

社会開発調査部報告書

**MASTER PLAN STUDY**  
**ON**  
**VISAYAS AND MINDANAO ISLANDS STRATEGIC ROAD**  
**NETWORK DEVELOPMENT PROJECT**

**FINAL REPORT**

**DATABASE MANUAL**

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**MARCH 1999**

**KATAHIRA & ENGINEERS INTERNATIONAL**  
**YACHIYO ENGINEERING CO., LTD.**

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JAPAN INTERNATIONAL COOPERATION AGENCY  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS  
REPUBLIC OF THE PHILIPPINES

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**ON**  
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Appendix 2-1	DATA CHECK FOR ROAD AND BRIDGE INVENTORY
Appendix 3-1	TRAFFIC ANALYSIS PROGRAMS

### NOTICE TO USERS

*Microsoft Windows 97*  
*Microsoft Excel*  
*Microsoft Power Station*  
are products of Microsoft Corporation in the USA.  
*Paradox for Windows*  
is a product of Borland International in the USA.  
*MapInfo Professional*  
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# DATABASE OF THE MASTER PLAN STUDY

## 1. INTRODUCTION

This database manual was prepared in the course of the Master Plan Study on Visayas and Mindanao Islands Strategic Road Network Development Project, a master plan study conducted by Japan International Cooperation Agency (JICA) in collaboration with Department of Public Works and Highways (DPWH) of the Philippines to establish short (first 6 years), medium (second 6 years) and long (third 6 years) term road network development program for Visayas and Mindanao islands in the country.

The study covers road and bridge inventory and condition survey for all national roads and some selected provincial roads in the study area with total length of 21,260 km. Roadside origin-destination survey and traffic count survey were also carried out at 77 different stations in the area for assessment of existing traffic features and forecast of future traffic. The projects to be implemented were identified based on existing road condition, improvement needs, economic viabilities and contribution to regional economy. Implementation schedule was then drawn considering annual fund allocation to road development, regional balance and urgency of the project.

All data utilized for formulation of above Master Plan Program was incorporated in a database for the purposes of future update and review. The Master Plan Database comprises the following set of data:

- Road Inventory Survey Data
- Bridge Inventory Survey Data
- Present and Future Socio-Economic Framework
- Generation / Attraction Model
- Present and Future OD Matrix
- Traffic Volume of Each Link
- Project Information
- Implementation Schedule
- Master Plan Map

The data in the Master Plan Database is classified and sorted by data category and type and stored in separate sub-directories. Data linkage between each data and process in synchronized way may be possible in some extent utilizing Macro programs and FORTRAN programs developed by the Study Team. However, for easy access to database by ordinary users, most data is stored in text file format or format with widely used softwares such as MS-Excel. No specific database software was adopted.

This Database Manual describes structure of the Master Plan Database, its data format and procedure of input, output, retrieval and updating of the data.

## 1.1 DATA STRUCTURE

Figure 1-1 illustrates directory tree of database in a hard disk. The data of the Master Plan Study is classified into five categories, i.e. highway, traffic, socio-economic, project and maps. Each category has its own folder and contains the following set of data:

- 1) Highway Inventory Database Subsystem  
Directory Name : **HIGHWAY**  
Type of Data Stored : Road Inventory Data  
Bridge Inventory Data  
Travel Speed Data  
Road Network Data (raw Data)  
Summary of Inventory Data
- 2) Traffic Database Subsystem  
Directory Name : **TRAFFIC**  
Type of Data Stored : Traffic Count Data  
OD Survey Data  
Traffic Volume Data (present and future)  
Network Data  
OD Data (present and future)  
Traffic Analysis Programs  
Sea and Air Transport Data
- 3) Socio-Economic Database Subsystem  
Directory Name : **SOCIO-ECO**  
Type of Data Stored : Population Projection Data  
GRDP Projection Data
- 4) Project Database Subsystem  
Directory Name : **PROJECT**  
Type of Data Stored : Project Profile  
Project Schedule  
Project Related Data
- 5) GIS Database Subsystem  
Directory Name : **MAP**  
Type of Data Stored : Existing Condition Map  
Master Plan Map  
Project Location Map

Contents of each directory is discussed in succeeding sections and detailed file structure of each data file is presented in appendices.

### - CAUTION -

Care must be taken in changing directory names and filenames in the database. Programs and macro-commands in the database use pre-specified directory path and filenames for data reference and automatic file links. Changing names always require update of these programs and macro commands. Directory names and filenames should not be changed without consulting programmers or database specialists.

