4.50	40.00	.00	.00	.00	.00	1	2		2	1		0	0	TRNVOL
5040	12		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4040		1.00	1.50	40.00	.00	.00	.00	.00	1	1		4	1		0	0	TRNVOL
	5030		1.00	1.00	60.00	.00	.00	.00	.00	3	3		1	1		0	0	TRNVOL
	5070		3.00	3.00	60.00	.00	.00	.00	.00	3	3		3	1		0	0	TRNVOL
	5940		.90	.98	55.10	.00	.00	.00	.00	2	2		2	1		0	0	TRNVOL
5070	13		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4070		1.00	1.09	55.05	.00	.00	.00	.00	2	2		4	1		0	0	TRNVOL
	5040		3.00	3.00	60.00	.00	.00	.00	.00	3	3		1	1		0	0	TRNVOL
	5090		2.00	2.00	60.00	.00	.00	.00	.00	3	3		3	1		0	0	TRNVOL
	7070		2.00	3.00	40.00	.00	.00	.00	.00	1	2		2	1		0	0	TRNVOL
5090	14		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5070		2.00	2.00	60.00	.00	.00	.00	.00	3	3		1	1		0	0	
5940	5040		.90	.98	55.10	.00	.00	.00	.00	2	2		4	1		0	0	
	6140		.20	.22	54.55	.00	.00	.00	.00	2	2		2	1		0	0	
6140	5940		.20	.22	54.55	.00	.00	.00	.00	2	2		4	1		0	0	
	7040		.90	.98	55.10	.00	.00	.00	.00	2	2		2	1		0	0	
7040	15		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	6140		.90	.98	55.10	.00	.00	.00	.00	2	2		4	1		0	0	
	7060		2.00	3.00	40.00	.00	.00	.00	.00	1	2		3	1		0	0	
	8040		1.00	1.09	55.05	.00	.00	.00	.00	2	2		2	1		0	0	
7060	16		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		2.00	3.00	40.00	.00	.00	.00	.00	1	2		1	1		0	0	
	7070		1.00	1.50	40.00	.00	.00	.00	.00	1	2		3	1		0	0	
7070	17		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5070		2.00	3.00	40.00	.00	.00	.00	.00	1	2		4	1		0	0	TRNVOL
	7060		1.00	1.50	40.00	.00	.00	.00	.00	1	2		1	1		0	0	TRNVOL
	7090		2.00	3.00	40.00	.00	.00	.00	.00	1	2		3	1		0	0	TRNVOL
	8070		1.00	1.50	40.00	.00	.00	.00	.00	1	2		2	1		0	0	TRNVOL
7090	18		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		2.00	3.00	40.00	.00	.00	.00	.00	1	2		1	1		0	0	
8020	19		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5020		3.30	3.30	60.00	.00	.00	.00	.00	3	3		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.00	.00	1	1		3	1		0	0	
	9020		1.00	1.00	60.00	.00	.00	.00	.00	3	3		2	1		0	0	

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REPORT OF OUR SMALL HIGHWAY NETWORK
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PAGE NO. 4
DATE 30JUN91
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NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
8030	20		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5030		3.00	4.50	40.00	.00	.00	.00	.00	1	2		4	1		0	0	TRNVOL
	8020		1.00	1.50	40.00	.00	.00	.00	.00	1	1		1	1		0	0	TRNVOL
	8040		1.00	1.50	40.00	.00	.00	.00	.00	1	1		3	1		0	0	TRNVOL
	9030		1.00	1.50	40.00	.00	.00	.00	.00	1	2		2	1		0	0	TRNVOL
8040	21		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		1.00	1.09	55.05	.00	.00	.00	.00	2	2		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.00	.00	1	1		1	1		0	0	
	8070		3.00	3.27	55.05	.00	.00	.00	.00	2	2		3	1		0	0	
8070	22		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		1.00	1.50	40.00	.00	.00	.00	.00	1	2		4	1		0	0	
	8040		3.00	3.27	55.05	.00	.00	.00	.00	2	2		1	1		0	0	
	8090		2.00	2.18	55.05	.00	.00	.00	.00	2	2		3	1		0	0	
8090	23		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8070		2.00	2.18	55.05	.00	.00	.00	.00	2	2		1	1		0	0	
9020	24		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8020		1.00	1.00	60.00	.00	.00	.00	.00	3	3		4	1		0	0	
9030	25		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8030		1.00	1.50	40.00	.00	.00	.00	.00	1	2		4	1		0	0	

```
$REPORT HIGHWAY PATHS
$FILE
   INPUT FILE = HWYNET, USER ID = $SMNET91.DAT$
$HEADERS
            REPORT OF OUR SMALL HIGHWAY NETWORK IMPEDANCE
                 ***********************************
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$OPTION
   PRINT NONDESTRUCTIVE TRACES
$PARAMETERS
   IMPEDANCE = DISTANCE
$END TP FUNCTIONS
```

Reports the path of minimum impedance on the network. In this case only zone 1 (out of 25) is reported. You can use any of the five impedance measures (time1, time2, cost, user, distance). Reports on both loaded and unloaded networks. See TRANPLAN manual REPORTING section 2-1 to 2-7.

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.20                           COPYRIGHTED BY PFI, 1990                                 TIME  22:08:00


INPUT FILE NAME ---------- HWYNET


   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- HWYNET

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:08:00

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX           XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX   XX         XXXXXXXXXX   XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX   XX         XX      XX   XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX   XX         XX      XX   XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX   XX         XX      XX   XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX    XX         XXXXXXXXXX   XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX           XX         XXXXXXXXXX   XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX           XX         XX      XX   XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX           XXXXXXXXXX XX      XX   XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX           XXXXXXXXXX XX      XX   XX      XX
```

```
*******************************************************************************
*                                                                             *
*                              PATH BUILDER REPORTS                           *
*                                                                             *
*             REPORT OF OUR SMALL HIGHWAY NETWORK IMPEDANCE                   *
*                  ************************************                       *
*                        COPYRIGHTED BY PFI, 1990                             *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER ---------- A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
****
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GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ---------- HWYNET

GENERATION FILE NAME ----- HWYNET

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:07:46 CURRENT TIME ---------- 22:08:00

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

RPTPAT DEFAULTED TO PRINT ZONE 1 ONLY

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TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL HIGHWAY NETWORK IMPEDANCE
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PAGE NO. 1
DATE 30JUN91
TIME 22:08:00

NON-DESTRUCTIVE VINE TRACE - VINE NO. 1

TO	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST
1	HOME NODE													
2		5.00	1030	5.00	3030	3.00	3020	2.00	1020	.00	1			
3		2.00	3020	2.00	1020	.00	1							
4		3.00	3030	3.00	3020	2.00	1020	.00	1					
5		7.00	3070	7.00	3030	3.00	3020	2.00	1020	.00	1			
6		8.00	3080	8.00	3070	7.00	3030	3.00	3020	2.00	1020	.00	1	
7		4.00	4030	4.00	3030	3.00	3020	2.00	1020	.00	1			
8		5.00	4040	5.00	4030	4.00	3030	3.00	3020	2.00	1020	.00	1	
9		8.00	4070	8.00	3070	7.00	3030	3.00	3020	2.00	1020	.00	1	
10		4.00	5020	4.00	3020	2.00	1020	.00	1					
11		5.00	5030	5.00	5020	4.00	3020	2.00	1020	.00	1			
12		6.00	5040	6.00	4040	5.00	4030	4.00	3030	3.00	3020	2.00	1020	.00
	1													
13		9.00	5070	9.00	4070	8.00	4040	5.00	4030	4.00	3030	3.00	3020	2.00
	1020	.00	1											
14		11.00	5090	11.00	5070	9.00	5040	6.00	5030	5.00	4030	4.00	3030	3.00
	3020	2.00	1020	.00	1									
15		8.00	7040	8.00	6140	7.10	5940	6.90	5040	6.00	5030	5.00	4030	4.00
	3030	3.00	3020	2.00	1020	.00	1							
16		10.00	7060	10.00	7040	8.00	6140	7.10	5940	6.90	5040	6.00	5030	5.00
	4030	4.00	3030	3.00	3020	2.00	1020	.00	1					
17		11.00	7070	11.00	7060	10.00	7040	8.00	6140	7.10	5940	6.90	5040	6.00
	5030	5.00	4030	4.00	3030	3.00	3020	2.00	1020	.00	1			
18		13.00	7090	13.00	7070	11.00	5070	9.00	5040	6.00	5030	5.00	4030	4.00
	3030	3.00	3020	2.00	1020	.00	1							
19		7.30	8020	7.30	5020	4.00	3020	2.00	1020	.00	1			

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VERSION 6.20

REPORT OF OUR SMALL HIGHWAY NETWORK IMPEDANCE
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PAGE NO. 2
DATE 30JUN91
TIME 22:08:00

NON-DESTRUCTIVE VINE TRACE - VINE NO. 1

TO	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST	THRU	DIST
20		8.00	8030	8.00	5030	5.00	4030	4.00	3030	3.00	3020	2.00	1020	.00
	1													
21		9.00	8040	9.00	8030	8.00	5030	5.00	4030	4.00	3030	3.00	3020	2.00
	1020	.00	1											
22		12.00	8070	12.00	7070	11.00	5070	9.00	5040	6.00	5030	5.00	4030	4.00
	3030	3.00	3020	2.00	1020	.00	1							
23		14.00	8090	14.00	8070	12.00	8040	9.00	7040	8.00	6140	7.10	5940	6.90
	5040	6.00	5030	5.00	4030	4.00	3030	3.00	3020	2.00	1020	.00	1	
24		8.30	9020	8.30	8020	7.30	5020	4.00	3020	2.00	1020	.00	1	
25		9.00	9030	9.00	8030	8.00	5030	5.00	4030	4.00	3030	3.00	3020	2.00
	1020	.00	1											

```
$PLOT HIGHWAY NETWORK
$FILES
    INPUT FILE = HWYNET, USER ID = $SMNET91.DAT$
    OUTPUT FILE = TPLOT, USER ID = $PNET1.PLT$
$HEADERS
                A PLOT OF OUR SMALL HIGHWAY NETWORK
                ***********************************
                     copyrighted BY pfi, 1990
$OPTIONS
    ONLY CENTROID NODES
$PARAMETERS
    PLOTTER = HP7475
    PAPER = NORMALB
$END TP FUNCTION
```

Plot Highway Network with a pen plotter produces graphic hardcopy of the network base on the X Y coordinates. Three examples are provided. Use Plot Highway Load for a loaded network.

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.20                           COPYRIGHTED BY PFI, 1990                                 TIME  22:08:06

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
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GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- HWYNET

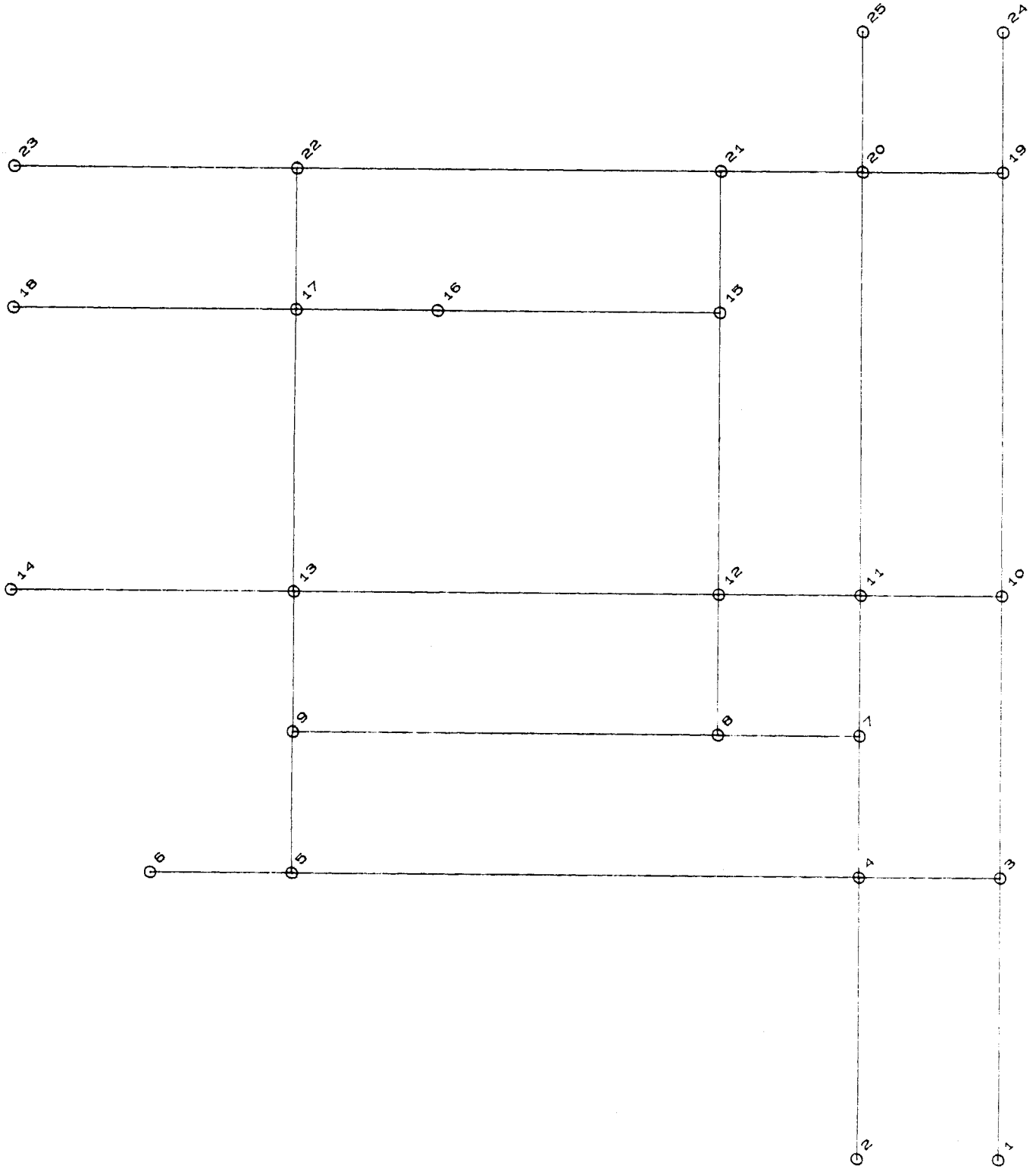
GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:08:06

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```



A PLOT OF OUR SMALL HIGHWAY NETWORK
****
COPYRIGHTED BY PFI. 1990

15NOV90 15: 21: 17

```
DCO/TRANPLAN PLOT PROGRAM--INITIAL CONDITIONS
---------------------------------------------

                  PLOT NETWORK
                  SELECTED ITERATION= 0

PLOT BOUNDARIES--
                  MINX=       100  MAXX=       900
                  MINY=       200  MAXY=       900

SCALE FACTOR-- 1 INCH=     77.78 UNITS, SIZE OF PAPER=  15 (X) --  10(Y) INCHES

     STRIP       LOW      HIGH


         1       100       900

SCALE FACTOR=     77.78  UNITS PER INCH


HEWLETT PACKARD PLOTTER HP7475 -- PAPER TYPE NORMALB  -- SCALING: P1X =    522 AND P1Y =    259

                        END OF COLOR RANGE  1

                                                          END OF PLOT RUN
                                                          --------------
```

```
$PLOT HIGHWAY NETWORK
$FILES
    INPUT FILE = HWYNET, USER ID = $SMNET91.DAT$
    OUTPUT FILE = TPLOT, USER ID = $PNET2.PLT$
$HEADERS
             A PLOT OF OUR SMALL HIGHWAY NETWORK BY SPEED
                ***********************************
                     copyrighted BY pfi, 1990
$OPTIONS
    ONLY CENTROID NODES
$PARAMETERS
    PLOTTER = HP7475
    PAPER = NORMALB
    SELECTION ATTRIBUTE = SPEED1
    NUMBER OF PENS = 6
    COLOR = BLACK, ATTRIBUTE = 35-45
    COLOR = RED, ATTRIBUTE = 50-58
    COLOR = GREEN, ATTRIBUTE = 59-62
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.20                           COPYRIGHTED BY PFI, 1990                                 TIME  22:08:20


INPUT FILE NAME ---------- HWYNET


   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- HWYNET

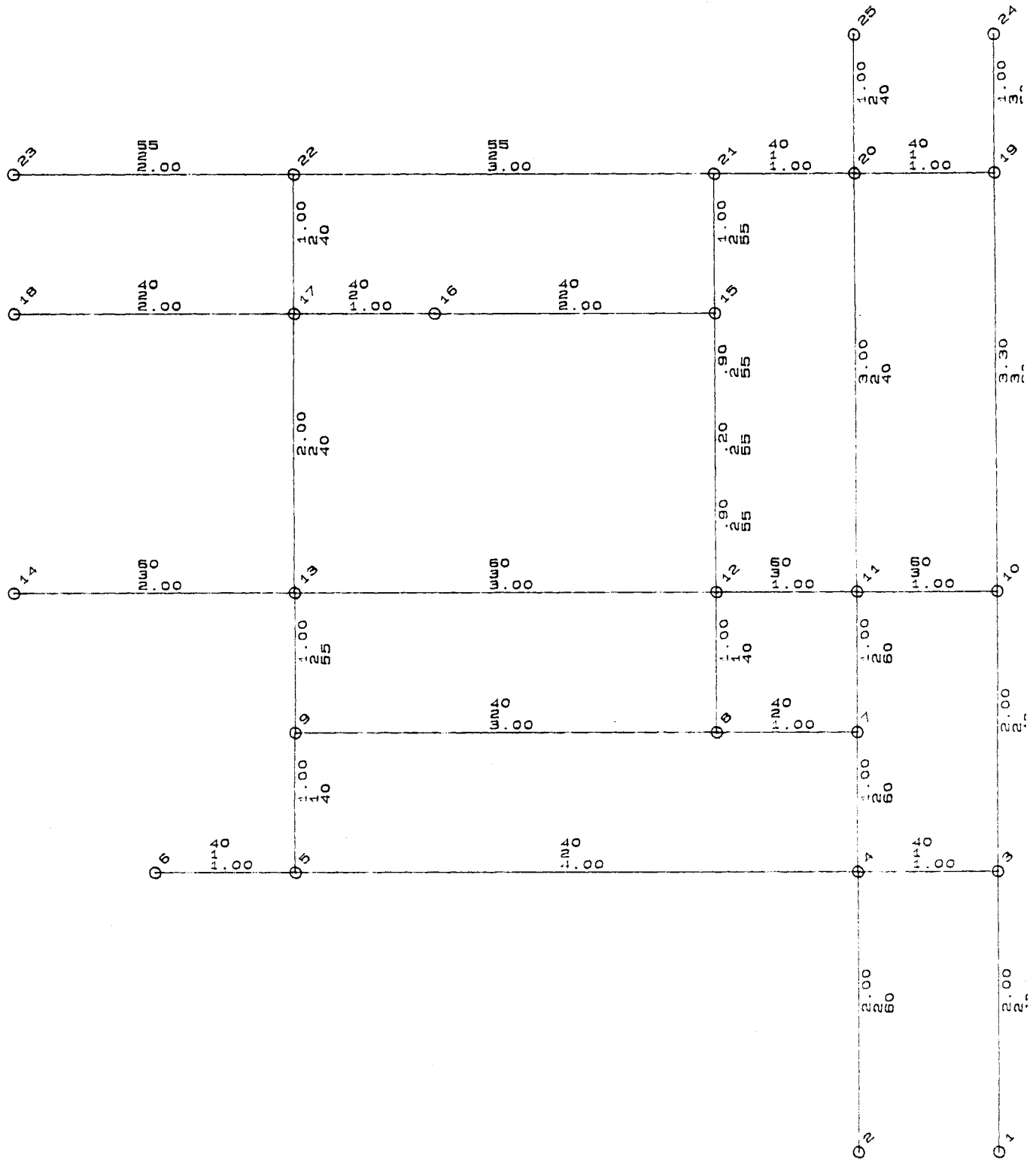
GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:08:20

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```



A ANNOTATED PLOT OF OUR SMALL HIGHWAY NETWORK BY SPEED
****
COPYRIGHTED BY PFI. 1990

15NOV90 15: 23: 50