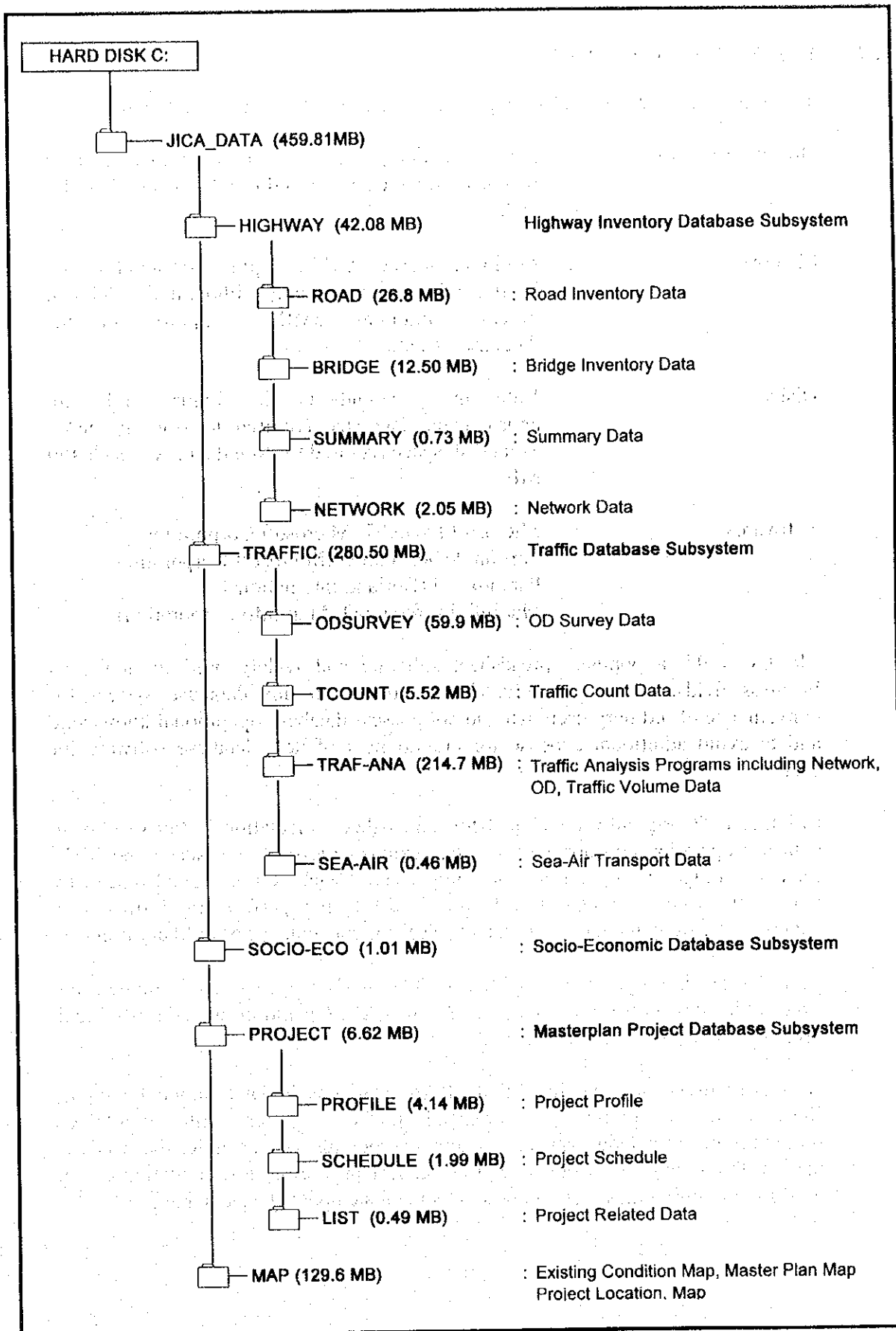


FIGURE 1-1 DATA STRUCTURE OF MASTER PLAN DATABASE

## 1.2 SYSTEM REQUIREMENTS

The following hardware and software are required to run programs efficiently:

- Operating System : 386 or greater processor with 32-bit external data path is preferable since Windows 97 runs with 32-bit code.
- Memory : Minimum 4MB of RAM is required for Windows 97. To run softwares comfortably without undue delay in process, minimum 16MB is required for this database system.
- Disks : Values inside parenthesis in Figure 1-1 are approximate data size required to store in disks. Total disk space required to store data may reach 460 MB.
- Softwares : Microsoft Excel 97 (Microsoft Corporation)  
Fortran Power Station (Microsoft Corporation)  
Paradox 4.5 (Borland International)  
MapInfo Professional (Map Info Corporation)

MS Excel 97, a popular spreadsheet software and widely used in numerous business fields, is used as a database software in this database system for convenience of ordinary users who do not possess database operational knowledge and to avoid additional expense for procurement of new database software for users.