```
DCO/TRANPLAN PLOT PROGRAM--INITIAL CONDITIONS
---------------------------------------------

                    PLOT NETWORK

                    SELECTION ATTRIBUTE=SPEED 1

SELECTED RANGES--SPEED 1          COLOR          RANGE

                       35                BLACK          1
                       36                BLACK          1
                       37                BLACK          1
                       38                BLACK          1
                       39                BLACK          1
                       40                BLACK          1
                       41                BLACK          1
                       42                BLACK          1
                       43                BLACK          1
                       44                BLACK          1
                       45                BLACK          1
                       50                RED            2
                       51                RED            2
                       52                RED            2
                       53                RED            2
                       54                RED            2
                       55                RED            2
                       56                RED            2
                       57                RED            2
                       58                RED            2
                       59                GREEN          3
                       60                GREEN          3
                       61                GREEN          3
                       62                GREEN          3
                    SELECTED ITERATION= 0

PLOT BOUNDARIES--
                    MINX=       100  MAXX=       900
                    MINY=       200  MAXY=       900

SCALE FACTOR-- 1 INCH=     77.78 UNITS, SIZE OF PAPER=  15 (X) --  10(Y) INCHES

**************************************************
*                                                *
*STARTING COLOR FOR MULTI-COLOR PLOT -- BLACK    *
*         -- ( FOR FRAMES 1 THRU 3 ) --          *
*                                                *
**************************************************


     STRIP       LOW      HIGH


         1       100       900

SCALE FACTOR=     77.78  UNITS PER INCH


HEWLETT PACKARD PLOTTER HP7475 -- PAPER TYPE NORMALB  -- SCALING: P1X =    522 AND P1Y =    259

                         END OF COLOR RANGE  1

                         END OF COLOR RANGE  2

                         END OF COLOR RANGE  3


                                                        END OF PLOT RUN
                                                        --------------
```

```
$PLOT HIGHWAY NETWORK
$FILES
    INPUT FILE = HWYNET, USER ID = $SMNET91.DAT$
    OUTPUT FILE = TPLOT, USER ID = $PNET3.PLT$
$HEADERS
       A ANNOTATED PLOT OF OUR SMALL HIGHWAY NETWORK BY SPEED
                 ***********************************
                      copyrighted BY pfi, 1990
$OPTIONS
    ONLY CENTROID NODES
$PARAMETERS
    PLOTTER = HP7475
    PAPER = NORMALB
    NUMBER OF PENS = 6
    MULTIPLE ANNOTATION = DISTANCE, LINK GROUP 2, SPEED 1
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.20                           COPYRIGHTED BY PFI, 1990                                 TIME  22:08:38

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
-------------------------
.
USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
                                                   COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- HWYNET

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:08:38

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
DCO/TRANPLAN PLOT PROGRAM--INITIAL CONDITIONS
---------------------------------------------

                  PLOT NETWORK
                  SELECTED ITERATION= 0

PLOT BOUNDARIES--
                  MINX=       100  MAXX=       900
                  MINY=       200  MAXY=       900

SCALE FACTOR-- 1 INCH=     77.78 UNITS, SIZE OF PAPER=  15 (X) --  10(Y) INCHES

     STRIP       LOW      HIGH


         1       100       900

SCALE FACTOR=     77.78  UNITS PER INCH


HEWLETT PACKARD PLOTTER HP7475 -- PAPER TYPE NORMALB  -- SCALING: P1X =    522 AND P1Y =    259

                        END OF COLOR RANGE  1


                                                          END OF PLOT RUN
                                                          --------------
```

```
$BUILD COST USER NETWORK
$FILES
     INPUT FILE = CUSIN, USER ID = $SMNET91.DAT$
     OUTPUT FILE = CUSOUT, USER ID = $SN91CAR.CST$
$DATA
    LINEAR SET = 1, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.283
     LINK GROUP 1 = 1
    LINEAR SET = 2, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.203
     LINK GROUP 1 = 2
    LINEAR SET = 3, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.213
     LINK GROUP 1 = 3
$END TP FUNCTION
```

This function allows the addition of the cost of driving a link. See TRANPLAN section Networks 3-1 to 3-4. Cost is made up of a time cost and a distance cost. This will be done for each of the four vehicle types. In this case cars cost 28.3 cent per mile on gravel, 20.3 cents at 55 mph, and 21.3 cents at 60 mph. In this case "time" cost were included in the per mile cost.

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
 TRANPLAN SYSTEM                 ***********************************************                  DATE   30JUN91
   VERSION 6.11                          COPYRIGHTED BY PFI, 1990                                 TIME  22:09:04


 INPUT FILE NAME ---------- CUSIN

    FILE CHARACTERISTICS
 --------------------------

 USER FILE IDENTIFICATION - SMNET91.DAT

 FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                           ***********************************************
                                                   COPYRIGHTED BY PFI, 1990

 GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

 TYPE OF FILE ------------- HWYNET

 GENERATION FILE NAME ----- HWYNET

 GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

 GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:09:04

 FILE SIZE ---------------- MAXIMUM ZONE      =    25

                            MAXIMUM NODE NO.  =  9030

                            NUMBER OF LINKS   =   118


NUMBER OF LINKS FOR WHICH DEFAULT COST RELATIONSHIP WAS USED =        50
```

```
$BUILD COST USER NETWORK
$FILES
     INPUT FILE = CUSIN, USER ID = $SMNET91.DAT$
     OUTPUT FILE = CUSOUT, USER ID = $SN91FB.CST$
$DATA
    LINEAR SET = 1, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.338
     LINK GROUP 1 = 1
    LINEAR SET = 2, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.244
     LINK GROUP 1 = 2
    LINEAR SET = 3, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.256
     LINK GROUP 1 = 3
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.11                           COPYRIGHTED BY PFI, 1990                                 TIME  22:09:10


INPUT FILE NAME ---------- CUSIN


   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
                                                   COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- HWYNET

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:09:10

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118


NUMBER OF LINKS FOR WHICH DEFAULT COST RELATIONSHIP WAS USED =        50
```

```
$BUILD COST USER NETWORK
$FILES
     INPUT FILE = CUSIN, USER ID = $SMNET91.DAT$
     OUTPUT FILE = CUSOUT, USER ID = $SN91FMG.CST$
$DATA
    LINEAR SET = 1, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.56
     LINK GROUP 1 = 1
    LINEAR SET = 2, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.384
     LINK GROUP 1 = 2
    LINEAR SET = 3, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.403
     LINK GROUP 1 = 3
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
 TRANPLAN SYSTEM                 ***********************************************                  DATE   30JUN91
   VERSION 6.11                          COPYRIGHTED BY PFI, 1990                                 TIME  22:09:17

 INPUT FILE NAME ---------- CUSIN

    FILE CHARACTERISTICS
 -------------------------

 USER FILE IDENTIFICATION - SMNET91.DAT

 FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                           ***********************************************
                                                   COPYRIGHTED BY PFI, 1990

 GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

 TYPE OF FILE ------------- HWYNET

 GENERATION FILE NAME ----- HWYNET

 GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

 GENERATION TIME ---------- 22:07:46                                         CURRENT TIME ---------- 22:09:17

 FILE SIZE ---------------- MAXIMUM ZONE      =    25

                            MAXIMUM NODE NO.  =  9030

                            NUMBER OF LINKS   =   118

NUMBER OF LINKS FOR WHICH DEFAULT COST RELATIONSHIP WAS USED =        50
```

```
$BUILD COST USER NETWORK
$FILES
     INPUT FILE = CUSIN, USER ID = $SMNET91X.DAT$
     OUTPUT FILE = CUSOUT, USER ID = $SN91FMB.CST$
$DATA
    LINEAR SET = 1, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.803
     LINK GROUP 1 = 1
    LINEAR SET = 2, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.535
     LINK GROUP 1 = 2
    LINEAR SET = 3, UNIT TIME COST = 0.0
     UNIT DISTANCE COST = 0.562
     LINK GROUP 1 = 3
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
 TRANPLAN SYSTEM                 *********************************************                    DATE   30JUN91
   VERSION 6.11                  COPYRIGHTED BY PROGRAMMING FOR IMBECILES 1990                    TIME  22:09:24


 INPUT FILE NAME ---------- CUSIN


    FILE CHARACTERISTICS
 -------------------------

 USER FILE IDENTIFICATION - SMNET91.DAT

 FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                           *********************************************
                                           COPYRIGHTED BY PROGRAMMING FOR IMBECILES 1990

 GENERATING FUNCTION ------ NETWORK EDITING AND DISPLAY

 TYPE OF FILE ------------- HWYNET

 GENERATION FILE NAME ----- HWYNET

 GENERATION DATE ---------- 01MAR91                                          CURRENT DATE ----------  30JUN91

 GENERATION TIME ---------- 10:57:44                                         CURRENT TIME ---------- 22:09:24

 FILE SIZE ---------------- MAXIMUM ZONE      =    25

                            MAXIMUM NODE NO.  =  9030

                            NUMBER OF LINKS   =   116


NUMBER OF LINKS FOR WHICH DEFAULT COST RELATIONSHIP WAS USED =        50
```

```
$REPORT HIGHWAY NETWORK
$FILE
   INPUT FILE = HWYNET, USER ID = $SN91CAR.CST$
$HEADERS
           REPORT OF OUR SMALL HIGHWAY NETWORK W/CAR COST
                ***********************************
                      copyrighted BY pfi, 1990
$OPTION
   PRINT COORDINATES
   DETAIL
$PARAMETERS
   IMPEDANCE = TIME 1
$END TP FUNCTIONS
```

Report of the "cost" of each of the four vehicle types by link.

```
   DCCO / UAG                        A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                          PAGE NO.     1
TRANPLAN SYSTEM                      ***********************************************                        DATE   30JUN91
  VERSION 6.10                                COPYRIGHTED BY PFI, 1990                                      TIME  22:09:31


INPUT FILE NAME ---------- HWYNET


   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91CAR.CST

FILE HEADER --------------                 A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                           ***********************************************
                                                   COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:04                                                   CURRENT TIME ---------- 22:09:31

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX    XXXXXXXX    XXXXXXXX          XX  XX     XX    XXXXXX     XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX        XX  XX     XX   XXXXXXXX   XXXXXXXXXX
XX      XX   XX      XX  XX      XX       XX   XX     XX   XX      XX  XX      XX
XX      XX   XX          XX      XX      XX    XX     XX   XX      XX  XX
XX      XX   XX          XX      XX     XX     XX     XX   XX      XX  XX
XX      XX   XX          XX      XX    XX      XX     XX   XXXXXXXXXX  XX    XXXX
XX      XX   XX          XX      XX   XX       XX     XX   XX      XX  XX      XX
XX      XX   XX      XX  XX      XX  XX        XX     XX   XX      XX  XX      XX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX  XX         XXXXXXXXXX  XX      XX  XXXXXXXXXX
XXXXXXXXX    XXXXXXXX    XXXXXXXX  XX           XXXXXXXX   XX      XX   XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX    XXXXXXXX  XX      XX  XXXXXXXXX   XX          XXXXXXXX  XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX XXX     XX  XXXXXXXXXX  XX         XXXXXXXXXX XXX     XX
    XX       XX      XX   XX      XX XXXX    XX  XX      XX  XX         XX      XX XXXX    XX
    XX       XX      XX   XX      XX XX XX   XX  XX      XX  XX         XX      XX XX XX   XX
    XX       XXXXXXXXXX   XX      XX XX  XX  XX  XXXXXXXXXX  XX         XX      XX XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX XX  XX  XX  XXXXXXXXX   XX         XXXXXXXXXX XX  XX  XX
    XX       XX   XX      XXXXXXXXXX XX   XX XX  XX          XX         XXXXXXXXXX XX   XX XX
    XX       XX    XX     XX      XX XX    XXXX  XX          XX         XX      XX XX    XXXX
    XX       XX     XX    XX      XX XX     XXX  XX          XXXXXXXXXX XX      XX XX     XXX
    XX       XX      XX   XX      XX XX      XX  XX          XXXXXXXXXX XX      XX XX      XX
```

```
*******************************************************************************
*                                                                             *
*                          HIGHWAY NETWORK REPORTS                            *
*                                                                             *
*          REPORT OF OUR SMALL HIGHWAY NETWORK W/CAR COST                     *
*               ***********************************                           *
*                     COPYRIGHTED BY PFI, 1990                                *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91CAR.CST

FILE HEADER ---------- A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
****
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ---------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:09:04 CURRENT TIME ---------- 22:09:31

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK W/CAR COST
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NODE COORDINATES

NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD
1	100	200	2	100	300	3	300	200	4	300	300	5	300	700
6	300	800	7	400	300	8	400	400	9	400	700	10	500	200
11	500	300	12	500	400	13	500	700	14	500	900	15	700	400
16	700	600	17	700	700	18	700	900	19	800	200	20	800	300
21	800	400	22	800	700	23	800	900	24	900	200	25	900	300
1020	100	200	1030	100	300	3020	300	200	3030	300	300	3070	300	700
3080	300	800	4030	400	300	4040	400	400	4070	400	700	5020	500	200
5030	500	300	5040	500	400	5070	500	700	5090	500	900	5940	590	400
6140	610	400	7040	700	400	7060	700	600	7070	700	700	7090	700	900
8020	800	200	8030	800	300	8040	800	400	8070	800	700	8090	800	900
9020	900	200	9030	900	300									

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK W/CAR COST
****
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PAGE NO. 1
DATE 30JUN91
TIME 22:09:31

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME
1	1020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
2	1030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
3	3020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
4	3030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
5	3070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
6	3080		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
7	4030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
8	4040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
9	4070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
10	5020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
11	5030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
12	5040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
13	5070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
14	5090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
15	7040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
16	7060		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
17	7070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
18	7090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
19	8020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
20	8030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
21	8040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
22	8070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
23	8090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
24	9020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
25	9030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK W/CAR COST
****
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PAGE NO. 2
DATE 30JUN91
TIME 22:09:31

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
1020	1		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	.57	.00	1	2		2	1		0	0	
1030	2		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		2.00	2.00	60.00	.00	.00	.43	.00	3	2		2	1		0	0	
3020	3		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	1020		2.00	3.00	40.00	.00	.00	.57	.00	1	2		4	1		0	0	
	3030		1.00	1.50	40.00	.00	.00	.28	.00	1	1		3	1		0	0	
	5020		2.00	3.00	40.00	.00	.00	.57	.00	1	2		2	1		0	0	
3030	4		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	1030		2.00	2.00	60.00	.00	.00	.43	.00	3	2		4	1		0	0	TRNVOL
	3020		1.00	1.50	40.00	.00	.00	.28	.00	1	1		1	1		0	0	TRNVOL
	3070		4.00	6.00	40.00	.00	.00	1.13	.00	1	2		3	1		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.21	.00	3	2		2	1		0	0	TRNVOL
3070	5		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		4.00	6.00	40.00	.00	.00	1.13	.00	1	2		1	1		0	0	
	3080		1.00	1.50	40.00	.00	.00	.28	.00	1	1		3	1		0	0	
	4070		1.00	1.50	40.00	.00	.00	.28	.00	1	1		2	1		0	0	
3080	6		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.28	.00	1	1		1	1		0	0	
4030	7		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		1.00	1.00	60.00	.00	.00	.21	.00	3	2		4	1		0	0	
	4040		1.00	1.50	40.00	.00	.00	.28	.00	1	2		3	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.21	.00	3	2		2	1		0	0	
4040	8		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	4030		1.00	1.50	40.00	.00	.00	.28	.00	1	2		1	1		0	0	
	4070		3.00	4.50	40.00	.00	.00	.85	.00	1	2		3	1		0	0	
	5040		1.00	1.50	40.00	.00	.00	.28	.00	1	1		2	1		0	0	
4070	9		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.28	.00	1	1		4	1		0	0	
	4040		3.00	4.50	40.00	.00	.00	.85	.00	1	2		1	1		0	0	
	5070		1.00	1.09	55.05	.00	.00	.20	.00	2	2		2	1		0	0	
5020	10		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	.57	.00	1	2		4	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.21	.00	3	3		3	1		0	0	
	8020		3.30	3.30	60.00	.00	.00	.70	.00	3	3		2	1		0	0	

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REPORT OF OUR SMALL HIGHWAY NETWORK W/CAR COST
****
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PAGE NO. 3
DATE 30JUN91
TIME 22:09:31

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
5030	11		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.21	.00	3	2		4	1		0	0	TRNVOL
	5020		1.00	1.00	60.00	.00	.00	.21	.00	3	3		1	1		0	0	TRNVOL
	5040		1.00	1.00	60.00	.00	.00	.21	.00	3	3		3	1		0	0	TRNVOL
	8030		3.00	4.50	40.00	.00	.00	.85	.00	1	2		2	1		0	0	TRNVOL
5040	12		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4040		1.00	1.50	40.00	.00	.00	.28	.00	1	1		4	1		0	0	TRNVOL
	5030		1.00	1.00	60.00	.00	.00	.21	.00	3	3		1	1		0	0	TRNVOL
	5070		3.00	3.00	60.00	.00	.00	.64	.00	3	3		3	1		0	0	TRNVOL
	5940		.90	.98	55.10	.00	.00	.18	.00	2	2		2	1		0	0	TRNVOL
5070	13		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4070		1.00	1.09	55.05	.00	.00	.20	.00	2	2		4	1		0	0	TRNVOL
	5040		3.00	3.00	60.00	.00	.00	.64	.00	3	3		1	1		0	0	TRNVOL
	5090		2.00	2.00	60.00	.00	.00	.43	.00	3	3		3	1		0	0	TRNVOL
	7070		2.00	3.00	40.00	.00	.00	.57	.00	1	2		2	1		0	0	TRNVOL
5090	14		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5070		2.00	2.00	60.00	.00	.00	.43	.00	3	3		1	1		0	0	
5940	5040		.90	.98	55.10	.00	.00	.18	.00	2	2		4	1		0	0	
	6140		.20	.22	54.55	.00	.00	.04	.00	2	2		2	1		0	0	
6140	5940		.20	.22	54.55	.00	.00	.04	.00	2	2		4	1		0	0	
	7040		.90	.98	55.10	.00	.00	.18	.00	2	2		2	1		0	0	
7040	15		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	6140		.90	.98	55.10	.00	.00	.18	.00	2	2		4	1		0	0	
	7060		2.00	3.00	40.00	.00	.00	.57	.00	1	2		3	1		0	0	
	8040		1.00	1.09	55.05	.00	.00	.20	.00	2	2		2	1		0	0	
7060	16		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		2.00	3.00	40.00	.00	.00	.57	.00	1	2		1	1		0	0	
	7070		1.00	1.50	40.00	.00	.00	.28	.00	1	2		3	1		0	0	
7070	17		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5070		2.00	3.00	40.00	.00	.00	.57	.00	1	2		4	1		0	0	TRNVOL
	7060		1.00	1.50	40.00	.00	.00	.28	.00	1	2		1	1		0	0	TRNVOL
	7090		2.00	3.00	40.00	.00	.00	.57	.00	1	2		3	1		0	0	TRNVOL
	8070		1.00	1.50	40.00	.00	.00	.28	.00	1	2		2	1		0	0	TRNVOL
7090	18		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		2.00	3.00	40.00	.00	.00	.57	.00	1	2		1	1		0	0	
8020	19		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5020		3.30	3.30	60.00	.00	.00	.70	.00	3	3		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.28	.00	1	1		3	1		0	0	
	9020		1.00	1.00	60.00	.00	.00	.21	.00	3	3		2	1		0	0	

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REPORT OF OUR SMALL HIGHWAY NETWORK W/CAR COST
****
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PAGE NO. 4
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TIME 22:09:31

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
8030	20		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5030		3.00	4.50	40.00	.00	.00	.85	.00	1	2		4	1		0	0	TRNVOL
	8020		1.00	1.50	40.00	.00	.00	.28	.00	1	1		1	1		0	0	TRNVOL
	8040		1.00	1.50	40.00	.00	.00	.28	.00	1	1		3	1		0	0	TRNVOL
	9030		1.00	1.50	40.00	.00	.00	.28	.00	1	2		2	1		0	0	TRNVOL
8040	21		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		1.00	1.09	55.05	.00	.00	.20	.00	2	2		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.28	.00	1	1		1	1		0	0	
	8070		3.00	3.27	55.05	.00	.00	.61	.00	2	2		3	1		0	0	
8070	22		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		1.00	1.50	40.00	.00	.00	.28	.00	1	2		4	1		0	0	
	8040		3.00	3.27	55.05	.00	.00	.61	.00	2	2		1	1		0	0	
	8090		2.00	2.18	55.05	.00	.00	.41	.00	2	2		3	1		0	0	
8090	23		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8070		2.00	2.18	55.05	.00	.00	.41	.00	2	2		1	1		0	0	
9020	24		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8020		1.00	1.00	60.00	.00	.00	.21	.00	3	3		4	1		0	0	
9030	25		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8030		1.00	1.50	40.00	.00	.00	.28	.00	1	2		4	1		0	0	

```
$REPORT HIGHWAY NETWORK
$FILE
   INPUT FILE = HWYNET, USER ID = $SN91FB.CST$
$HEADERS
           REPORT OF OUR SMALL HIGHWAY NETWORK W/PICKUP COST
                 ***********************************
                      copyrighted BY pfi, 1990
$OPTION
   PRINT COORDINATES
   DETAIL
$PARAMETERS
   IMPEDANCE = TIME 1
$END TP FUNCTIONS
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ********************************************                     DATE   30JUN91
  VERSION 6.10                           COPYRIGHTED BY PFI, 1990                                  TIME  22:09:38

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FB.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ********************************************
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:11                                         CURRENT TIME ---------- 22:09:38

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX             XXXXXXXX   XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX           XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX  XX          XXXXXXXXXX  XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX  XX          XX      XX  XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX  XX          XX      XX  XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX  XX          XX      XX  XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX   XX          XXXXXXXXXX  XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX          XX          XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX          XX          XX      XX  XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX          XXXXXXXXXX  XX      XX  XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX          XXXXXXXXXX  XX      XX  XX      XX
```

```
*****************************************************************************************
*                                                                                       *
*                                HIGHWAY NETWORK REPORTS                                *
*                                                                                       *
*              REPORT OF OUR SMALL HIGHWAY NETWORK W/PICKUP COST                        *
*                    ***********************************                                *
*                         COPYRIGHTED BY PFI, 1990                                      *
*                                                                                       *
*****************************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FB.CST

FILE HEADER ---------- A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
****
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ---------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:09:11 CURRENT TIME ---------- 22:09:38

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

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REPORT OF OUR SMALL HIGHWAY NETWORK W/PICKUP COST
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NODE COORDINATES

NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD
1	100	200	2	100	300	3	300	200	4	300	300	5	300	700
6	300	800	7	400	300	8	400	400	9	400	700	10	500	200
11	500	300	12	500	400	13	500	700	14	500	900	15	700	400
16	700	600	17	700	700	18	700	900	19	800	200	20	800	300
21	800	400	22	800	700	23	800	900	24	900	200	25	900	300
1020	100	200	1030	100	300	3020	300	200	3030	300	300	3070	300	700
3080	300	800	4030	400	300	4040	400	400	4070	400	700	5020	500	200
5030	500	300	5040	500	400	5070	500	700	5090	500	900	5940	590	400
6140	610	400	7040	700	400	7060	700	600	7070	700	700	7090	700	900
8020	800	200	8030	800	300	8040	800	400	8070	800	700	8090	800	900
9020	900	200	9030	900	300									

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REPORT OF OUR SMALL HIGHWAY NETWORK W/PICKUP COST
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PAGE NO. 1
DATE 30JUN91
TIME 22:09:38

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME
1	1020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
2	1030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
3	3020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
4	3030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
5	3070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
6	3080		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
7	4030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
8	4040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
9	4070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
10	5020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
11	5030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
12	5040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
13	5070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
14	5090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
15	7040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
16	7060		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
17	7070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
18	7090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
19	8020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
20	8030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
21	8040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
22	8070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
23	8090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
24	9020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
25	9030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0

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REPORT OF OUR SMALL HIGHWAY NETWORK W/PICKUP COST
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PAGE NO. 2
DATE 30JUN91
TIME 22:09:38

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
1020	1		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	.68	.00	1	2		2	1		0	0	
1030	2		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		2.00	2.00	60.00	.00	.00	.51	.00	3	2		2	1		0	0	
3020	3		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	1020		2.00	3.00	40.00	.00	.00	.68	.00	1	2		4	1		0	0	
	3030		1.00	1.50	40.00	.00	.00	.34	.00	1	1		3	1		0	0	
	5020		2.00	3.00	40.00	.00	.00	.68	.00	1	2		2	1		0	0	
3030	4		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	1030		2.00	2.00	60.00	.00	.00	.51	.00	3	2		4	1		0	0	TRNVOL
	3020		1.00	1.50	40.00	.00	.00	.34	.00	1	1		1	1		0	0	TRNVOL
	3070		4.00	6.00	40.00	.00	.00	1.35	.00	1	2		3	1		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.26	.00	3	2		2	1		0	0	TRNVOL
3070	5		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		4.00	6.00	40.00	.00	.00	1.35	.00	1	2		1	1		0	0	
	3080		1.00	1.50	40.00	.00	.00	.34	.00	1	1		3	1		0	0	
	4070		1.00	1.50	40.00	.00	.00	.34	.00	1	1		2	1		0	0	
3080	6		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.34	.00	1	1		1	1		0	0	
4030	7		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		1.00	1.00	60.00	.00	.00	.26	.00	3	2		4	1		0	0	
	4040		1.00	1.50	40.00	.00	.00	.34	.00	1	2		3	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.26	.00	3	2		2	1		0	0	
4040	8		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	4030		1.00	1.50	40.00	.00	.00	.34	.00	1	2		1	1		0	0	
	4070		3.00	4.50	40.00	.00	.00	1.01	.00	1	2		3	1		0	0	
	5040		1.00	1.50	40.00	.00	.00	.34	.00	1	1		2	1		0	0	
4070	9		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.34	.00	1	1		4	1		0	0	
	4040		3.00	4.50	40.00	.00	.00	1.01	.00	1	2		1	1		0	0	
	5070		1.00	1.09	55.05	.00	.00	.24	.00	2	2		2	1		0	0	
5020	10		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	.68	.00	1	2		4	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.26	.00	3	3		3	1		0	0	
	8020		3.30	3.30	60.00	.00	.00	.84	.00	3	3		2	1		0	0	

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REPORT OF OUR SMALL HIGHWAY NETWORK W/PICKUP COST
****
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PAGE NO. 3
DATE 30JUN91
TIME 22:09:38

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
5030	11		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.26	.00	3	2		4	1		0	0	TRNVOL
	5020		1.00	1.00	60.00	.00	.00	.26	.00	3	3		1	1		0	0	TRNVOL
	5040		1.00	1.00	60.00	.00	.00	.26	.00	3	3		3	1		0	0	TRNVOL
	8030		3.00	4.50	40.00	.00	.00	1.01	.00	1	2		2	1		0	0	TRNVOL
5040	12		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4040		1.00	1.50	40.00	.00	.00	.34	.00	1	1		4	1		0	0	TRNVOL
	5030		1.00	1.00	60.00	.00	.00	.26	.00	3	3		1	1		0	0	TRNVOL
	5070		3.00	3.00	60.00	.00	.00	.77	.00	3	3		3	1		0	0	TRNVOL
	5940		.90	.98	55.10	.00	.00	.22	.00	2	2		2	1		0	0	TRNVOL
5070	13		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4070		1.00	1.09	55.05	.00	.00	.24	.00	2	2		4	1		0	0	TRNVOL
	5040		3.00	3.00	60.00	.00	.00	.77	.00	3	3		1	1		0	0	TRNVOL
	5090		2.00	2.00	60.00	.00	.00	.51	.00	3	3		3	1		0	0	TRNVOL
	7070		2.00	3.00	40.00	.00	.00	.68	.00	1	2		2	1		0	0	TRNVOL
5090	14		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5070		2.00	2.00	60.00	.00	.00	.51	.00	3	3		1	1		0	0	
5940	5040		.90	.98	55.10	.00	.00	.22	.00	2	2		4	1		0	0	
	6140		.20	.22	54.55	.00	.00	.05	.00	2	2		2	1		0	0	
6140	5940		.20	.22	54.55	.00	.00	.05	.00	2	2		4	1		0	0	
	7040		.90	.98	55.10	.00	.00	.22	.00	2	2		2	1		0	0	
7040	15		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	6140		.90	.98	55.10	.00	.00	.22	.00	2	2		4	1		0	0	
	7060		2.00	3.00	40.00	.00	.00	.68	.00	1	2		3	1		0	0	
	8040		1.00	1.09	55.05	.00	.00	.24	.00	2	2		2	1		0	0	
7060	16		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		2.00	3.00	40.00	.00	.00	.68	.00	1	2		1	1		0	0	
	7070		1.00	1.50	40.00	.00	.00	.34	.00	1	2		3	1		0	0	
7070	17		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5070		2.00	3.00	40.00	.00	.00	.68	.00	1	2		4	1		0	0	TRNVOL
	7060		1.00	1.50	40.00	.00	.00	.34	.00	1	2		1	1		0	0	TRNVOL
	7090		2.00	3.00	40.00	.00	.00	.68	.00	1	2		3	1		0	0	TRNVOL
	8070		1.00	1.50	40.00	.00	.00	.34	.00	1	2		2	1		0	0	TRNVOL
7090	18		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		2.00	3.00	40.00	.00	.00	.68	.00	1	2		1	1		0	0	
8020	19		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5020		3.30	3.30	60.00	.00	.00	.84	.00	3	3		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.34	.00	1	1		3	1		0	0	
	9020		1.00	1.00	60.00	.00	.00	.26	.00	3	3		2	1		0	0	

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REPORT OF OUR SMALL HIGHWAY NETWORK W/PICKUP COST
****
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PAGE NO. 4
DATE 30JUN91
TIME 22:09:38

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
8030	20		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5030		3.00	4.50	40.00	.00	.00	1.01	.00	1	2		4	1		0	0	TRNVOL
	8020		1.00	1.50	40.00	.00	.00	.34	.00	1	1		1	1		0	0	TRNVOL
	8040		1.00	1.50	40.00	.00	.00	.34	.00	1	1		3	1		0	0	TRNVOL
	9030		1.00	1.50	40.00	.00	.00	.34	.00	1	2		2	1		0	0	TRNVOL
8040	21		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		1.00	1.09	55.05	.00	.00	.24	.00	2	2		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.34	.00	1	1		1	1		0	0	
	8070		3.00	3.27	55.05	.00	.00	.73	.00	2	2		3	1		0	0	
8070	22		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		1.00	1.50	40.00	.00	.00	.34	.00	1	2		4	1		0	0	
	8040		3.00	3.27	55.05	.00	.00	.73	.00	2	2		1	1		0	0	
	8090		2.00	2.18	55.05	.00	.00	.49	.00	2	2		3	1		0	0	
8090	23		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8070		2.00	2.18	55.05	.00	.00	.49	.00	2	2		1	1		0	0	
9020	24		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8020		1.00	1.00	60.00	.00	.00	.26	.00	3	3		4	1		0	0	
9030	25		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8030		1.00	1.50	40.00	.00	.00	.34	.00	1	2		4	1		0	0	

```
$REPORT HIGHWAY NETWORK
$FILE
   INPUT FILE = HWYNET, USER ID = $SN91FMG.CST$
$HEADERS
           REPORT OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCK COST
                 ***********************************
                      copyrighted BY pfi, 1990
$OPTION
   PRINT COORDINATES
   DETAIL
$PARAMETERS
   IMPEDANCE = TIME 1
$END TP FUNCTIONS
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  *********************************************                    DATE   30JUN91
  VERSION 6.10                            COPYRIGHTED BY PFI, 1990                                TIME  22:09:46


INPUT FILE NAME ---------- HWYNET


   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - SN91FMG.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          *********************************************
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:17                                         CURRENT TIME ---------- 22:09:46

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX    XX      XX   XXXXXXXXX    XX            XXXXXXXX    XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX   XX           XXXXXXXXXX   XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX   XX           XX      XX   XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX   XX           XX      XX   XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX   XX           XX      XX   XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX    XX           XXXXXXXXXX   XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX           XX           XXXXXXXXXX   XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX           XX           XX      XX   XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX           XXXXXXXXXX   XX      XX   XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX           XXXXXXXXXX   XX      XX   XX      XX
```

```
*******************************************************************************
*                                                                             *
*                            HIGHWAY NETWORK REPORTS                          *
*                                                                             *
*            REPORT OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCK COST            *
*                  ***********************************                        *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FMG.CST

FILE HEADER ---------- A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
****
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ---------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:09:17 CURRENT TIME ---------- 22:09:46

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

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REPORT OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCK COST
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NODE COORDINATES

NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD
1	100	200	2	100	300	3	300	200	4	300	300	5	300	700
6	300	800	7	400	300	8	400	400	9	400	700	10	500	200
11	500	300	12	500	400	13	500	700	14	500	900	15	700	400
16	700	600	17	700	700	18	700	900	19	800	200	20	800	300
21	800	400	22	800	700	23	800	900	24	900	200	25	900	300
1020	100	200	1030	100	300	3020	300	200	3030	300	300	3070	300	700
3080	300	800	4030	400	300	4040	400	400	4070	400	700	5020	500	200
5030	500	300	5040	500	400	5070	500	700	5090	500	900	5940	590	400
6140	610	400	7040	700	400	7060	700	600	7070	700	700	7090	700	900
8020	800	200	8030	800	300	8040	800	400	8070	800	700	8090	800	900
9020	900	200	9030	900	300									

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REPORT OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCK COST
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NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME
1	1020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
2	1030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
3	3020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
4	3030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
5	3070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
6	3080		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
7	4030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
8	4040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
9	4070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
10	5020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
11	5030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
12	5040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
13	5070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
14	5090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
15	7040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
16	7060		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
17	7070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
18	7090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
19	8020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
20	8030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
21	8040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
22	8070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
23	8090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
24	9020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
25	9030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0

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REPORT OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCK COST
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NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
1020	1		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		2	1		0	0	
1030	2		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		2.00	2.00	60.00	.00	.00	.81	.00	3	2		2	1		0	0	
3020	3		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	1020		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		4	1		0	0	
	3030		1.00	1.50	40.00	.00	.00	.56	.00	1	1		3	1		0	0	
	5020		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		2	1		0	0	
3030	4		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	1030		2.00	2.00	60.00	.00	.00	.81	.00	3	2		4	1		0	0	TRNVOL
	3020		1.00	1.50	40.00	.00	.00	.56	.00	1	1		1	1		0	0	TRNVOL
	3070		4.00	6.00	40.00	.00	.00	2.24	.00	1	2		3	1		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.40	.00	3	2		2	1		0	0	TRNVOL
3070	5		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		4.00	6.00	40.00	.00	.00	2.24	.00	1	2		1	1		0	0	
	3080		1.00	1.50	40.00	.00	.00	.56	.00	1	1		3	1		0	0	
	4070		1.00	1.50	40.00	.00	.00	.56	.00	1	1		2	1		0	0	
3080	6		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.56	.00	1	1		1	1		0	0	
4030	7		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		1.00	1.00	60.00	.00	.00	.40	.00	3	2		4	1		0	0	
	4040		1.00	1.50	40.00	.00	.00	.56	.00	1	2		3	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.40	.00	3	2		2	1		0	0	
4040	8		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	4030		1.00	1.50	40.00	.00	.00	.56	.00	1	2		1	1		0	0	
	4070		3.00	4.50	40.00	.00	.00	1.68	.00	1	2		3	1		0	0	
	5040		1.00	1.50	40.00	.00	.00	.56	.00	1	1		2	1		0	0	
4070	9		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.56	.00	1	1		4	1		0	0	
	4040		3.00	4.50	40.00	.00	.00	1.68	.00	1	2		1	1		0	0	
	5070		1.00	1.09	55.05	.00	.00	.38	.00	2	2		2	1		0	0	
5020	10		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		4	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.40	.00	3	3		3	1		0	0	
	8020		3.30	3.30	60.00	.00	.00	1.33	.00	3	3		2	1		0	0	

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VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCK COST
****
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PAGE NO. 3
DATE 30JUN91
TIME 22:09:46

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
5030	11		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.40	.00	3	2		4	1		0	0	TRNVOL
	5020		1.00	1.00	60.00	.00	.00	.40	.00	3	3		1	1		0	0	TRNVOL
	5040		1.00	1.00	60.00	.00	.00	.40	.00	3	3		3	1		0	0	TRNVOL
	8030		3.00	4.50	40.00	.00	.00	1.68	.00	1	2		2	1		0	0	TRNVOL
5040	12		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4040		1.00	1.50	40.00	.00	.00	.56	.00	1	1		4	1		0	0	TRNVOL
	5030		1.00	1.00	60.00	.00	.00	.40	.00	3	3		1	1		0	0	TRNVOL
	5070		3.00	3.00	60.00	.00	.00	1.21	.00	3	3		3	1		0	0	TRNVOL
	5940		.90	.98	55.10	.00	.00	.35	.00	2	2		2	1		0	0	TRNVOL
5070	13		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4070		1.00	1.09	55.05	.00	.00	.38	.00	2	2		4	1		0	0	TRNVOL
	5040		3.00	3.00	60.00	.00	.00	1.21	.00	3	3		1	1		0	0	TRNVOL
	5090		2.00	2.00	60.00	.00	.00	.81	.00	3	3		3	1		0	0	TRNVOL
	7070		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		2	1		0	0	TRNVOL
5090	14		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5070		2.00	2.00	60.00	.00	.00	.81	.00	3	3		1	1		0	0	
5940	5040		.90	.98	55.10	.00	.00	.35	.00	2	2		4	1		0	0	
	6140		.20	.22	54.55	.00	.00	.08	.00	2	2		2	1		0	0	
6140	5940		.20	.22	54.55	.00	.00	.08	.00	2	2		4	1		0	0	
	7040		.90	.98	55.10	.00	.00	.35	.00	2	2		2	1		0	0	
7040	15		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	6140		.90	.98	55.10	.00	.00	.35	.00	2	2		4	1		0	0	
	7060		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		3	1		0	0	
	8040		1.00	1.09	55.05	.00	.00	.38	.00	2	2		2	1		0	0	
7060	16		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		1	1		0	0	
	7070		1.00	1.50	40.00	.00	.00	.56	.00	1	2		3	1		0	0	
7070	17		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5070		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		4	1		0	0	TRNVOL
	7060		1.00	1.50	40.00	.00	.00	.56	.00	1	2		1	1		0	0	TRNVOL
	7090		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		3	1		0	0	TRNVOL
	8070		1.00	1.50	40.00	.00	.00	.56	.00	1	2		2	1		0	0	TRNVOL
7090	18		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		2.00	3.00	40.00	.00	.00	1.12	.00	1	2		1	1		0	0	
8020	19		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5020		3.30	3.30	60.00	.00	.00	1.33	.00	3	3		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.56	.00	1	1		3	1		0	0	
	9020		1.00	1.00	60.00	.00	.00	.40	.00	3	3		2	1		0	0	

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REPORT OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCK COST
****
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PAGE NO. 4
DATE 30JUN91
TIME 22:09:46

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
8030	20		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5030		3.00	4.50	40.00	.00	.00	1.68	.00	1	2		4	1		0	0	TRNVOL
	8020		1.00	1.50	40.00	.00	.00	.56	.00	1	1		1	1		0	0	TRNVOL
	8040		1.00	1.50	40.00	.00	.00	.56	.00	1	1		3	1		0	0	TRNVOL
	9030		1.00	1.50	40.00	.00	.00	.56	.00	1	2		2	1		0	0	TRNVOL
8040	21		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		1.00	1.09	55.05	.00	.00	.38	.00	2	2		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.56	.00	1	1		1	1		0	0	
	8070		3.00	3.27	55.05	.00	.00	1.15	.00	2	2		3	1		0	0	
8070	22		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		1.00	1.50	40.00	.00	.00	.56	.00	1	2		4	1		0	0	
	8040		3.00	3.27	55.05	.00	.00	1.15	.00	2	2		1	1		0	0	
	8090		2.00	2.18	55.05	.00	.00	.77	.00	2	2		3	1		0	0	
8090	23		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8070		2.00	2.18	55.05	.00	.00	.77	.00	2	2		1	1		0	0	
9020	24		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8020		1.00	1.00	60.00	.00	.00	.40	.00	3	3		4	1		0	0	
9030	25		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8030		1.00	1.50	40.00	.00	.00	.56	.00	1	2		4	1		0	0	