MS Excel 97 originally developed for spreadsheet calculation is fairly weak in database operation and normally requires extensive size of disk space and RAM for data storage and operation since properties of each cell are saved repeatedly along spreadsheet. Though Excel spreadsheet is not perfect file format as a database, the study team dared to adopt Excel for convenience of ordinary users.

Traffic analysis programs are written in FORTRAN language and compiled into executable files with file extension name of .EXE. Operation procedures of each program are discussed in this Manual.

Ordinarily users can run these FORTRAN programs in DOS mode by typing filename of a program. Experienced traffic engineer with FORTRAN programming knowledge can revise source programs whenever he/she needs to have different analysis, process or print out format. Fortran Power Station can be used for compiling these revised programs to create updated executable files.

## 2. HIGHWAY INVENTORY DATABASE

### 2.1 DATA STRUCTURE

Road and bridge inventory data is stored in **HIGHWAY** directory with Excel 97 file format. Data structure of road and bridge inventory database is graphically presented in Figure 2-1.

One Excel file contains road inventory or bridge inventory data of one province with filename of \*\*\*.ROAD.XLS for road inventory data and \*\*\*.BRGE.XLS for bridge inventory data. The first three asterisks (\*\*\*) in the filename denote province code composed of three alphanumeric characters, e.g. 055ROAD.XLS is a road inventory data of Masbate province while 4B1BRGE.XLS is a bridge inventory data of Marinduque Province. List of province code is presented in Table 2-1.

Road and bridge inventory data of Iloilo City and Davao City is stored in separate files from the provinces for simplicity of data analysis.

In addition to inventory data, there are numerous number of summary sheets created from inventory data using macro programs.

The file with a name of *Study-Area-Summaries.xls* in **SUMMARY** directory assembles summary sheets in one Workbook together with macro programs utilized for creation of the summary sheets.

*Travel.xls* file in **HIGHWAY** directory contains table of vehicle operating speed by surface condition and is referred by inventory data files for computation of travel time of each road link.

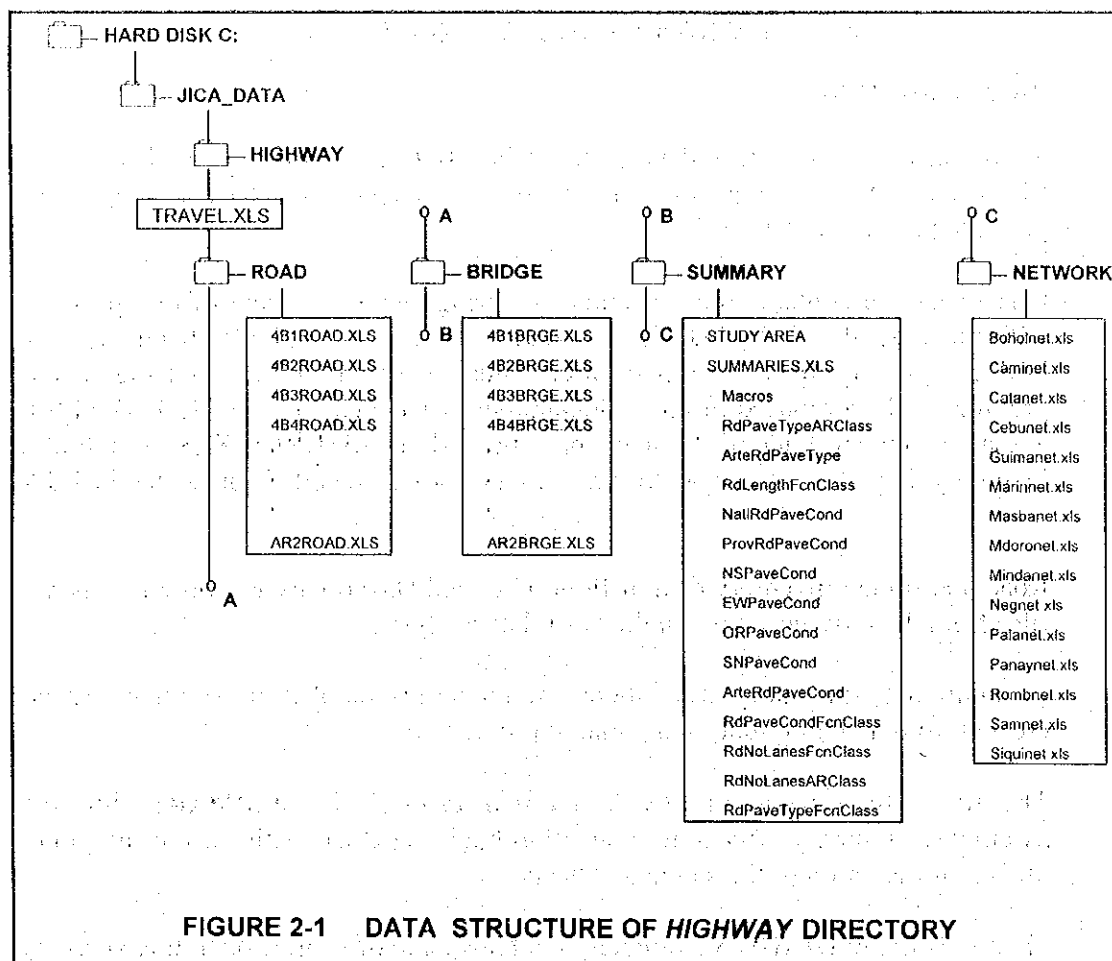
File structure and contents of each Excel file and its data entry, retrieval and update procedures are briefly discussed in the succeeding sections.

### 2.2 ROAD INVENTORY DATA

#### 2.2.1 Road Inventory Data Sheet

Table 2-2 shows a sample of road inventory data of road link 056-21A in Catanduanes province while file structure of an inventory file is shown in Figure 2-2. One spreadsheet contains road inventory data of one road link in a province. First sheet of a road inventory data file is a summary sheet which contains road link number, link length in km and travel time of each link in minutes. If there are 30 road links in a province, for example, there should be 31 sheets including summary sheet in the road inventory file.

Each sheet has its unique sheet name representing road number of the road link, e.g. sheet contains inventory data of road link 056-21A has sheet name of 21A in the inventory file.



**TABLE 2-1 PROVINCE CODE**

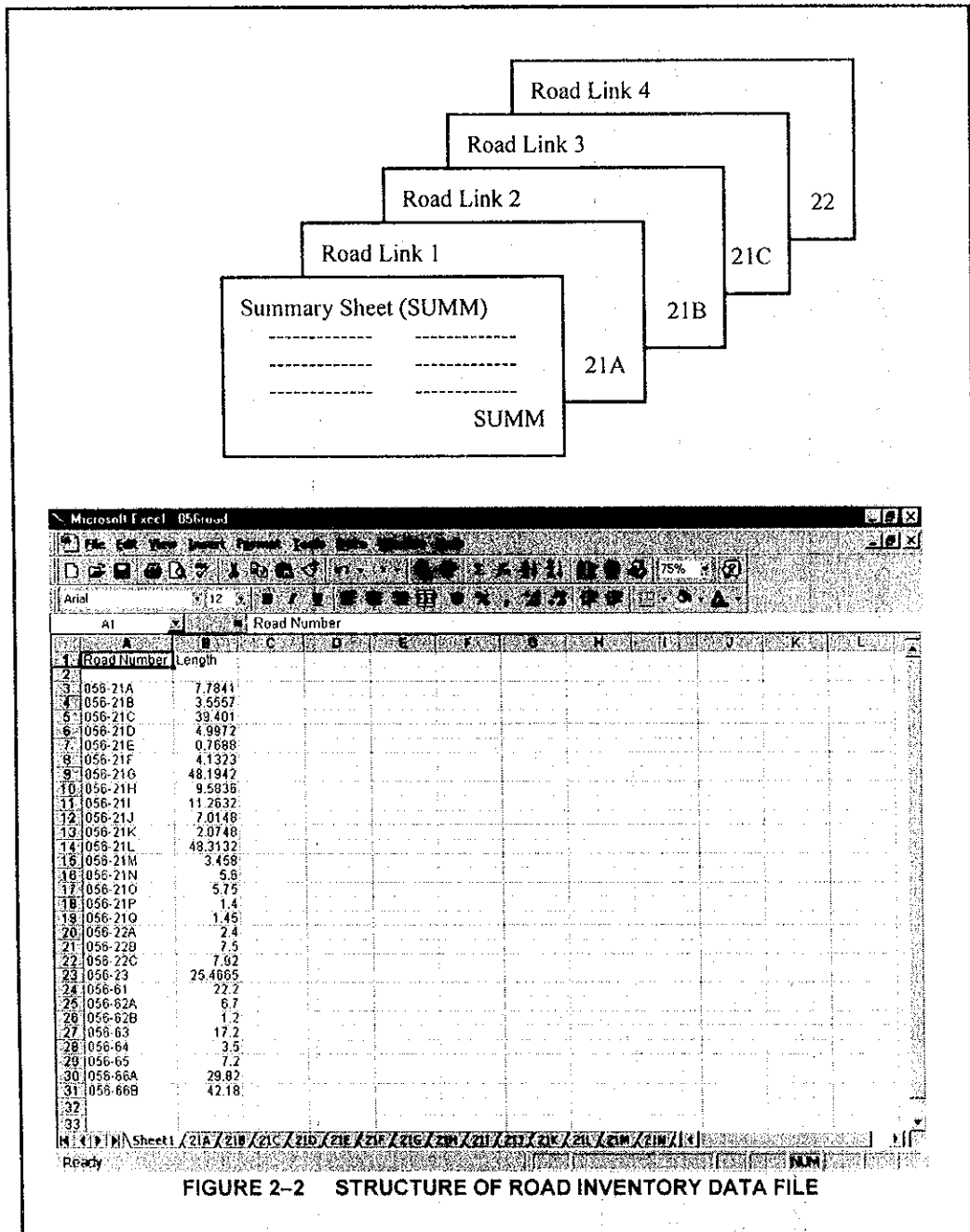
Region	Province	Province Code
IV-B	Marinduque	4B1
	Occidental Mindoro	4B2
	Oriental Mindoro	4B3
	Palawan	4B4
	Romblon	4B5
V	Masbate	055
	Catanduanes	056
VI	Aklan	061
	Antique	062
	Capiz	063
	Iloilo	064