```
$REPORT HIGHWAY NETWORK
$FILE
   INPUT FILE = HWYNET, USER ID = $SN91FMB.CST$
$HEADERS
           REPORT OF OUR SMALL HIGHWAY NETWORK W/BEET TRUCK COST
                 ***********************************
                      copyrighted BY pfi, 1990
$OPTION
   PRINT COORDINATES
   DETAIL
$PARAMETERS
   IMPEDANCE = TIME 1
$END TP FUNCTIONS
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.10                   COPYRIGHTED BY PROGRAMMING FOR IMBECILES 1990                    TIME  22:09:54

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FMB.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:24                                         CURRENT TIME ---------- 22:09:54

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   116
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX             XXXXXXXX   XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX           XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX   XX         XXXXXXXXXX   XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX   XX         XX      XX   XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX   XX         XX      XX   XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX   XX         XX      XX   XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX    XX         XXXXXXXXXX   XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX           XX         XXXXXXXXXX   XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX           XX         XX      XX   XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX           XXXXXXXXXX XX      XX   XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX           XXXXXXXXXX XX      XX   XX      XX
```

```
*******************************************************************************
*                                                                             *
*                            HIGHWAY NETWORK REPORTS                          *
*                                                                             *
*            REPORT OF OUR SMALL HIGHWAY NETWORK W/BEET TRUCK COST            *
*                  ***********************************                        *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FMB.CST

FILE HEADER ---------- A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
****
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ---------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:09:24 CURRENT TIME ---------- 22:09:54

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 116

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REPORT OF OUR SMALL HIGHWAY NETWORK W/BEET TRUCK COST
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NODE COORDINATES

NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD	NODE	X-COORD	Y-COORD
1	100	200	2	100	300	3	300	200	4	300	300	5	300	700
6	300	800	7	400	300	8	400	400	9	400	700	10	500	200
11	500	300	12	500	400	13	500	700	14	500	900	15	700	400
16	700	600	17	700	700	18	700	900	19	800	200	20	800	300
21	800	400	22	800	700	23	800	900	24	900	200	25	900	300
1020	100	200	1030	100	300	3020	300	200	3030	300	300	3070	300	700
3080	300	800	4030	400	300	4040	400	400	4070	400	700	5020	500	200
5030	500	300	5040	500	400	5070	500	700	5090	500	900	5940	590	400
6140	610	400	7040	700	400	7060	700	600	7070	700	700	7090	700	900
8020	800	200	8030	800	300	8040	800	400	8070	800	700	8090	800	900
9020	900	200	9030	900	300									

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REPORT OF OUR SMALL HIGHWAY NETWORK W/BEET TRUCK COST
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NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME
1	1020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
2	1030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
3	3020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
4	3030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
5	3070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
6	3080		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
7	4030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
8	4040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
9	4070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
10	5020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
11	5030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
12	5040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
13	5070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
14	5090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
15	7040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
16	7060		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
17	7070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
18	7090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
19	8020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
20	8030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
21	8040		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
22	8070		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
23	8090		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
24	9020		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0
25	9030		.00	.00	.00	.00	.00	.00	.00	0	0		5	0		0	0

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REPORT OF OUR SMALL HIGHWAY NETWORK W/BEET TRUCK COST
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NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
1020	1		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		2	1		0	0	
1030	2		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		2.00	2.00	60.00	.00	.00	1.12	.00	3	2		2	1		0	0	
3020	3		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	1020		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		4	1		0	0	
	3030		1.00	1.50	40.00	.00	.00	.80	.00	1	1		3	1		0	0	
	5020		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		2	1		0	0	
3030	4		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	1030		2.00	2.00	60.00	.00	.00	1.12	.00	3	2		4	1		0	0	TRNVOL
	3020		1.00	1.50	40.00	.00	.00	.80	.00	1	1		1	1		0	0	TRNVOL
	3070		4.00	6.00	40.00	.00	.00	3.21	.00	1	2		3	1		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.56	.00	3	2		2	1		0	0	TRNVOL
3070	5		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		4.00	6.00	40.00	.00	.00	3.21	.00	1	2		1	1		0	0	
	3080		1.00	1.50	40.00	.00	.00	.80	.00	1	1		3	1		0	0	
	4070		1.00	1.50	40.00	.00	.00	.80	.00	1	1		2	1		0	0	
3080	6		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.80	.00	1	1		1	1		0	0	
4030	7		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3030		1.00	1.00	60.00	.00	.00	.56	.00	3	2		4	1		0	0	
	4040		1.00	1.50	40.00	.00	.00	.80	.00	1	2		3	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.56	.00	3	2		2	1		0	0	
4040	8		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	4030		1.00	1.50	40.00	.00	.00	.80	.00	1	2		1	1		0	0	
	4070		3.00	4.50	40.00	.00	.00	2.41	.00	1	2		3	1		0	0	
	5040		1.00	1.50	40.00	.00	.00	.80	.00	1	1		2	1		0	0	
4070	9		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3070		1.00	1.50	40.00	.00	.00	.80	.00	1	1		4	1		0	0	
	4040		3.00	4.50	40.00	.00	.00	2.41	.00	1	2		1	1		0	0	
	5070		1.00	1.09	55.05	.00	.00	.54	.00	2	2		2	1		0	0	
5020	10		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	3020		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		4	1		0	0	
	5030		1.00	1.00	60.00	.00	.00	.56	.00	3	3		3	1		0	0	
	8020		3.30	3.30	60.00	.00	.00	1.85	.00	3	3		2	1		0	0	

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REPORT OF OUR SMALL HIGHWAY NETWORK W/BEET TRUCK COST
****
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PAGE NO. 3
DATE 30JUN91
TIME 22:09:54

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
5030	11		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4030		1.00	1.00	60.00	.00	.00	.56	.00	3	2		4	1		0	0	TRNVOL
	5020		1.00	1.00	60.00	.00	.00	.56	.00	3	3		1	1		0	0	TRNVOL
	5040		1.00	1.00	60.00	.00	.00	.56	.00	3	3		3	1		0	0	TRNVOL
	8030		3.00	4.50	40.00	.00	.00	2.41	.00	1	2		2	1		0	0	TRNVOL
5040	12		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4040		1.00	1.50	40.00	.00	.00	.80	.00	1	1		4	1		0	0	TRNVOL
	5030		1.00	1.00	60.00	.00	.00	.56	.00	3	3		1	1		0	0	TRNVOL
	5070		3.00	3.00	60.00	.00	.00	1.69	.00	3	3		3	1		0	0	TRNVOL
	5940		.90	.98	55.10	.00	.00	.48	.00	2	2		2	1		0	0	TRNVOL
5070	13		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	4070		1.00	1.09	55.05	.00	.00	.54	.00	2	2		4	1		0	0	TRNVOL
	5040		3.00	3.00	60.00	.00	.00	1.69	.00	3	3		1	1		0	0	TRNVOL
	5090		2.00	2.00	60.00	.00	.00	1.12	.00	3	3		3	1		0	0	TRNVOL
	7070		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		2	1		0	0	TRNVOL
5090	14		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5070		2.00	2.00	60.00	.00	.00	1.12	.00	3	3		1	1		0	0	
5940	5040		.90	.98	55.10	.00	.00	.48	.00	2	2		4	1		0	0	
6140	7040		.90	.98	55.10	.00	.00	.48	.00	2	2		2	1		0	0	
7040	15		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	6140		.90	.98	55.10	.00	.00	.48	.00	2	2		4	1		0	0	
	7060		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		3	1		0	0	
	8040		1.00	1.09	55.05	.00	.00	.54	.00	2	2		2	1		0	0	
7060	16		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		1	1		0	0	
	7070		1.00	1.50	40.00	.00	.00	.80	.00	1	2		3	1		0	0	
7070	17		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5070		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		4	1		0	0	TRNVOL
	7060		1.00	1.50	40.00	.00	.00	.80	.00	1	2		1	1		0	0	TRNVOL
	7090		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		3	1		0	0	TRNVOL
	8070		1.00	1.50	40.00	.00	.00	.80	.00	1	2		2	1		0	0	TRNVOL
7090	18		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		2.00	3.00	40.00	.00	.00	1.61	.00	1	2		1	1		0	0	
8020	19		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	5020		3.30	3.30	60.00	.00	.00	1.85	.00	3	3		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.80	.00	1	1		3	1		0	0	
	9020		1.00	1.00	60.00	.00	.00	.56	.00	3	3		2	1		0	0	

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.10

REPORT OF OUR SMALL HIGHWAY NETWORK W/BEET TRUCK COST
****
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PAGE NO. 4
DATE 30JUN91
TIME 22:09:54

NETWORK DESCRIPTION REPORT

ANODE	BNODE	1 WAY	DIST	TIME1	SPEED1	TIME2	SPEED2	COST	USER	LINK GROUPS L1	L2	L3	DIR	A/G	PNODE	CAPACITY	VOLUME	
8030	20		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	TRNVOL
	5030		3.00	4.50	40.00	.00	.00	2.41	.00	1	2		4	1		0	0	TRNVOL
	8020		1.00	1.50	40.00	.00	.00	.80	.00	1	1		1	1		0	0	TRNVOL
	8040		1.00	1.50	40.00	.00	.00	.80	.00	1	1		3	1		0	0	TRNVOL
	9030		1.00	1.50	40.00	.00	.00	.80	.00	1	2		2	1		0	0	TRNVOL
8040	21		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7040		1.00	1.09	55.05	.00	.00	.54	.00	2	2		4	1		0	0	
	8030		1.00	1.50	40.00	.00	.00	.80	.00	1	1		1	1		0	0	
	8070		3.00	3.27	55.05	.00	.00	1.61	.00	2	2		3	1		0	0	
8070	22		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	7070		1.00	1.50	40.00	.00	.00	.80	.00	1	2		4	1		0	0	
	8040		3.00	3.27	55.05	.00	.00	1.61	.00	2	2		1	1		0	0	
	8090		2.00	2.18	55.05	.00	.00	1.07	.00	2	2		3	1		0	0	
8090	23		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8070		2.00	2.18	55.05	.00	.00	1.07	.00	2	2		1	1		0	0	
9020	24		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8020		1.00	1.00	60.00	.00	.00	.56	.00	3	3		4	1		0	0	
9030	25		.00	.00	.00	.00	.00	.00	.00	0	0		11	0		0	0	
	8030		1.00	1.50	40.00	.00	.00	.80	.00	1	2		4	1		0	0	

```
$HIGHWAY SELECTED SUMMATION
  INPUT FILE = HWYNET, USER ID = $sn91car.cst$
  OUTPUT FILE = HWYSKIM, USER ID = $sn91car.SKM$
$HEADERS
          REPORT OF HIGHWAY SELECTED SUMMATION FOR CARS
$PARAMETERS
  IMPEDANCE = TIME 1
$DATA
  TABLE = TIME 1
  TABLE = COST
  TABLE = DISTANCE
$END TP FUNCTION
```

Builds minimum paths with time1 in the network and skimmed cost and distance along those minimum paths. See TRANPLAN section PATH 1-1 to 1-5. Done for the four vehicle types.

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ********************************************                     DATE   30JUN91
  VERSION 6.20                           COPYRIGHTED BY PFI, 1990                                  TIME  22:10:02


INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91CAR.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ********************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:04                                         CURRENT TIME ---------- 22:10:02

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
$HIGHWAY SELECTED SUMMATION
  INPUT FILE = HWYNET, USER ID = $sn91FB.cst$
  OUTPUT FILE = HWYSKIM, USER ID = $sn91FB.SKM$
$HEADERS
           REPORT OF HIGHWAY SELECTED SUMMATION FOR PICKUPS
$PARAMETERS
  IMPEDANCE = TIME 1
$DATA
  TABLE = TIME 1
  TABLE = COST
  TABLE = DISTANCE
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ********************************************                     DATE   30JUN91
  VERSION 6.20                           COPYRIGHTED BY PFI, 1990                                  TIME  22:10:09


INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FB.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ********************************************
                                                   COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:11                                         CURRENT TIME ---------- 22:10:09

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
$HIGHWAY SELECTED SUMMATION
  INPUT FILE = HWYNET, USER ID = $sn91FMG.cst$
  OUTPUT FILE = HWYSKIM, USER ID = $sn91FMG.SKM$
$HEADERS
          REPORT OF HIGHWAY SELECTED SUMMATION FOR FARM TRUCKS
$PARAMETERS
  IMPEDANCE = TIME 1
$DATA
  TABLE = TIME 1
  TABLE = COST
  TABLE = DISTANCE
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.20                           COPYRIGHTED BY PFI, 1990                                 TIME  22:10:17

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FMG.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:17                                         CURRENT TIME ---------- 22:10:17

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                            MAXIMUM NODE NO.  =  9030

                            NUMBER OF LINKS   =   118
```

```
$HIGHWAY SELECTED SUMMATION
  INPUT FILE = HWYNET, USER ID = $sn91FMB.cst$
  OUTPUT FILE = HWYSKIM, USER ID = $sn91FMB.SKM$
$HEADERS
           REPORT OF HIGHWAY SELECTED SUMMATION FOR HEAVY TRUCKS
$PARAMETERS
  IMPEDANCE = TIME 1
$DATA
  TABLE = TIME 1
  TABLE = COST
  TABLE = DISTANCE
$END TP FUNCTION
```

```
   DCCO / UAG                    A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                    PAGE NO.     1
TRANPLAN SYSTEM                  ***********************************************                  DATE   30JUN91
  VERSION 6.20                   COPYRIGHTED BY PROGRAMMING FOR IMBECILES 1990                    TIME  22:10:25


INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FMB.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          ***********************************************
                                          COPYRIGHTED BY PROGRAMMING FOR IMBECILES 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:24                                         CURRENT TIME ---------- 22:10:25

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   116
```

```
$REPORT MATRIX
$FILE
   INPUT FILE = RTABIN, USER ID = $SN91CAR.SKM$
$HEADERS
            SKIM TABLE REPORT OF OUR SMALL NETWORK FOR CARS
                 ***********************************
                      copyrighted BY pfi, 1990
$OPTIONS
  PRINT TABLE
$PARAMETERS
  SELECTED IMPEDANCES = COST, DISTANCE, TIME 1
$END TP FUNCTION
```

Report Matrix gives skim values for cost, distance and time1 for each of the four vehicle type. May also be done by link groups.

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT OF HIGHWAY SELECTED SUMMATION FOR CARS

PAGE NO. 1
DATE 30JUN91
TIME 22:10:32

INPUT FILE NAME ---------- RTABIN

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91CAR.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR CARS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91

CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:02

CURRENT TIME ---------- 22:10:32

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX    XX      XX   XXXXXXXXX    XX            XXXXXXXX    XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX   XX           XXXXXXXXXX   XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX   XX           XX      XX   XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX   XX           XX      XX   XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX   XX           XX      XX   XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX    XX           XXXXXXXXXX   XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX           XX           XXXXXXXXXX   XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX           XX           XX      XX   XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX           XXXXXXXXXX   XX      XX   XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX           XXXXXXXXXX   XX      XX   XX      XX
```

```
*******************************************************************************
*                                                                             *
*                              MATRIX REPORTS                                 *
*                                                                             *
*            SKIM TABLE REPORT OF OUR SMALL NETWORK FOR CARS                  *
*                 ***********************************                         *
*                      COPYRIGHTED BY PFI, 1990                               *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91CAR.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR CARS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:02 CURRENT TIME ---------- 22:10:32

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

SKIM TABLE REPORT OF OUR SMALL NETWORK FOR CARS
****
COPYRIGHTED BY PFI, 1990

PAGE NO. 1
DATE 30JUN91
TIME 22:10:32

ORIGIN ZONE 1 SKIM VALUE COST

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	1.28	0.57	0.85	1.98	2.26	1.06	1.34	2.19	1.14	10
11	1.27	1.48	2.12	2.55	1.88	2.45	2.69	3.26	1.84	2.12	20
21	2.08	2.69	3.10	2.05	2.40						

ORIGIN ZONE 1 SKIM VALUE DISTANCE

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	5.00	2.00	3.00	7.00	8.00	4.00	5.00	8.00	4.00	10
11	5.00	6.00	9.00	11.00	8.00	10.00	11.00	13.00	7.30	8.30	20
21	9.00	12.00	14.00	8.30	9.30						

ORIGIN ZONE 1 SKIM VALUE TIME 1

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	6.50	3.00	4.50	10.50	12.00	5.50	7.00	11.50	6.00	10
11	6.50	7.50	10.50	12.50	9.68	12.68	13.50	16.50	9.30	10.80	20
21	10.77	14.04	16.22	10.30	12.30						

```
$REPORT MATRIX
$FILE
   INPUT FILE = RTABIN, USER ID = $SN91FB.SKM$
$HEADERS
            SKIM TABLE REPORT OF OUR SMALL NETWORK FOR PICKUPS
                 **********************************
                      copyrighted BY pfi, 1990
$OPTIONS
  PRINT TABLE
$PARAMETERS
  SELECTED IMPEDANCES = COST, DISTANCE, TIME 1
$END TP FUNCTION
```

DCCO / UAG REPORT OF HIGHWAY SELECTED SUMMATION FOR PICKUPS PAGE NO.

TRANPLAN SYSTEM
VERSION 6.20

DATE 30JUN91
TIME 22:10:37

INPUT FILE NAME ---------- RTABIN

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FB.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR PICKUPS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:09 CURRENT TIME ---------- 22:10:37

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX             XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX    XX      XX   XXXXXXXXX    XX            XXXXXXXX    XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX   XX           XXXXXXXXXX   XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX   XX           XX      XX   XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX   XX           XX      XX   XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX   XX           XX      XX   XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX    XX           XXXXXXXXXX   XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX           XX           XXXXXXXXXX   XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX           XX           XX      XX   XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX           XXXXXXXXXX   XX      XX   XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX           XXXXXXXXXX   XX      XX   XX      XX
```

```
*******************************************************************************
*                                                                             *
*                              MATRIX REPORTS                                 *
*                                                                             *
*            SKIM TABLE REPORT OF OUR SMALL NETWORK FOR PICKUPS               *
*                 ***********************************                         *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FB.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR PICKUPS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:09 CURRENT TIME ---------- 22:10:37

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

SKIM TABLE REPORT OF OUR SMALL NETWORK FOR PICKUPS
****
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PAGE NO. 1
DATE 30JUN91
TIME 22:10:37

ORIGIN ZONE 1 SKIM VALUE COST

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	1.53	0.68	1.02	2.37	2.71	1.28	1.62	2.63	1.36	10
11	1.54	1.80	2.57	3.08	2.29	2.97	3.25	3.93	2.20	2.54	20
21	2.53	3.26	3.75	2.46	2.88						

ORIGIN ZONE 1 SKIM VALUE DISTANCE

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	5.00	2.00	3.00	7.00	8.00	4.00	5.00	8.00	4.00	10
11	5.00	6.00	9.00	11.00	8.00	10.00	11.00	13.00	7.30	8.30	20
21	9.00	12.00	14.00	8.30	9.30						

ORIGIN ZONE 1 SKIM VALUE TIME 1

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	6.50	3.00	4.50	10.50	12.00	5.50	7.00	11.50	6.00	10
11	6.50	7.50	10.50	12.50	9.68	12.68	13.50	16.50	9.30	10.80	20
21	10.77	14.04	16.22	10.30	12.30						

```
$REPORT MATRIX
$FILE
   INPUT FILE = RTABIN, USER ID = $SN91FMG.SKM$
$HEADERS
         SKIM TABLE REPORT OF OUR SMALL NETWORK FOR FARM TRUCKS
                 ***********************************
                      copyrighted BY pfi, 1990
$OPTIONS
  PRINT TABLE
$PARAMETERS
  SELECTED IMPEDANCES = COST, DISTANCE, TIME 1
$END TP FUNCTION
```

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT OF HIGHWAY SELECTED SUMMATION FOR FARM TRUCKS

PAGE NO. 1
DATE 30JUN91
TIME 22:10:42

INPUT FILE NAME ---------- RTABIN

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FMG.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR FARM TRUCKS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91

CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:17

CURRENT TIME ---------- 22:10:42

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX            XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX  XX           XXXXXXXXXX  XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX  XX           XX      XX  XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX  XX           XX      XX  XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX  XX           XX      XX  XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX   XX           XXXXXXXXXX  XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX          XX           XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX          XX           XX      XX  XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX          XXXXXXXXXX   XX      XX  XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX          XXXXXXXXXX   XX      XX  XX      XX
```

```
*****************************************************************************************
*                                                                                       *
*                                    MATRIX REPORTS                                     *
*                                                                                       *
*            SKIM TABLE REPORT OF OUR SMALL NETWORK FOR FARM TRUCKS                     *
*                   ***********************************                                 *
*                        COPYRIGHTED BY PFI, 1990                                       *
*                                                                                       *
*****************************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FMG.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR FARM TRUCKS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:17 CURRENT TIME ---------- 22:10:42

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

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TRANPLAN SYSTEM
VERSION 6.20

SKIM TABLE REPORT OF OUR SMALL NETWORK FOR FARM TRUCKS
****
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PAGE NO. 1
DATE 30JUN91
TIME 22:10:42

ORIGIN ZONE 1 SKIM VALUE COST

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	2.49	1.12	1.68	3.92	4.48	2.08	2.64	4.32	2.24	10
11	2.48	2.88	4.09	4.90	3.66	4.78	5.21	6.33	3.57	4.13	20
21	4.04	5.19	5.96	3.97	4.69						

ORIGIN ZONE 1 SKIM VALUE DISTANCE

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	5.00	2.00	3.00	7.00	8.00	4.00	5.00	8.00	4.00	10
11	5.00	6.00	9.00	11.00	8.00	10.00	11.00	13.00	7.30	8.30	20
21	9.00	12.00	14.00	8.30	9.30						

ORIGIN ZONE 1 SKIM VALUE TIME 1

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	6.50	3.00	4.50	10.50	12.00	5.50	7.00	11.50	6.00	10
11	6.50	7.50	10.50	12.50	9.68	12.68	13.50	16.50	9.30	10.80	20
21	10.77	14.04	16.22	10.30	12.30						

```
$REPORT MATRIX
$FILE
   INPUT FILE = RTABIN, USER ID = $SN91FMB.SKM$
$HEADERS
         SKIM TABLE REPORT OF OUR SMALL NETWORK FOR HEAVY TRUCKS
                 **********************************
                      copyrighted BY pfi, 1990
$OPTIONS
  PRINT TABLE
$PARAMETERS
  SELECTED IMPEDANCES = COST, DISTANCE, TIME 1
$END TP FUNCTION
```

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TRANPLAN SYSTEM
VERSION 6.20

REPORT OF HIGHWAY SELECTED SUMMATION FOR HEAVY TRUCKS

PAGE NO. 1
DATE 30JUN91
TIME 22:10:47

INPUT FILE NAME ---------- RTABIN

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FMB.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR HEAVY TRUCKS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91

CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:25

CURRENT TIME ---------- 22:10:47

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX            XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX  XX           XXXXXXXXXX  XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX  XX           XX      XX  XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX  XX           XX      XX  XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX  XX           XX      XX  XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX   XX           XXXXXXXXXX  XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX          XX           XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX          XX           XX      XX  XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX          XXXXXXXXXX   XX      XX  XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX          XXXXXXXXXX   XX      XX  XX      XX
```

```
*******************************************************************************
*                                                                             *
*                              MATRIX REPORTS                                 *
*                                                                             *
*          SKIM TABLE REPORT OF OUR SMALL NETWORK FOR HEAVY TRUCKS            *
*                  ***********************************                        *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - SN91FMB.SKM

FILE HEADER ---------- REPORT OF HIGHWAY SELECTED SUMMATION FOR HEAVY TRUCKS

GENERATING FUNCTION ------ HIGHWAY SELECTED SUMMATION

TYPE OF FILE ---------- HWYSKIM

GENERATION FILE NAME ----- HWYSKIM

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:10:25 CURRENT TIME ---------- 22:10:48

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM TABLE NO. = 3

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TRANPLAN SYSTEM
VERSION 6.20

SKIM TABLE REPORT OF OUR SMALL NETWORK FOR HEAVY TRUCKS
****
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ORIGIN ZONE 1 SKIM VALUE COST

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	3.53	1.61	2.41	5.62	6.42	2.97	3.77	6.18	3.22	10
11	3.53	4.09	5.78	6.90	7.21	8.19	7.39	9.00	5.07	5.87	20
21	6.67	8.19	9.26	5.63	6.67						

ORIGIN ZONE 1 SKIM VALUE DISTANCE

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	5.00	2.00	3.00	7.00	8.00	4.00	5.00	8.00	4.00	10
11	5.00	6.00	9.00	11.00	10.30	12.00	11.00	13.00	7.30	8.30	20
21	9.30	12.00	14.00	8.30	9.30						

ORIGIN ZONE 1 SKIM VALUE TIME 1

TO ZONE	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-	-9-	-0-	TO ZONE
1	0.00	6.50	3.00	4.50	10.50	12.00	5.50	7.00	11.50	6.00	10
11	6.50	7.50	10.50	12.50	13.39	15.00	13.50	16.50	9.30	10.80	20
21	12.30	15.00	17.18	10.30	12.30						

SRVDATA FILES CODING (See General Description section 3-5)
Trip files produced outside of TRANPLAN
Total Trips in Trip Factor Field

NODES

NUMBER OF TRIPS

GENERAL PURPOSE CODE
C 17-19

1 = PERSONAL
2 = FARM BUSINESS
3 = FARM MARKETING - GRAIN
4 = FARM MARKETING - SB/P

MODE OF TRAVEL CODE
C 30-32

1 = CAR
2 = PICKUP TRUCK
3 = FARM TRUCK
4 = SEMI / HEAVY TRUCK

PERSONAL

0001 0002	1	1	10
0001 0012	1	1	10
0002 0012	1	1	50
0003 0002	1	1	10
0003 0012	1	1	10
0004 0002	1	1	10
0004 0012	1	1	10
0005 0002	1	1	10
0005 0014	1	1	10
0006 0002	1	1	10
0006 0014	1	1	10
0007 0002	1	1	10
0007 0012	1	1	10
0008 0002	1	1	10
0008 0012	1	1	10
0010 0002	1	1	10
0010 0012	1	1	10
0011 0002	1	1	10
0011 0012	1	1	10
0012 0002	1	1	30
0013 0002	1	1	10
0013 0014	1	1	10
0014 0002	1	1	30
0015 0002	1	1	10
0015 0025	1	1	10
0016 0002	1	1	10
0016 0014	1	1	10
0017 0002	1	1	10
0017 0014	1	1	10
0018 0002	1	1	10
0018 0014	1	1	10
0019 0002	1	1	10
0019 0025	1	1	10
0020 0002	1	1	10
0020 0025	1	1	10
0021 0002	1	1	10
0021 0025	1	1	10
0022 0002	1	1	10
0022 0014	1	1	10
0023 0002	1	1	10
0023 0014	1	1	10
0024 0002	1	1	10
0024 0025	1	1	10
0025 0002	1	1	20

FARM BUSINESS

0001 0002	2	2	2
0001 0012	2	2	2
0002 0012	2	2	7
0003 0002	2	2	2
0003 0012	2	2	2
0004 0002	2	2	2
0004 0012	2	2	2
0005 0002	2	2	2
0005 0014	2	2	2
0006 0002	2	2	2
0006 0014	2	2	2
0007 0002	2	2	2
0007 0012	2	2	2
0008 0002	2	2	2
0008 0012	2	2	2
0010 0002	2	2	2
0010 0012	2	2	2
0011 0002	2	2	2
0011 0012	2	2	2
0012 0002	2	2	5
0013 0002	2	2	2
0013 0014	2	2	2
0014 0002	2	2	5
0015 0002	2	2	2
0015 0025	2	2	2
0016 0002	2	2	2
0016 0014	2	2	2
0017 0002	2	2	2
0017 0014	2	2	2
0018 0002	2	2	2
0018 0014	2	2	2
0019 0002	2	2	2
0019 0025	2	2	2
0020 0002	2	2	2
0020 0025	2	2	2
0021 0002	2	2	2
0021 0025	2	2	2
0022 0002	2	2	2
0022 0014	2	2	2
0023 0002	2	2	2
0023 0014	2	2	2
0024 0002	2	2	2
0024 0025	2	2	2
0025 0002	2	2	4

FARM MARKETING GRAIN

0001	0002	3	3	2
0003	0002	3	3	2
0004	0002	3	3	6
0005	0014	3	3	4
0006	0014	3	3	2
0007	0002	3	3	2
0007	0012	3	3	2
0008	0002	3	3	2
0008	0012	3	3	2
0009	0014	3	3	2
0010	0012	3	3	2
0010	0025	3	3	2
0011	0002	3	3	2
0011	0012	3	3	2
0013	0014	3	3	2
0015	0012	3	3	2
0015	0025	3	3	2
0016	0012	3	3	2
0016	0014	3	3	2
0017	0014	3	3	2
0018	0014	3	3	2
0019	0012	3	3	2
0019	0025	3	3	2
0020	0012	3	3	2
0020	0025	3	3	2
0021	0012	3	3	2
0021	0025	3	3	2
0022	0014	3	3	2
0023	0014	3	3	2
[illegible]23	0025	3	3	2
[illegible]24	0012	3	3	2
0024	0025	3	3	2

FARM MARKETING BEETS

0001	0002	3	4	2
0003	0002	3	4	2
0004	0002	3	4	2
0005	0009	3	4	2
0005	0012	3	4	2
0006	0009	3	4	2
0006	0012	3	4	2
0007	0002	3	4	4
0009	0002	3	4	14
0010	0012	3	4	2
0011	0012	3	4	2
0013	0009	3	4	2
0013	0012	3	4	4
0015	0012	3	4	2
0017	0009	3	4	2
0018	0009	3	4	2
0018	0012	3	4	4
0019	0012	3	4	2
0021	0012	3	4	2
0022	0009	3	4	2
0023	0002	3	4	3
0023	0009	3	4	2
0024	0012	3	4	2

```
$BUILD TRIP TABLE
$FILE
     INPUT FILE = SRVDATA, USER ID = $SRVDATA.PER$
     OUTPUT FILE = VOLUME, USER ID = $PER.VOL$
$HEADERS
       BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/CAR COST
                 **********************************
                       copyrighted BY pfi, 1990
$OPTIONS
     PRINT TRIP ENDS
$PARAMETERS
     NUMBER OF ZONES = 25
$DATA
     TABLE 1, ALL
$END TP FUNCTION

NUMBER OF RECORDS PROCESSED =     44
```

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/CAR COST
****
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TRIP END SUMMARY --- PURPOSE 1

ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS	ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS
1	20	0	20	0					
2	50	280	330	0					
3	20	0	20	0					
4	20	0	20	0					
5	20	0	20	0					
6	20	0	20	0					
7	20	0	20	0					
8	20	0	20	0					
9	0	0	0	0					
10	20	0	20	0					
11	20	0	20	0					
12	30	120	150	0					
13	20	0	20	0					
14	30	80	110	0					
15	20	0	20	0					
16	20	0	20	0					
17	20	0	20	0					
18	20	0	20	0					
19	20	0	20	0					
20	20	0	20	0					
21	20	0	20	0					
22	20	0	20	0					
23	20	0	20	0					
24	20	0	20	0					
25	20	50	70	0					
	---	---	---	---					
TOTALS	530	530	1060	0					

```
$BUILD TRIP TABLE
$FILE
     INPUT FILE = SRVDATA, USER ID = $SRVDATA.FB$
     OUTPUT FILE = VOLUME, USER ID = $FB.VOL$
$HEADERS
       BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/PICKUPS
                 ***********************************
                       copyrighted BY pfi, 1990
$OPTIONS
     PRINT TRIP ENDS
$PARAMETERS
     NUMBER OF ZONES = 25
$DATA
     TABLE 1, ALL
$END TP FUNCTION

NUMBER OF RECORDS PROCESSED =     44
```

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/PICKUPS
****
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TRIP END SUMMARY --- PURPOSE 1

ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS	ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS
1	4	0	4	0					
2	7	54	61	0					
3	4	0	4	0					
4	4	0	4	0					
5	4	0	4	0					
6	4	0	4	0					
7	4	0	4	0					
8	4	0	4	0					
9	0	0	0	0					
10	4	0	4	0					
11	4	0	4	0					
12	5	21	26	0					
13	4	0	4	0					
14	5	16	21	0					
15	4	0	4	0					
16	4	0	4	0					
17	4	0	4	0					
18	4	0	4	0					
19	4	0	4	0					
20	4	0	4	0					
21	4	0	4	0					
22	4	0	4	0					
23	4	0	4	0					
24	4	0	4	0					
25	4	10	14	0					
TOTALS	101	101	202	0					

```
$BUILD TRIP TABLE
$FILE
     INPUT FILE = SRVDATA, USER ID = $SRVDATA.FMG$
     OUTPUT FILE = VOLUME, USER ID = $FMG.VOL$
$HEADERS
       BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCKS
                 ***********************************
                       copyrighted BY pfi, 1990
$OPTIONS
     PRINT TRIP ENDS
$PARAMETERS
     NUMBER OF ZONES = 25
$DATA
     TABLE 1, ALL
$END TP FUNCTION

NUMBER OF RECORDS PROCESSED =     33
```

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCKS
****
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TRIP END SUMMARY --- PURPOSE 1

ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS	ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS
1	2	0	2	0					
2	0	16	16	0					
3	2	0	2	0					
4	6	0	6	0					
5	4	0	4	0					
6	2	0	2	0					
7	4	0	4	0					
8	4	0	4	0					
9	2	0	2	0					
10	4	0	4	0					
11	4	0	4	0					
12	0	20	20	0					
13	2	0	2	0					
14	0	20	20	0					
15	4	0	4	0					
16	4	0	4	0					
17	2	0	2	0					
18	2	0	2	0					
19	4	0	4	0					
20	4	0	4	0					
21	4	0	4	0					
22	2	0	2	0					
23	4	0	4	0					
24	4	0	4	0					
25	0	14	14	0					
TOTALS	70	70	140	0					

```
$BUILD TRIP TABLE
$FILE
     INPUT FILE = SRVDATA, USER ID = $SRVDATA.FMB$
     OUTPUT FILE = VOLUME, USER ID = $FMB.VOL$
$HEADERS
       BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/HEAVY TRUCKS
                 ***********************************
                       copyrighted BY pfi, 1990
$OPTIONS
     PRINT TRIP ENDS
$PARAMETERS
     NUMBER OF ZONES = 25
$DATA
     TABLE 1, ALL
$END TP FUNCTION

NUMBER OF RECORDS PROCESSED =     23
```

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/HEAVY TRUCKS
****
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PAGE NO. 1
DATE 30JUN91
TIME 22:11:11

TRIP END SUMMARY --- PURPOSE 1

ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS	ZONE/DIST	ORIG/PROD	DEST/ATTR	TOTAL	INTRATRIPS
1	2	0	2	0					
2	0	27	27	0					
3	2	0	2	0					
4	2	0	2	0					
5	4	0	4	0					
6	4	0	4	0					
7	4	0	4	0					
8	0	0	0	0					
9	14	14	28	0					
10	2	0	2	0					
11	2	0	2	0					
12	0	24	24	0					
13	6	0	6	0					
14	0	0	0	0					
15	2	0	2	0					
16	0	0	0	0					
17	2	0	2	0					
18	6	0	6	0					
19	2	0	2	0					
20	0	0	0	0					
21	2	0	2	0					
22	2	0	2	0					
23	5	0	5	0					
24	2	0	2	0					
25	0	0	0	0					
TOTALS	65	65	130	0					

```
$LOAD HIGHWAY NETWORK
$FILES
    INPUT FILE = HWYNET, USER ID =  $SN91CAR.CST$
    INPUT FILE = HWYTRIP, USER ID = $PER.VOL$
    OUTPUT FILE = LODHIST, USER ID =  $LODHIST.PER$
$HEADERS
       REPORT ON LOADING CAR NETWORK W/COST AND CAR TRIPS
             ***********************************
$OPTIONS
    THROUGH CENTROIDS
$PARAMETERS
    IMPEDANCE = TIME 1
$END TP FUNCTION
```

Trips are loaded on a all or nothing bases on the minimum paths. This is done for each vehicle type.