	Guimaras	065
	Negros Occidental	066
	Iloilo City	067
VII	Bohol	71
	Cebu	72
	Negros Oriental	73
	Siquijor	74
VIII	Leyte	81
	Southern Leyte	82
	Billiran	83
	Eastern Samar	84
	Northern Samar	85
	Western Samar	86

Region	Province	Province Code
IX	Zambo. del Norte	091
	Zambo. del Sur	092
X	Bukidnon	101
	Misamis Occidental	102
	Misamis Oriental	103
	Camiguin	104
XI	Davao del Norte	111
	Davao del Sur	112
	Davao Oriental	113
	South Cotabato	114
	Saranggani	115
	Davao City	116
XII	Lanao del Norte	121
	North Cotabato	122
	Sultan Kudarat	123
XIII	Agusan del Norte	131
	Agusan del Sur	132
	Surigao del Norte	133
	Surigao del Sur	134
ARMM	Lanao del Sur	AR1
	Maguindanao	AR2

2

7.784

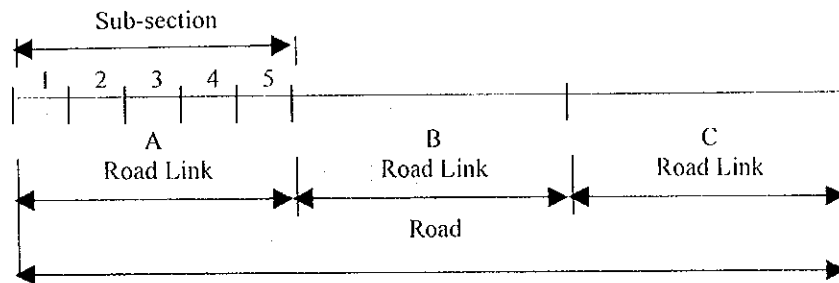
The Summary Sheet in an inventory file is created by Macro programs of Excel. The data in this sheet is not automatically updated, user shall run Macro program *Sumroad* to update the sheet. Update time and date of the summary sheet will be placed on the first row of the sheet to remind user when he/she updated the summary sheet.