```
   DCCO / UAG                 BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/CAR COST                    PAGE NO.     1
TRANPLAN SYSTEM                          ************************************                            DATE   30JUN91
  VERSION 6.20                                 COPYRIGHTED BY PFI, 1990                                   TIME  22:11:17


INPUT FILE NAME ---------- HWYTRIP

   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - PER.VOL

FILE HEADER -------------        BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/CAR COST
                                            ************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD TRIP TABLE

TYPE OF FILE ------------- VOLUME

GENERATION FILE NAME ----- VOLUME

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:10:53                                                   CURRENT TIME ---------- 22:11:17

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM TABLE NO. =     1


INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - SN91CAR.CST

FILE HEADER -------------                 A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          **********************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:04                                                   CURRENT TIME ---------- 22:11:17

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
$LOAD HIGHWAY NETWORK
$FILES
    INPUT FILE = HWYNET, USER ID =  $SN91FB.CST$
    INPUT FILE = HWYTRIP, USER ID = $FB.VOL$
    OUTPUT FILE = LODHIST, USER ID =  $LODHIST.FB$
$HEADERS
       REPORT ON LOADING PICKUP NETWORK W/COST AND PICKUP TRIPS
                    ************************************
$OPTIONS
    THROUGH CENTROIDS
$PARAMETERS
    IMPEDANCE = TIME 1
$END TP FUNCTION
```

```
   DCCO / UAG                 BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/PICKUPS                          PAGE NO.     1
TRANPLAN SYSTEM                          ************************************                                  DATE   30JUN91
  VERSION 6.20                                 COPYRIGHTED BY PFI, 1990                                        TIME  22:11:28


INPUT FILE NAME ---------- HWYTRIP

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - FB.VOL

FILE HEADER --------------        BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/PICKUPS
                                            ************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD TRIP TABLE

TYPE OF FILE ------------- VOLUME

GENERATION FILE NAME ----- VOLUME

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:10:59                                                   CURRENT TIME ---------- 22:11:28

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM TABLE NO. =     1

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FB.CST

FILE HEADER --------------                 A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                           ********************************************
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GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:11                                                   CURRENT TIME ---------- 22:11:28

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
$LOAD HIGHWAY NETWORK
$FILES
    INPUT FILE = HWYNET, USER ID =  $SN91FMG.CST$
    INPUT FILE = HWYTRIP, USER ID = $FMG.VOL$
    OUTPUT FILE = LODHIST, USER ID =  $LODHIST.FMG$
$HEADERS
    REPORT ON LOADING FARM TRUCK NETWORK W/COST AND FARM TRUCK TRIPS
              ******************************************
$OPTIONS
    THROUGH CENTROIDS
$PARAMETERS
    IMPEDANCE = TIME 1
$END TP FUNCTION
```

```
   DCCO / UAG                 BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCKS                    PAGE NO.     1
 TRANPLAN SYSTEM                          ***********************************                              DATE   30JUN91
   VERSION 6.20                                 COPYRIGHTED BY PFI, 1990                                    TIME  22:11:39

INPUT FILE NAME ---------- HWYTRIP

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - FMG.VOL

FILE HEADER --------------        BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/FARM TRUCKS
                                            ***********************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD TRIP TABLE

TYPE OF FILE ------------- VOLUME

GENERATION FILE NAME ----- VOLUME

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:05                                                   CURRENT TIME ---------- 22:11:39

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM TABLE NO. =     1

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FMG.CST

FILE HEADER --------------                A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                          **********************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:17                                                   CURRENT TIME ---------- 22:11:39

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
$LOAD HIGHWAY NETWORK
$FILES
    INPUT FILE = HWYNET, USER ID =  $SN91FMB.CST$
    INPUT FILE = HWYTRIP, USER ID = $FMB.VOL$
    OUTPUT FILE = LODHIST, USER ID =  $LODHIST.FMB$
$HEADERS
     REPORT ON LOADING HEAVY TRUCK NETWORK W/COST AND HEAVY TRUCK TRIPS
                    ************************************
$OPTIONS
    THROUGH CENTROIDS
$PARAMETERS
    IMPEDANCE = TIME 1
$END TP FUNCTION
```

```
   DCCO / UAG                BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/HEAVY TRUCKS                    PAGE NO.     1
TRANPLAN SYSTEM                          ************************************                               DATE   30JUN91
  VERSION 6.20                                COPYRIGHTED BY PFI, 1990                                      TIME  22:11:50


INPUT FILE NAME ---------- HWYTRIP

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - FMB.VOL

FILE HEADER --------------        BUILD TRIP TABLE OF OUR SMALL HIGHWAY NETWORK W/HEAVY TRUCKS
                                            ************************************
                                                  COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD TRIP TABLE

TYPE OF FILE ------------- VOLUME

GENERATION FILE NAME ----- VOLUME

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:11                                                   CURRENT TIME ---------- 22:11:50

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM TABLE NO. =     1

INPUT FILE NAME ---------- HWYNET

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SN91FMB.CST

FILE HEADER --------------                 A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                           *********************************************
                                           COPYRIGHTED BY PROGRAMMING FOR IMBECILES 1990

GENERATING FUNCTION ------ COST USER HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- CUSOUT

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:09:24                                                   CURRENT TIME ---------- 22:11:50

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   116
```

```
$REPORT HIGHWAY NETWORK SUMMARY
$FILE
    INPUT FILE = LODHIST, USER ID = $LODHIST.PER$
$HEADERS
    REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS
           ******************************
$PARAMETERS
    SELECTED ITERATIONS = 1
$DATA
    TABLE = 1, UNITS = DISTANCE, LINK CODE = LINK GROUP 1,
                                 LINK CODE = ASSIGNMENT GROUP
    TABLE = 2, UNITS = TIME 1, LINK CODE = LINK GROUP 1,
                                 LINK CODE = LINK GROUP 2
    TABLE = 3, UNITS = VEHICLE-DISTANCE, LINK CODE = LINK GROUP 1,
                                 LINK CODE = LINK GROUP 1
    TABLE = 4, UNITS = VEHICLE-HOURS, LINK CODE = LINK GROUP 1,
                                 LINK CODE = LINK GROUP 2
    TABLE = 5, UNITS = VEHICLE-COST, LINK CODE = LINK GROUP 1,
                                 LINK CODE = LINK GROUP 2
$END TP FUNCTION
```

Reports a summary of characteristics by link group or assignment group. Up to three "dimensions" may be used in one table. See TRANPLAN manual REPORTING section 10-1 to 10-8. This is run for each vehicle type.

```
   DCCO / UAG                 REPORT ON LOADING CAR NETWORK W/COST AND CAR TRIPS                          PAGE NO.     1
TRANPLAN SYSTEM              ************************************                                          DATE   30JUN91
  VERSION 6.20                                                                                             TIME  22:12:01


INPUT FILE NAME ---------- LODHIST

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - LODHIST.PER

FILE HEADER --------------        REPORT ON LOADING CAR NETWORK W/COST AND CAR TRIPS
                                     ************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                   CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:17                                                  CURRENT TIME ---------- 22:12:01

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX    XX      XX   XXXXXXXXX    XX            XXXXXXXX    XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX   XX           XXXXXXXXXX   XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX   XX           XX      XX   XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX   XX           XX      XX   XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX   XX           XX      XX   XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX    XX           XXXXXXXXXX   XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX           XX           XXXXXXXXXX   XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX           XX           XX      XX   XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX           XXXXXXXXXX   XX      XX   XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX           XXXXXXXXXX   XX      XX   XX      XX
```

```
*****************************************************************************************
*                                                                                       *
*                          REPORT HIGHWAY NETWORK SUMMARIES                             *
*                                                                                       *
*      REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS                                    *
*             ******************************                                            *
*                                                                                       *
*****************************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.PER

FILE HEADER ---------- REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:17 CURRENT TIME ---------- 22:12:01

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS
****

PAGE NO. 1
DATE 30JUN91
TIME 22:12:01

TABLE NO. 1 --

TABLE UNITS -- MILES

TABLE PAGE NO. 1 OF 1

ASSIGNMENT GROUP >>

LINK GROUP 1 VV	0	1	TOTAL
0	.0	.0	.0
1	.0	60.0	60.0
2	.0	18.0	18.0
3	.0	30.6	30.6
TOTAL	.0	108.6	108.6

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS
****

PAGE NO. 2
DATE 30JUN91
TIME 22:12:01

TABLE NO. 2 --

TABLE UNITS -- HOURS -- TIME 1

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	.3	1.2	.0	1.5
2	.0	.0	.3	.0	.3
3	.0	.0	.1	.4	.5
TOTAL	.0	.3	1.7	.4	2.3

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS
****

PAGE NO. 3
DATE 30JUN91
TIME 22:12:01

TABLE NO. 3 --

TABLE UNITS -- VEHICLE - MILES

TABLE PAGE NO. 1 OF 1

LINK GROUP 1 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	650.0	.0	.0	650.0
2	.0	.0	260.0	.0	260.0
3	.0	.0	.0	2046.0	2046.0
TOTAL	.0	650.0	260.0	2046.0	2956.0

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS
****

PAGE NO. 4
DATE 30JUN91
TIME 22:12:01

TABLE NO. 4 --

TABLE UNITS -- VEHICLE - HOURS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	3.3	13.0	.0	16.3
2	.0	.0	4.7	.0	4.7
3	.0	.0	21.2	12.9	34.1
TOTAL	.0	3.3	38.9	12.9	55.1

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF CAR NETWORK BY LINK CLASS
****

PAGE NO. 5
DATE 30JUN91
TIME 22:12:01

TABLE NO. 5 --

TABLE UNITS -- VEHICLE - DOLLARS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	36.4	147.3	.0	183.7
2	.0	.0	52.4	.0	52.4
3	.0	.0	270.0	164.8	434.8
TOTAL	.0	36.4	469.7	164.8	670.9

```
$REPORT HIGHWAY NETWORK SUMMARY
$FILE
    INPUT FILE = LODHIST, USER ID = $LODHIST.FB$
$HEADERS
    REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS
           ******************************
$PARAMETERS
    SELECTED ITERATIONS = 1
$DATA
    TABLE = 1, UNITS = DISTANCE, LINK CODE = LINK GROUP 1,
                               LINK CODE = ASSIGNMENT GROUP
    TABLE = 2, UNITS = TIME 1, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
    TABLE = 3, UNITS = VEHICLE-DISTANCE, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 1
    TABLE = 4, UNITS = VEHICLE-HOURS, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
    TABLE = 5, UNITS = VEHICLE-COST, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
$END TP FUNCTION
```

```
   DCCO / UAG                 REPORT ON LOADING PICKUP NETWORK W/COST AND PICKUP TRIPS                          PAGE NO.     1
TRANPLAN SYSTEM                          ************************************                                   DATE   30JUN91
  VERSION 6.20                                                                                                   TIME  22:12:10


INPUT FILE NAME ---------- LODHIST


   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - LODHIST.FB

FILE HEADER --------------        REPORT ON LOADING PICKUP NETWORK W/COST AND PICKUP TRIPS
                                            ************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                          CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:28                                                         CURRENT TIME ---------- 22:12:10

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX    XXXXXXXX    XXXXXXXX          XX  XX     XX    XXXXXX     XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX        XX  XX     XX   XXXXXXXX   XXXXXXXXXX
XX      XX   XX      XX  XX      XX       XX   XX     XX   XX      XX  XX      XX
XX      XX   XX          XX      XX      XX    XX     XX   XX      XX  XX
XX      XX   XX          XX      XX     XX     XX     XX   XX      XX  XX
XX      XX   XX          XX      XX    XX      XX     XX   XXXXXXXXXX  XX    XXXX
XX      XX   XX          XX      XX   XX       XX     XX   XX      XX  XX      XX
XX      XX   XX      XX  XX      XX  XX        XX     XX   XX      XX  XX      XX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX XX          XXXXXXXXXX  XX      XX  XXXXXXXXXX
XXXXXXXXX    XXXXXXXX    XXXXXXXX  XX           XXXXXXXX   XX      XX   XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX    XXXXXXXX   XX      XX  XXXXXXXXX   XX          XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX XXX     XX  XXXXXXXXXX  XX         XXXXXXXXXX  XXX     XX
    XX       XX      XX   XX      XX XXXX    XX  XX      XX  XX         XX      XX  XXXX    XX
    XX       XX      XX   XX      XX XX XX   XX  XX      XX  XX         XX      XX  XX XX   XX
    XX       XXXXXXXXXX   XX      XX XX  XX  XX  XXXXXXXXXX  XX         XX      XX  XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX XX  XX  XX  XXXXXXXXX   XX         XXXXXXXXXX  XX  XX  XX
    XX       XX   XX      XXXXXXXXXX XX   XX XX  XX          XX         XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX XX    XXXX  XX          XX         XX      XX  XX    XXXX
    XX       XX     XX    XX      XX XX     XXX  XX          XXXXXXXXXX XX      XX  XX     XXX
    XX       XX      XX   XX      XX XX      XX  XX          XXXXXXXXXX XX      XX  XX      XX
```

```
*****************************************************************************************
*                                                                                       *
*                          REPORT HIGHWAY NETWORK SUMMARIES                             *
*                                                                                       *
*      REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS                                 *
*             ********************************                                          *
*                                                                                       *
*****************************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.FB

FILE HEADER ---------- REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:28 CURRENT TIME ---------- 22:12:10

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS
****

PAGE NO. 1
DATE 30JUN91
TIME 22:12:10

TABLE NO. 1 --

TABLE UNITS -- MILES

TABLE PAGE NO. 1 OF 1

ASSIGNMENT GROUP >>

LINK GROUP 1 VV	0	1	TOTAL
0	.0	.0	.0
1	.0	60.0	60.0
2	.0	18.0	18.0
3	.0	30.6	30.6
TOTAL	.0	108.6	108.6

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS
****

PAGE NO. 2
DATE 30JUN91
TIME 22:12:10

TABLE NO. 2 --

TABLE UNITS -- HOURS -- TIME 1

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	.3	1.2	.0	1.5
2	.0	.0	.3	.0	.3
3	.0	.0	.1	.4	.5
TOTAL	.0	.3	1.7	.4	2.3

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS
****

PAGE NO. 3
DATE 30JUN91
TIME 22:12:10

TABLE NO. 3 --

TABLE UNITS -- VEHICLE - MILES

TABLE PAGE NO. 1 OF 1

LINK GROUP 1 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	130.0	.0	.0	130.0
2	.0	.0	52.0	.0	52.0
3	.0	.0	.0	379.2	379.2
TOTAL	.0	130.0	52.0	379.2	561.2

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS
****

PAGE NO. 4
DATE 30JUN91
TIME 22:12:10

TABLE NO. 4 --

TABLE UNITS -- VEHICLE - HOURS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	.6	2.6	.0	3.3
2	.0	.0	.9	.0	.9
3	.0	.0	3.9	2.4	6.3
TOTAL	.0	.6	7.4	2.4	10.5

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF PICKUP NETWORK BY LINK CLASS
****

PAGE NO. 5
DATE 30JUN91
TIME 22:12:10

TABLE NO. 5 --

TABLE UNITS -- VEHICLE - DOLLARS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	8.8	35.3	.0	44.1
2	.0	.0	12.7	.0	12.7
3	.0	.0	60.2	37.4	97.6
TOTAL	.0	8.8	108.1	37.4	154.3

```
$REPORT HIGHWAY NETWORK SUMMARY
$FILE
    INPUT FILE = LODHIST, USER ID = $LODHIST.FMG$
$HEADERS
    REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS
           ******************************
$PARAMETERS
    SELECTED ITERATIONS = 1
$DATA
    TABLE = 1, UNITS = DISTANCE, LINK CODE = LINK GROUP 1,
                               LINK CODE = ASSIGNMENT GROUP
    TABLE = 2, UNITS = TIME 1, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
    TABLE = 3, UNITS = VEHICLE-DISTANCE, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 1
    TABLE = 4, UNITS = VEHICLE-HOURS, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
    TABLE = 5, UNITS = VEHICLE-COST, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
$END TP FUNCTION
```

```
   DCCO / UAG              REPORT ON LOADING FARM TRUCK NETWORK W/COST AND FARM TRUCK TRIPS                    PAGE NO.     1
TRANPLAN SYSTEM                ********************************************                                   DATE   30JUN91
  VERSION 6.20                                                                                                TIME  22:12:19


INPUT FILE NAME ---------- LODHIST


   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - LODHIST.FMG

FILE HEADER --------------     REPORT ON LOADING FARM TRUCK NETWORK W/COST AND FARM TRUCK TRIPS
                                  ********************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:39                                                   CURRENT TIME ---------- 22:12:19

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX    XX            XXXXXXXX    XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX   XX           XXXXXXXXXX   XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX   XX           XX      XX   XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX   XX           XX      XX   XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX   XX           XX      XX   XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX    XX           XXXXXXXXXX   XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX           XX           XXXXXXXXXX   XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX           XX           XX      XX   XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX           XXXXXXXXXX   XX      XX   XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX           XXXXXXXXXX   XX      XX   XX      XX
```

```
*****************************************************************************************
*                                                                                       *
*                          REPORT HIGHWAY NETWORK SUMMARIES                             *
*                                                                                       *
*      REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS                             *
*             ******************************                                            *
*                                                                                       *
*****************************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.FMG

FILE HEADER ---------- REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:39 CURRENT TIME ---------- 22:12:19

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 1
DATE 30JUN91
TIME 22:12:19

TABLE NO. 1 --

TABLE UNITS -- MILES

TABLE PAGE NO. 1 OF 1

ASSIGNMENT GROUP >>

LINK GROUP 1 VV	0	1	TOTAL
0	.0	.0	.0
1	.0	60.0	60.0
2	.0	18.0	18.0
3	.0	30.6	30.6
TOTAL	.0	108.6	108.6

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 2
DATE 30JUN91
TIME 22:12:19

TABLE NO. 2 --

TABLE UNITS -- HOURS -- TIME 1

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	.3	1.2	.0	1.5
2	.0	.0	.3	.0	.3
3	.0	.0	.1	.4	.5
TOTAL	.0	.3	1.7	.4	2.3

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 3
DATE 30JUN91
TIME 22:12:19

TABLE NO. 3 --

TABLE UNITS -- VEHICLE - MILES

TABLE PAGE NO. 1 OF 1

LINK GROUP 1 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	82.0	.0	.0	82.0
2	.0	.0	44.0	.0	44.0
3	.0	.0	.0	121.8	121.8
TOTAL	.0	82.0	44.0	121.8	247.8

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 4
DATE 30JUN91
TIME 22:12:19

TABLE NO. 4 --

TABLE UNITS -- VEHICLE - HOURS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	.7	1.4	.0	2.0
2	.0	.0	.8	.0	.8
3	.0	.0	.7	1.3	2.0
TOTAL	.0	.7	2.8	1.3	4.9

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF FARM TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 5
DATE 30JUN91
TIME 22:12:19

TABLE NO. 5 --

TABLE UNITS -- VEHICLE - DOLLARS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	15.7	30.2	.0	45.9
2	.0	.0	16.9	.0	16.9
3	.0	.0	17.0	32.2	49.1
TOTAL	.0	15.7	64.1	32.2	112.0

```
$REPORT HIGHWAY NETWORK SUMMARY
$FILE
    INPUT FILE = LODHIST, USER ID = $LODHIST.FMB$
$HEADERS
    REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS
           ******************************
$PARAMETERS
    SELECTED ITERATIONS = 1
$DATA
    TABLE = 1, UNITS = DISTANCE, LINK CODE = LINK GROUP 1,
                               LINK CODE = ASSIGNMENT GROUP
    TABLE = 2, UNITS = TIME 1, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
    TABLE = 3, UNITS = VEHICLE-DISTANCE, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 1
    TABLE = 4, UNITS = VEHICLE-HOURS, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
    TABLE = 5, UNITS = VEHICLE-COST, LINK CODE = LINK GROUP 1,
                               LINK CODE = LINK GROUP 2
$END TP FUNCTION
```

```
   DCCO / UAG                REPORT ON LOADING HEAVY TRUCK NETWORK W/COST AND HEAVY TRUCK TRIPS                PAGE NO.     1
TRANPLAN SYSTEM                          ************************************                                  DATE   30JUN91
  VERSION 6.20                                                                                                  TIME  22:12:28


INPUT FILE NAME ---------- LODHIST


   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - LODHIST.FMB

FILE HEADER --------------      REPORT ON LOADING HEAVY TRUCK NETWORK W/COST AND HEAVY TRUCK TRIPS
                                         ************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:50                                                   CURRENT TIME ---------- 22:12:28

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   116
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX            XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX  XX           XXXXXXXXXX  XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX  XX           XX      XX  XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX  XX           XX      XX  XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX  XX           XX      XX  XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX   XX           XXXXXXXXXX  XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX          XX           XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX          XX           XX      XX  XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX          XXXXXXXXXX   XX      XX  XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX          XXXXXXXXXX   XX      XX  XX      XX
```

```
*******************************************************************************
*                                                                             *
*                        REPORT HIGHWAY NETWORK SUMMARIES                     *
*                                                                             *
*     REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS                   *
*            ******************************                                   *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.FMB

FILE HEADER ---------- REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:50 CURRENT TIME ---------- 22:12:28

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 116

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TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 1
DATE 30JUN91
TIME 22:12:28

TABLE NO. 1 --

TABLE UNITS -- MILES

TABLE PAGE NO. 1 OF 1

ASSIGNMENT GROUP >>

LINK GROUP 1 VV	0	1	TOTAL
0	.0	.0	.0
1	.0	60.0	60.0
2	.0	17.6	17.6
3	.0	30.6	30.6
TOTAL	.0	108.2	108.2

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TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 2
DATE 30JUN91
TIME 22:12:28

TABLE NO. 2 --

TABLE UNITS -- HOURS -- TIME 1

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	.3	1.2	.0	1.5
2	.0	.0	.3	.0	.3
3	.0	.0	.1	.4	.5
TOTAL	.0	.3	1.7	.4	2.3

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 3
DATE 30JUN91
TIME 22:12:28

TABLE NO. 3 --

TABLE UNITS -- VEHICLE - MILES

TABLE PAGE NO. 1 OF 1

LINK GROUP 1 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	141.0	.0	.0	141.0
2	.0	.0	26.0	.0	26.0
3	.0	.0	.0	159.2	159.2
TOTAL	.0	141.0	26.0	159.2	326.2

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 4
DATE 30JUN91
TIME 22:12:28

TABLE NO. 4 --

TABLE UNITS -- VEHICLE - HOURS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	.5	3.0	.0	3.5
2	.0	.0	.5	.0	.5
3	.0	.0	1.3	1.4	2.7
TOTAL	.0	.5	4.8	1.4	6.7

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT SUMMARIES OF HEAVY TRUCK NETWORK BY LINK CLASS
****

PAGE NO. 5
DATE 30JUN91
TIME 22:12:28

TABLE NO. 5 --

TABLE UNITS -- VEHICLE - DOLLARS

TABLE PAGE NO. 1 OF 1

LINK GROUP 2 >>

LINK GROUP 1 VV	0	1	2	3	TOTAL
0	.0	.0	.0	.0	.0
1	.0	16.0	97.2	.0	113.2
2	.0	.0	14.0	.0	14.0
3	.0	.0	43.7	45.6	89.3
TOTAL	.0	16.0	154.9	45.6	216.5

```
$REPORT HIGHWAY LOAD
$FILE
   INPUT FILE = LODHIST, USER ID = $LODHIST.PER$
$HEADER
     REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR PERSONAL TRIPS
                 ***********************************
                      copyrighted BY pfi, 1990
$END TP FUNCTION
```

Reports the assigned volume for links, A-B, B-A and total.

```
   DCCO / UAG                 REPORT ON LOADING CAR NETWORK W/COST AND CAR TRIPS                          PAGE NO.     1
TRANPLAN SYSTEM              ************************************                                          DATE   30JUN91
  VERSION 6.20                                                                                             TIME  22:12:37


INPUT FILE NAME ---------- LODHIST


   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - LODHIST.PER

FILE HEADER --------------        REPORT ON LOADING CAR NETWORK W/COST AND CAR TRIPS
                                     ************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:17                                                   CURRENT TIME ---------- 22:12:37

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX     XXXXXXXX     XXXXXXXX            XX   XX      XX     XXXXXX      XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX          XX    XX      XX    XXXXXXXX    XXXXXXXXXX
XX      XX   XX      XX   XX      XX         XX     XX      XX   XX      XX   XX      XX
XX      XX   XX           XX      XX        XX      XX      XX   XX      XX   XX
XX      XX   XX           XX      XX       XX       XX      XX   XX      XX   XX
XX      XX   XX           XX      XX      XX        XX      XX   XXXXXXXXXX   XX    XXXX
XX      XX   XX           XX      XX     XX         XX      XX   XX      XX   XX      XX
XX      XX   XX      XX   XX      XX    XX          XX      XX   XX      XX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XX           XXXXXXXXXX   XX      XX   XXXXXXXXXX
XXXXXXXXX     XXXXXXXX     XXXXXXXX   XX            XXXXXXXX    XX      XX    XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX     XXXXXXXX   XX      XX   XXXXXXXXX   XX            XXXXXXXX   XX      XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX   XXX     XX   XXXXXXXXXX  XX           XXXXXXXXXX  XXX     XX
    XX       XX      XX   XX      XX   XXXX    XX   XX      XX  XX           XX      XX  XXXX    XX
    XX       XX      XX   XX      XX   XX XX   XX   XX      XX  XX           XX      XX  XX XX   XX
    XX       XXXXXXXXXX   XX      XX   XX  XX  XX   XXXXXXXXXX  XX           XX      XX  XX  XX  XX
    XX       XXXXXXXXX    XXXXXXXXXX   XX  XX  XX   XXXXXXXXX   XX           XXXXXXXXXX  XX  XX  XX
    XX       XX   XX      XXXXXXXXXX   XX   XX XX   XX          XX           XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX   XX    XXXX   XX          XX           XX      XX  XX    XXXX
    XX       XX     XX    XX      XX   XX     XXX   XX          XXXXXXXXXX   XX      XX  XX     XXX
    XX       XX      XX   XX      XX   XX      XX   XX          XXXXXXXXXX   XX      XX  XX      XX
```

```
*******************************************************************************
*                                                                             *
*                        LOADED HIGHWAY NETWORK REPORTS                       *
*                                                                             *
*      REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR PERSONAL TRIPS        *
*                  ***********************************                        *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.PER

FILE HEADER ---------- REPORT ON LOADING CAR NETWORK W/COST AND CAR TRIPS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:17 CURRENT TIME ---------- 22:12:37

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

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TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR PERSONAL TRIPS
****
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
1	1020	20	0	20	2	1030	50	280	330	3	3020	20	0	20
4	3030	20	0	20	5	3070	20	0	20	6	3080	20	0	20
7	4030	20	0	20	8	4040	20	0	20	9	4070	0	0	0
10	5020	20	0	20	11	5030	20	0	20	12	5040	30	120	150
13	5070	20	0	20	14	5090	30	80	110	15	7040	20	0	20
16	7060	20	0	20	17	7070	20	0	20	18	7090	20	0	20
19	8020	20	0	20	20	8030	20	0	20	21	8040	20	0	20
22	8070	20	0	20	23	8090	20	0	20	24	9020	20	0	20
25	9030	20	50	70	1020	1	0	20	20	1030	2	280	50	330
						3020	20	0	20		3030	50	280	330
3020	3	0	20	20	3030	4	0	20	20	3070	5	0	20	20
	1020	0	20	20		1030	280	50	330		3030	20	0	20
	3030	40	0	40		3020	0	40	40		3080	0	20	20
	5020	0	0	0		3070	0	20	20		4070	20	0	20
						4030	80	230	310					
3080	6	0	20	20	4030	7	0	20	20	4040	8	0	20	20
	3070	20	0	20		3030	230	80	310		4030	10	0	10
						4040	0	10	10		4070	0	0	0
						5030	90	210	300		5040	10	0	10
4070	9	0	0	0	5020	10	0	20	20	5030	11	0	20	20
	3070	0	20	20		3020	0	0	0		4030	210	90	300
	4040	0	0	0		5030	40	0	40		5020	0	40	40
	5070	20	0	20		8020	0	20	20		5040	110	140	250
											8030	0	30	30
5040	12	120	30	150	5070	13	0	20	20	5090	14	80	30	110
	4040	0	10	10		4070	0	20	20		5070	30	80	110
	5030	140	110	250		5040	60	0	60					
	5070	0	60	60		5090	80	30	110					
	5940	0	50	50		7070	0	70	70					
5940	5040	50	0	50	6140	5940	50	0	50	7040	15	0	20	20
	6140	0	50	50		7040	0	50	50		6140	50	0	50
											7060	0	10	10
											8040	10	30	40
7060	16	0	20	20	7070	17	0	20	20	7090	18	0	20	20
	7040	10	0	10		5070	70	0	70		7070	20	0	20

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR PERSONAL TRIPS
****
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
8020	19	0	20	20	8030	20	0	20	20	8040	21	0	20	20
	5020	20	0	20		5030	30	0	30		7040	30	10	40
	8030	20	0	20		8020	0	20	20		8030	20	0	20
	9020	0	20	20		8040	0	20	20		8070	0	20	20
						9030	50	20	70					
8070	22	0	20	20	8090	23	0	20	20	9020	24	0	20	20
	7070	20	0	20		8070	20	0	20		8020	20	0	20
	8040	20	0	20										
	8090	0	20	20										
9030	25	50	20	70										
	8030	20	50	70										

```
$REPORT HIGHWAY LOAD
$FILE
   INPUT FILE = LODHIST, USER ID = $LODHIST.FB$
$HEADER
     REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM BUSINESS TRIPS
                 ***********************************
                      copyrighted BY pfi, 1990
$END TP FUNCTION
```

```
   DCCO / UAG                 REPORT ON LOADING PICKUP NETWORK W/COST AND PICKUP TRIPS                    PAGE NO.     1
TRANPLAN SYSTEM                          ************************************                             DATE   30JUN91
  VERSION 6.20                                                                                             TIME  22:12:46


INPUT FILE NAME ---------- LODHIST


   FILE CHARACTERISTICS
-------------------------

USER FILE IDENTIFICATION - LODHIST.FB

FILE HEADER -------------        REPORT ON LOADING PICKUP NETWORK W/COST AND PICKUP TRIPS
                                            ************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:28                                                   CURRENT TIME ---------- 22:12:46

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

```
XXXXXXXXX    XXXXXXXX    XXXXXXXX          XX  XX     XX    XXXXXX     XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX        XX  XX     XX   XXXXXXXX   XXXXXXXXXX
XX      XX   XX      XX  XX      XX       XX  XX     XX  XX      XX  XX      XX
XX      XX   XX          XX      XX      XX   XX     XX  XX      XX  XX
XX      XX   XX          XX      XX     XX    XX     XX  XX      XX  XX
XX      XX   XX          XX      XX    XX     XX     XX  XXXXXXXXXX  XX    XXXX
XX      XX   XX          XX      XX   XX      XX     XX  XX      XX  XX      XX
XX      XX   XX      XX  XX      XX  XX       XX     XX  XX      XX  XX      XX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX XX         XXXXXXXXXX  XX      XX  XXXXXXXXXX
XXXXXXXXX    XXXXXXXX    XXXXXXXX  XX          XXXXXXXX   XX      XX   XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX    XXXXXXXX   XX     XX  XXXXXXXXX   XX          XXXXXXXX   XX     XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX XXX    XX  XXXXXXXXXX  XX         XXXXXXXXXX  XXX    XX
    XX       XX      XX   XX      XX XXXX   XX  XX      XX  XX         XX      XX  XXXX   XX
    XX       XX      XX   XX      XX XX XX  XX  XX      XX  XX         XX      XX  XX XX  XX
    XX       XXXXXXXXXX   XX      XX XX  XX XX  XXXXXXXXXX  XX         XX      XX  XX  XX XX
    XX       XXXXXXXXX    XXXXXXXXXX XX  XX XX  XXXXXXXXX   XX         XXXXXXXXXX  XX  XX XX
    XX       XX   XX      XXXXXXXXXX XX   XX XX  XX          XX         XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX XX    XXXX  XX          XX         XX      XX  XX    XXXX
    XX       XX     XX    XX      XX XX     XXX  XX          XXXXXXXXXX XX      XX  XX     XXX
    XX       XX      XX   XX      XX XX      XX  XX          XXXXXXXXXX XX      XX  XX      XX
```

```
*******************************************************************************
*                                                                             *
*                        LOADED HIGHWAY NETWORK REPORTS                       *
*                                                                             *
*      REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM BUSINESS TRIPS   *
*                  ***********************************                        *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.FB

FILE HEADER ---------- REPORT ON LOADING PICKUP NETWORK W/COST AND PICKUP TRIPS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:28 CURRENT TIME ---------- 22:12:46

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

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TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM BUSINESS TRIPS
****
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
1	1020	4	0	4	2	1030	7	54	61	3	3020	4	0	4
4	3030	4	0	4	5	3070	4	0	4	6	3080	4	0	4
7	4030	4	0	4	8	4040	4	0	4	9	4070	0	0	0
10	5020	4	0	4	11	5030	4	0	4	12	5040	5	21	26
13	5070	4	0	4	14	5090	5	16	21	15	7040	4	0	4
16	7060	4	0	4	17	7070	4	0	4	18	7090	4	0	4
19	8020	4	0	4	20	8030	4	0	4	21	8040	4	0	4
22	8070	4	0	4	23	8090	4	0	4	24	9020	4	0	4
25	9030	4	10	14	1020	1	0	4	4	1030	2	54	7	61
						3020	4	0	4		3030	7	54	61
3020	3	0	4	4	3030	4	0	4	4	3070	5	0	4	4
	1020	0	4	4		1030	54	7	61		3030	4	0	4
	3030	8	0	8		3020	0	8	8		3080	0	4	4
	5020	0	0	0		3070	0	4	4		4070	4	0	4
						4030	13	44	57					
3080	6	0	4	4	4030	7	0	4	4	4040	8	0	4	4
	3070	4	0	4		3030	44	13	57		4030	2	0	2
						4040	0	2	2		4070	0	0	0
						5030	15	40	55		5040	2	0	2
4070	9	0	0	0	5020	10	0	4	4	5030	11	0	4	4
	3070	0	4	4		3020	0	0	0		4030	40	15	55
	4040	0	0	0		5030	8	0	8		5020	0	8	8
	5070	4	0	4		8020	0	4	4		5040	19	26	45
											8030	0	6	6
5040	12	21	5	26	5070	13	0	4	4	5090	14	16	5	21
	4040	0	2	2		4070	0	4	4		5070	5	16	21
	5030	26	19	45		5040	11	0	11					
	5070	0	11	11		5090	16	5	21					
	5940	0	10	10		7070	0	14	14					
5940	5040	10	0	10	6140	5940	10	0	10	7040	15	0	4	4
	6140	0	10	10		7040	0	10	10		6140	10	0	10
											7060	0	2	2
											8040	2	6	8
7060	16	0	4	4	7070	17	0	4	4	7090	18	0	4	4
	7040	2	0	2		5070	14	0	14		7070	4	0	4