Rules naming road number of a link is presented in Figure 2-3. One road is subdivided into several road links at intersections with other roads or municipal centers as shown in the figure. These subdivided road links are named as **LINK** in traffic analysis and become a unit road section of road network.

One road link is further subdivided into subsections whenever road condition changes.



Road links intersecting with newly proposed road is divided into two road links with suffix "X" and "Y". If a road does not intersect other roads or does not pass through municipal centers, the road is not subdivided at all.

Shaded cells in a sheet are data entry cells where users enter inventory data while unshaded cells are protected cells where users cannot enter any data. Unshaded cells contain Excel formulae or functions which will automatically update values of the cells whenever data is entered in shaded cells. To avoid accidental loss or erase of formulae and functions in the protected cells, password is set in all. Users cannot edit data in these protected cells

Description of data in each cell is briefly discussed in Table 2-3.

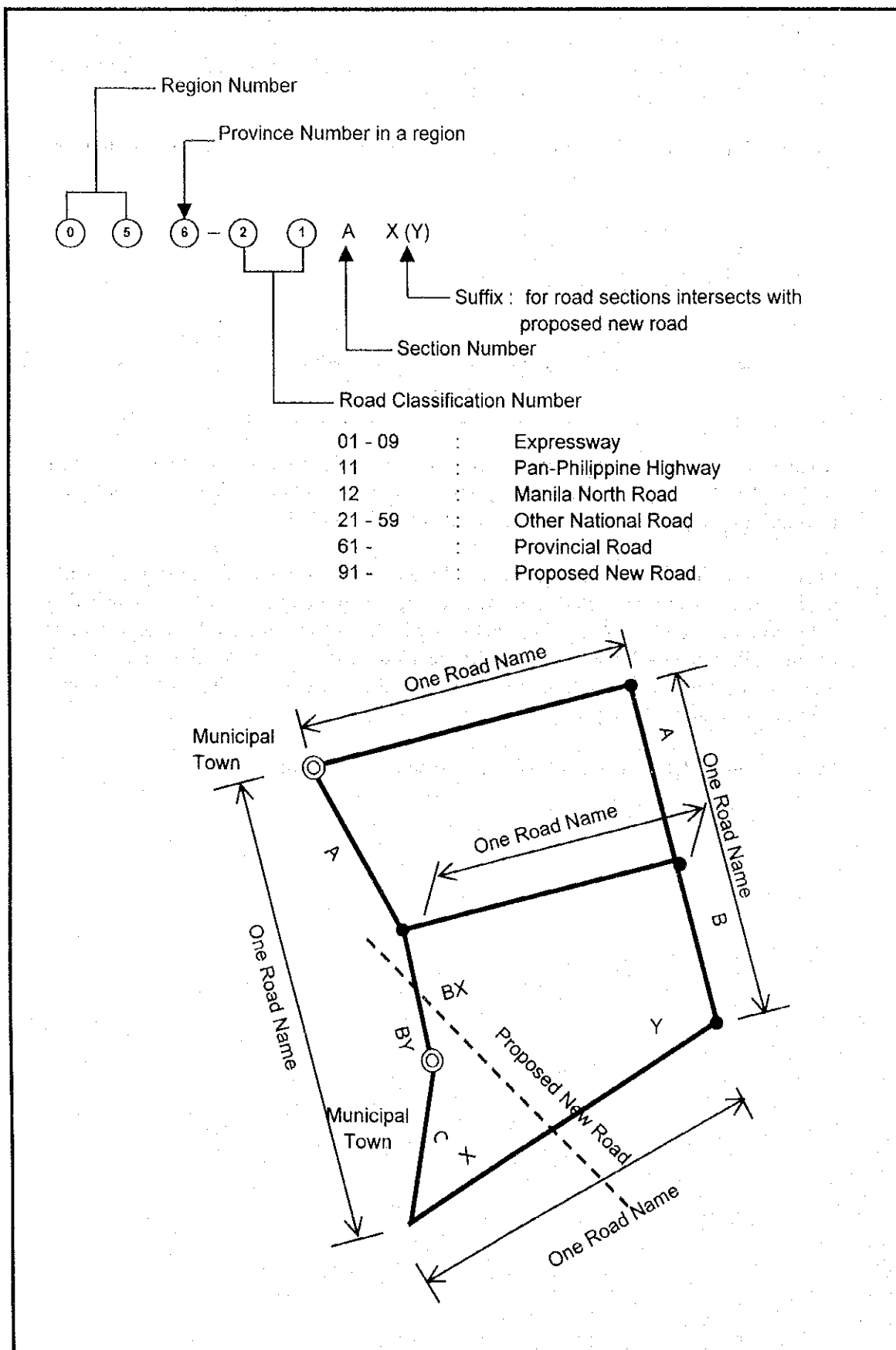


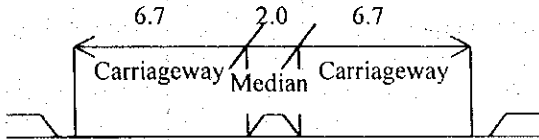
FIGURE 2-3 RULES OF NAMING ROAD NUMBER

TABLE 2-3(1) DESCRIPTION OF ROAD INVENTORY DATA

[illegible]

*Continued*

**TABLE 2-3(2) DESCRIPTION OF ROAD INVENTORY DATA**

Type of Data	Cell Address	Description
14. Subsection Number	A11-Down	Sequential number beginning at 1.
15. Length (km)	B11-Down	Subsection length in km. Subsection length is computed by Excel from stations in columns E and F.
16. Odometer Reading Begin.	C11-Down	Odometer reading at beginning of subsection. Odometer reading will automatically appear if odometer reading ends in column D is entered except in the first section.
17. Odometer Reading End.	D11-Down	Odometer reading at end of subsection
18. Station Beginning and end (Protected cell)	E11 F11 Down	Station is automatically computed by Excel by multiplying odometer reading and adjustment factor.
19. Carriageway Type	G11-Down	<i>Surface Type</i> C : Concrete Pavement A : Asphalt/Bituminous Pavement G : Gravel E : Earth - : Not Existing
20. No. of Carriageway	H11-Down	No. of carriageway divided by median. If median is not present, blank is entered.
21. Width	I11-Down	Width of carriageway in meter
22. Condition	J11-Down	<i>Condition of carriageway</i> G : Good F : Fair B : Bad V : Very Bad I : Impassable U : Underconstruction - : Not existing
23. Median Width	K11	Width of median in m if exists.  No. of Carriageway : 2 Carriageway Width : 6.7 Median : 2.0
24. Shoulder Type	L11-Down	Surface type of shoulder C : Concrete A : Asphalt G : Gravel E : Earth - : None

*Continued*

**TABLE 2-3(3) DESCRIPTION OF ROAD INVENTORY DATA**

Type of Data	Cell Address	Description
25. Shoulder Width	M11-Down	Width of shoulder in meter
26. Sidewalk	N11-Down	Presence of sidewalk W : Sidewalk is present at either side of the road. W/O : Sidewalk is not present at neither side of the road.
26. Terrain	O11	Type of terrain F : Flat R : Rolling M : Mountainous
28. Land Use	P11, Q11-Down	Land use along the road A : Agricultural/Cultivated Land F : Forest/Bush W : Waste/Idle Land P : Pasture S : Swampy Area U : Urbanized Area
29. Substandard Alignment Section	R11-Down  S11-Down	Substandard alignment section in meter (Horizontal).  Substandard alignment section in meter (Vertical).
30. Disaster Potential Section	T11-X11-Down	Length of disaster potential section in meter CS : Cut Slope Failure ES : Embankment Slope Failure DF : Debris Flow SR : Scouring FR : Flooding
31. Survey Method	Y11-Down	Survey Method F : Field Survey H : Hearing Survey
32. Remarks	Z11-Down	Surveyor's note regarding road inventory and condition of the road link.

### 2.2.2 Data Check

Various data check functions are available in columns AA through AR at right side of inventory sheet as shown in Table 2-5. These functions are available only in the first sheet of road inventory data of a file to curtail file size. If data check functions are needed in other sheets, users can copy them from first sheet and paste at desired sheet using **copy-paste** command. Table 2-6 shows type of data checks available and their brief descriptions while detailed description of data check is presented in Appendix 2-1.

Columns AS through BB contain reference data used by functions stored in AA through AR for data check purposes.

Values in column BC are travel times in minutes of each subsection. Travel time shown in cell G6 in inventory data is a summation of travel times in column BC.

Columns AS through BC are usually set as hidden columns and not displayed on the screen at all to maintain neat appearance of inventory sheet.

## 2.3 BRIDGE INVENTORY DATA

### 2.3.1 Bridge Inventory Sheet

Table 2-7 shows a sample of bridge inventory sheet for road link 056-21A in Catanduanes province.