DCCO / UAG
TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM BUSINESS TRIPS
****
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
8020	19	0	4	4	8030	20	0	4	4	8040	21	0	4	4
	5020	4	0	4		5030	6	0	6		7040	6	2	8
	8030	4	0	4		8020	0	4	4		8030	4	0	4
	9020	0	4	4		8040	0	4	4		8070	0	4	4
						9030	10	4	14					
8070	22	0	4	4	8090	23	0	4	4	9020	24	0	4	4
	7070	4	0	4		8070	4	0	4		8020	4	0	4
	8040	4	0	4										
	8090	0	4	4										
9030	25	10	4	14										
	8030	4	10	14										

```
$REPORT HIGHWAY LOAD
$FILE
   INPUT FILE = LODHIST, USER ID = $LODHIST.FMG$
$HEADER
     REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT GRAIN TRIPS
                 ***********************************
                      copyrighted BY pfi, 1990
$END TP FUNCTION
```

```
   DCCO / UAG              REPORT ON LOADING FARM TRUCK NETWORK W/COST AND FARM TRUCK TRIPS                    PAGE NO.     1
TRANPLAN SYSTEM                ********************************************                                    DATE   30JUN91
  VERSION 6.20                                                                                                 TIME  22:12:54


INPUT FILE NAME ---------- LODHIST

   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - LODHIST.FMG

FILE HEADER --------------     REPORT ON LOADING FARM TRUCK NETWORK W/COST AND FARM TRUCK TRIPS
                                  ********************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:39                                                   CURRENT TIME ---------- 22:12:54

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
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XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX        XX  XX     XX   XXXXXXXX   XXXXXXXXXX
XX      XX   XX      XX  XX      XX       XX  XX     XX  XX      XX  XX      XX
XX      XX   XX          XX      XX      XX   XX     XX  XX      XX  XX
XX      XX   XX          XX      XX     XX    XX     XX  XX      XX  XX
XX      XX   XX          XX      XX    XX     XX     XX  XXXXXXXXXX  XX    XXXX
XX      XX   XX          XX      XX   XX      XX     XX  XX      XX  XX      XX
XX      XX   XX      XX  XX      XX  XX       XX     XX  XX      XX  XX      XX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX XX         XXXXXXXXXX  XX      XX  XXXXXXXXXX
XXXXXXXXX    XXXXXXXX    XXXXXXXX  XX          XXXXXXXX   XX      XX   XXXXXXXXX

XXXXXXXXXX   XXXXXXXXX    XXXXXXXX   XX     XX  XXXXXXXXX   XX          XXXXXXXX   XX     XX
XXXXXXXXXX   XXXXXXXXXX   XXXXXXXXXX XXX    XX  XXXXXXXXXX  XX         XXXXXXXXXX  XXX    XX
    XX       XX      XX   XX      XX XXXX   XX  XX      XX  XX         XX      XX  XXXX   XX
    XX       XX      XX   XX      XX XX XX  XX  XX      XX  XX         XX      XX  XX XX  XX
    XX       XXXXXXXXXX   XX      XX XX  XX XX  XXXXXXXXXX  XX         XX      XX  XX  XX XX
    XX       XXXXXXXXX    XXXXXXXXXX XX  XX XX  XXXXXXXXX   XX         XXXXXXXXXX  XX  XX XX
    XX       XX   XX      XXXXXXXXXX XX   XX XX  XX          XX         XXXXXXXXXX  XX   XX XX
    XX       XX    XX     XX      XX XX    XXXX  XX          XX         XX      XX  XX    XXXX
    XX       XX     XX    XX      XX XX     XXX  XX          XXXXXXXXXX XX      XX  XX     XXX
    XX       XX      XX   XX      XX XX      XX  XX          XXXXXXXXXX XX      XX  XX      XX
```

```
*****************************************************************************************
*                                                                                       *
*                              LOADED HIGHWAY NETWORK REPORTS                           *
*                                                                                       *
*        REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT GRAIN TRIPS          *
*                     ************************************                              *
*                          COPYRIGHTED BY PFI, 1990                                     *
*                                                                                       *
*****************************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.FMG

FILE HEADER ---------- REPORT ON LOADING FARM TRUCK NETWORK W/COST AND FARM TRUCK TRIPS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:39 CURRENT TIME ---------- 22:12:55

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 118

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TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT GRAIN TRIPS
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
1	1020	2	0	2	2	1030	0	16	16	3	3020	2	0	2
4	3030	6	0	6	5	3070	4	0	4	6	3080	2	0	2
7	4030	4	0	4	8	4040	4	0	4	9	4070	2	0	2
10	5020	4	0	4	11	5030	4	0	4	12	5040	0	20	20
13	5070	2	0	2	14	5090	0	20	20	15	7040	4	0	4
16	7060	4	0	4	17	7070	2	0	2	18	7090	2	0	2
19	8020	4	0	4	20	8030	4	0	4	21	8040	4	0	4
22	8070	2	0	2	23	8090	4	0	4	24	9020	4	0	4
25	9030	0	14	14	1020	1	0	2	2	1030	2	16	0	16
						3020	2	0	2		3030	0	16	16
3020	3	0	2	2	3030	4	0	6	6	3070	5	0	4	4
	1020	0	2	2		1030	16	0	16		3030	0	0	0
	3030	4	0	4		3020	0	4	4		3080	0	2	2
	5020	0	0	0		3070	0	0	0		4070	6	0	6
						4030	0	6	6					
3080	6	0	2	2	4030	7	0	4	4	4040	8	0	4	4
	3070	2	0	2		3030	6	0	6		4030	2	0	2
						4040	0	2	2		4070	0	0	0
						5030	2	2	4		5040	2	0	2
4070	9	0	2	2	5020	10	0	4	4	5030	11	0	4	4
	3070	0	6	6		3020	0	0	0		4030	2	2	4
	4040	0	0	0		5030	6	0	6		5020	0	6	6
	5070	8	0	8		8020	2	4	6		5040	10	0	10
											8030	0	0	0
5040	12	20	0	20	5070	13	0	2	2	5090	14	20	0	20
	4040	0	2	2		4070	0	8	8		5070	0	20	20
	5030	0	10	10		5040	0	0	0					
	5070	0	0	0		5090	20	0	20					
	5940	0	8	8		7070	0	10	10					
5940	5040	8	0	8	6140	5940	8	0	8	7040	15	0	4	4
	6140	0	8	8		7040	0	8	8		6140	8	0	8
											7060	0	2	2
											8040	2	4	6
7060	16	0	4	4	7070	17	0	2	2	7090	18	0	2	2
	7040	2	0	2		5070	10	0	10		7070	2	0	2

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REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT GRAIN TRIPS
****
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
8020	19	0	4	4	8030	20	0	4	4	8040	21	0	4	4
	5020	4	2	6		5030	0	0	0		7040	4	2	6
	8030	6	0	6		8020	0	6	6		8030	6	2	8
	9020	0	4	4		8040	2	6	8		8070	0	2	2
						9030	14	0	14					
8070	22	0	2	2	8090	23	0	4	4	9020	24	0	4	4
	7070	4	0	4		8070	4	0	4		8020	4	0	4
	8040	2	0	2										
	8090	0	4	4										
9030	25	14	0	14										
	8030	0	14	14										

```
$REPORT HIGHWAY LOAD
$FILE
   INPUT FILE = LODHIST, USER ID = $LODHIST.FMB$
$HEADER
     REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT BEET TRIPS
                 ***********************************
                      copyrighted BY pfi, 1990
$END TP FUNCTION
```

```
   DCCO / UAG                REPORT ON LOADING HEAVY TRUCK NETWORK W/COST AND HEAVY TRUCK TRIPS                    PAGE NO.     1
TRANPLAN SYSTEM                                  ************************************                                DATE   30JUN91
  VERSION 6.20                                                                                                       TIME  22:13:04


INPUT FILE NAME ---------- LODHIST


   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - LODHIST.FMB

FILE HEADER --------------      REPORT ON LOADING HEAVY TRUCK NETWORK W/COST AND HEAVY TRUCK TRIPS
                                                 ************************************


GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ------------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91                                                    CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:11:50                                                   CURRENT TIME ---------- 22:13:04

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   116
```

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XXXXXXXXX    XXXXXXXX    XXXXXXXX          XX  XX     XX    XXXXXX     XXXXXXXX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX        XX  XX     XX   XXXXXXXX   XXXXXXXXXX
XX      XX   XX      XX  XX      XX       XX   XX     XX  XX      XX  XX      XX
XX      XX   XX          XX      XX      XX    XX     XX  XX      XX  XX
XX      XX   XX          XX      XX     XX     XX     XX  XX      XX  XX
XX      XX   XX          XX      XX    XX      XX     XX  XXXXXXXXXX  XX    XXXX
XX      XX   XX          XX      XX   XX       XX     XX  XX      XX  XX      XX
XX      XX   XX      XX  XX      XX  XX        XX     XX  XX      XX  XX      XX
XXXXXXXXXX   XXXXXXXXXX  XXXXXXXXXX XX          XXXXXXXXXX  XX      XX  XXXXXXXXXX
XXXXXXXXX    XXXXXXXX    XXXXXXXX  XX           XXXXXXXX   XX      XX   XXXXXXXXX

XXXXXXXXXX  XXXXXXXXX    XXXXXXXX   XX     XX  XXXXXXXXX   XX          XXXXXXXX   XX     XX
XXXXXXXXXX  XXXXXXXXXX   XXXXXXXXXX XXX    XX  XXXXXXXXXX  XX         XXXXXXXXXX  XXX    XX
    XX      XX      XX   XX      XX XXXX   XX  XX      XX  XX         XX      XX  XXXX   XX
    XX      XX      XX   XX      XX XX XX  XX  XX      XX  XX         XX      XX  XX XX  XX
    XX      XXXXXXXXXX   XX      XX XX  XX XX  XXXXXXXXXX  XX         XX      XX  XX  XX XX
    XX      XXXXXXXXX    XXXXXXXXXX XX  XX XX  XXXXXXXXX   XX         XXXXXXXXXX  XX  XX XX
    XX      XX   XX      XXXXXXXXXX XX   XX XX  XX          XX         XXXXXXXXXX  XX   XX XX
    XX      XX    XX     XX      XX XX    XXXX  XX          XX         XX      XX  XX    XXXX
    XX      XX     XX    XX      XX XX     XXX  XX          XXXXXXXXXX XX      XX  XX     XXX
    XX      XX      XX   XX      XX XX      XX  XX          XXXXXXXXXX XX      XX  XX      XX
```

```
*******************************************************************************
*                                                                             *
*                        LOADED HIGHWAY NETWORK REPORTS                       *
*                                                                             *
*      REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT BEET TRIPS   *
*                  ***********************************                        *
*                       COPYRIGHTED BY PFI, 1990                              *
*                                                                             *
*******************************************************************************
```

FILE CHARACTERISTICS

USER FILE IDENTIFICATION - LODHIST.FMB

FILE HEADER ---------- REPORT ON LOADING HEAVY TRUCK NETWORK W/COST AND HEAVY TRUCK TRIPS
****

GENERATING FUNCTION ------ LOAD HIGHWAY NETWORK

TYPE OF FILE ---------- LODHIST

GENERATION FILE NAME ----- LODHIST

GENERATION DATE ---------- 30JUN91 CURRENT DATE ---------- 30JUN91

GENERATION TIME ---------- 22:11:50 CURRENT TIME ---------- 22:13:04

FILE SIZE ---------- MAXIMUM ZONE = 25

MAXIMUM NODE NO. = 9030

NUMBER OF LINKS = 116

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TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT BEET TRIPS
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
1	1020	2	0	2	2	1030	0	27	27	3	3020	2	0	2
4	3030	2	0	2	5	3070	4	0	4	6	3080	4	0	4
7	4030	4	0	4	8	4040	0	0	0	9	4070	14	14	28
10	5020	2	0	2	11	5030	2	0	2	12	5040	0	24	24
13	5070	6	0	6	14	5090	0	0	0	15	7040	2	0	2
16	7060	0	0	0	17	7070	2	0	2	18	7090	6	0	6
19	8020	2	0	2	20	8030	0	0	0	21	8040	2	0	2
22	8070	2	0	2	23	8090	5	0	5	24	9020	2	0	2
25	9030	0	0	0	1020	1	0	2	2	1030	2	27	0	27
						3020	2	0	2		3030	0	27	27
3020	3	0	2	2	3030	4	0	2	2	3070	5	0	4	4
	1020	0	2	2		1030	27	0	27		3030	0	0	0
	3030	4	0	4		3020	0	4	4		3080	0	4	4
	5020	0	0	0		3070	0	0	0		4070	8	0	8
						4030	0	21	21					
3080	6	0	4	4	4030	7	0	4	4	4040	8	0	0	0
	3070	4	0	4		3030	21	0	21		4030	14	0	14
						4040	0	14	14		4070	0	14	14
						5030	0	3	3		5040	0	0	0
4070	9	14	14	28	5020	10	0	2	2	5030	11	0	2	2
	3070	0	8	8		3020	0	0	0		4030	3	0	3
	4040	14	0	14		5030	6	0	6		5020	0	6	6
	5070	4	10	14		8020	0	4	4		5040	12	3	15
											8030	0	4	4
5040	12	24	0	24	5070	13	0	6	6	5090	14	0	0	0
	4040	0	0	0		4070	10	4	14		5070	0	0	0
	5030	3	12	15		5040	15	0	15					
	5070	0	15	15		5090	0	0	0					
	5940	0	0	0		7070	0	15	15					
5940	5040	0	0	0	6140	7040	0	0	0	7040	15	0	2	2
											6140	0	0	0
											7060	0	0	0
											8040	2	0	2
7060	16	0	0	0	7070	17	0	2	2	7090	18	0	6	6
	7040	0	0	0		5070	15	0	15		7070	6	0	6

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TRANPLAN SYSTEM
VERSION 6.20

REPORT OF OUR SMALL NETWORK ASSIGNED VOLUMES FOR FARM MKT BEET TRIPS
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ASSIGNED VOLUMES -- 100 PERCENT LOADING -- PURPOSE 1

ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY	ANODE	BNODE	A-B	B-A	TWOWAY
8020	19	0	2	2	8030	20	0	0	0	8040	21	0	2	2
	5020	4	0	4		5030	4	0	4		7040	0	2	2
	8030	0	0	0		8020	0	0	0		8030	4	0	4
	9020	0	2	2		8040	0	4	4		8070	0	0	0
						9030	0	0	0					
8070	22	0	2	2	8090	23	0	5	5	9020	24	0	2	2
	7070	7	0	7		8070	5	0	5		8020	2	0	2
	8040	0	0	0										
	8090	0	5	5										
9030	25	0	0	0										
	8030	0	0	0										

```
$MACRO HIGHWAY NETWORK UPDATE
$FILES
     INPUT FILE = MACIN, USER ID = $SMNET91.DAT$
     OUTPUT FILE = MACOUT, USER ID = $SMNET91S.DAT$
$HEADERS
          CHANGING SPEEDS ON ROADS FROM 40,55,60 TO 30,35,50
                 ***********************************
                      copyrighted BY pfi, 1990
$DATA
     LINK GROUP 1 = 1, CHANGE, SPEED 1 = R 3000
     LINK GROUP 1 = 2, CHANGE, SPEED 1 = R 3500
     LINK GROUP 1 = 3, CHANGE, SPEED 1 = R 5000
$END TP FUNCTION
```

This function allows you to make broad changes to the links. This is possible if the links can be identified by common attributes. In a large network, this saves time and reduces the manual error that come with editing.

```
   DCCO / UAG                        A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS                        PAGE NO.     1
TRANPLAN SYSTEM                      ***********************************************                      DATE   30JUN91
  VERSION 6.20                                COPYRIGHTED BY PFI, 1990                                    TIME  22:13:14


INPUT FILE NAME ---------- MACIN


   FILE CHARACTERISTICS
--------------------------

USER FILE IDENTIFICATION - SMNET91.DAT

FILE HEADER --------------                 A SMALL FANCIFUL HIGHWAY NETWORK TO RUN TESTS
                                           ***********************************************
                                                   COPYRIGHTED BY PFI, 1990

GENERATING FUNCTION ------ BUILD HIGHWAY NETWORK

TYPE OF FILE ------------- HWYNET

GENERATION FILE NAME ----- HWYNET

GENERATION DATE ---------- 30JUN91                                                  CURRENT DATE ----------  30JUN91

GENERATION TIME ---------- 22:07:46                                                 CURRENT TIME ---------- 22:13:14

FILE SIZE ---------------- MAXIMUM ZONE      =    25

                           MAXIMUM NODE NO.  =  9030

                           NUMBER OF LINKS   =   118
```

This completes the example, but it is really just the start of the process. From here you must analyze and combine the information to obtain meaningful results for your own research question. A large amount of post processing may be required or very little. Many alternative scenarios could be tried. Small problems, like the example, allow a great deal of "testing" at relatively low cost.

Additional Background for a Full Implementation

Date Requirement To Consider:

A. Infrastructure cost data
   Road maintenance cost by:
      age
      type surface
      width
      traffic volume
   Bridge maintenance cost by
      structure type
      width
      traffic volume
   Road construction costs by
      surface
      width
      type
      design KIPS
   Bridge construction costs by
      structure type
      width
   Road rehabilitation/improvement cost by
      surface
      width
      traffic design volume (KIPS)

B. Vehicle cost data
   Operating cost by type of vehicle by road type
      surface
      width (# lanes)
      condition

C. Safety factors

D. Demand data
   Personal travel by types by number of people
      commuter travel
      automobile business travel--salesmen, etc.
   Farm to market travel by vehicle type
      by commodity
      by axle weight units
   Town to farm deliveries by type of vehicle
      commodity
      by axle weight units
   Oversize vehicles
   Intrafarm trips
      by vehicle type

F. Infrastructure data
   Road information by segment
      surface type
      width
      condition
      jurisdiction
   Bridge information
      length
      condition
      location
      jurisdiction
   Building site locations by use

Proposed Procedure

A. Select small rural areas with low traffic volume on local rural roads. Collect data in the selected area on farm and household characteristics and travel patterns .

B. Use standard budgeting techniques to develop variable cost estimates by vehicle type for the major types of vehicles using local roads.

C. Use a network model to analyze the collected travel pattern types of vehicles using local roads to estimate minimum cost transportation patterns.

D. Collect data from state and county officials and published reports on local road and bridge maintenance, resurfacing and reconstruction costs. Conduct benefit/cost analyses of alternative road investment strategies and simulate the impacts of alternative levels of traffic for these investment strategies.

Discussion of Procedures and Alternatives

The determination of current and potential traffic volumes is probably the most critical and most difficult data problem. Should demand be estimated by census, sampling of farms and households or estimated from secondary sources? To some extent, the detail of the network model can influence the choice. If the model is detailed enough to include all or most building sites as individual traffic generators, possibly a census such as found in Baumel (1) or a statistical sample is required. If the model is less precise say with origin nodes every 2 miles (4 sq. miles per origin) then secondary data including traffic count taken at intersection and ag production estimates from ASCS data might be used. School bus routes, mail routes and milk routes, etc., can be determined in interviews.

Emphasis on transportation demand data collection may vary depending on whether the focus of the study is on road maintenance cost and/or agricultural marketing costs or on vehicle operating costs and travel time.

If the focus is on road costs, more resources need to be expended on truck trips by vehicle types and KIPS. An analysis of the operating costs (over the road) of farm tractors, etc., and estimates of road damage by heavy farm vehicles should be developed.

Variable cost estimates exist for the major types of vehicles. Data is sparse for differences in operating costs over different road surfaces.

There are many network models available to estimate minimum cost transportation patterns including ones that run on micro 2computers. Proprietary software packages that have many other features are available for prices ranging from $1000 to $10,000. Unfortunately, many of these are modifications of mainframe packages for micro computers and do not have the flexibility or node-link capacities that are now possible.

Systematic information on local roads may not be readily available. This may be an area where primary data collection is needed. One problem is that traffic is too sparse on many rural roads to do damage so that maintenance cost is not a function of traffic volume. A great deal of information is available from the road database at the Minnesota Department of Transportation.

Summary and Closing Remarks

This paper has presented a basic introduction to transportation modeling in a rural setting with methodology for those familiar with microcomputer hardware, software and operating systems. Its intent has been to present a logical example, identify important reference in the literature, and provide a complement to the TRANPLAN manual for this type of research.

What is most striking about this methodology is the wide variety of situations to which it may be applied. The microcomputer has reduced the cost of applying these techniques and the necessary data handling. One can see, then, that transportation modeling techniques are a valued, and relatively new

asset in the rural road management "tool box". The usefulness of this methodology will depend on the quality and cost of the necessary data and the extent to which the current system (i.e. county engineer) is efficient in allocating the scare resources. If the payback of this type of analysis is significantly positive it can be rapidly adopted

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