File structure of Excel workbook for bridge inventory data is same as one for road inventory data, i.e. first sheet of a bridge inventory data file is a summary sheet which contains road link number and travel impedance of bridges, expressed in minutes (see Figure 2-8) and succeeding sheets contain bridge inventory data of each road link, if there are 30 road links in a province, there should be 31 sheets including summary sheet in the bridge inventory file.

TABLE 2-5 DATA CHECK SHEET OF ROAD INVENTORY DATA

	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	
1																	Consistency Check													
2																	056													
3																	1													
4																	3													
5																														
6																														
7																														
8																														
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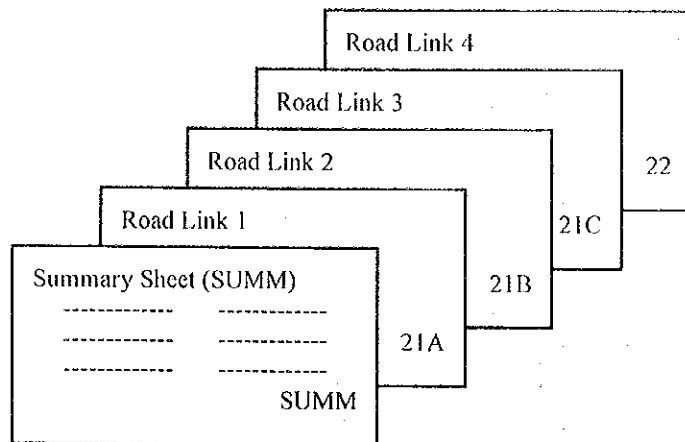
TABLE 2-6 TYPE OF DATA CHECKS IN ROAD INVENTORY FILES

Check Item	Cell Address	Description of Data Check
Road Number	AD2	Check whether first three characters of road number are same as province code.
Road Name	AD3	Check whether road name is entered or not. Check whether road name exceeds 50 characters or not.
Admin. Class	AD4	Check whether administrative classification is pre-specified character or not.
Functional Class	AD5	Check whether functional classification is pre-specified character or not.
A/F	AD6	Check whether adjustment factor of odometer reading is reasonable value or not.
Sign	AD7	Check whether sign is either "+" or "-".
Date	AD8	Check whether survey date is within specified period or not.
Pavement Type	AB11 Down	Check whether pavement type code is pre-specified character or not.
Pavement Condition	AC11 Down	Check whether pavement condition code is pre-specified character or not.
Carriageway Width	AD11 Down	Check whether numerical value is entered or not.
Median Width	AE11 Down	Check whether numerical value is entered or not, if median exists.
Shoulder Type	AF11 Down	Check whether shoulder type code is pre-specified character or not.
Shoulder Width	AG11 Down	Check whether numerical value is entered or not, if shoulder exists.
Side walk	AH11 Down	Check whether presence of sidewalk is "W" or "W/O".
Terrain Type	AI11 Down	Check whether terrain type code is pre-specified character or not.
Land Use (L.R)	AJ11, AK11 Down	Check whether land use code is pre-specified character or not.
Survey Method	AL11 Down	Check whether survey method code is pre-specified character or not.
Road Number	AO4	Check whether road number is consistent with road classification or not.
Road Classification	AO5	Check whether administrative classification and functional classification are consistent with each other.
Pavement Type/Width	AM11 Down	Check whether pavement width is entered for existing road sections or not.
Pavement Type/Condition	AN11 Down	Check whether pavement type is entered for existing road sections.
Median Carriageway	AO11 Down	Check whether median width is entered or not for road section where number of carriageway is more than 2.
Shoulder Width/Type	AP11 Down	Check whether shoulder width is entered or not for road sections where shoulder exists.
Substandard Alignment Section	AQ11 Down	Check whether total substandard alignment length exceeds subsection length or not.
Disaster	AR11 Down	Check whether total length of disaster spots exceeds subsection length or not.



TABLE 2-7 BRIDGE INVENTORY DATA SHEET

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	
1	BRIDGE CONDITION SURVEY SHEET																										
2	Sheet No.: 05627A Road No.: Admin. Road Class: N, P, C Travel Time: 0.00 Road Name: Vinnajit Baid Functional Class: OR Date: 10/11/87																										
3	Section No.	Sub-Section No.	Bridge Name	Odometer Reading Km	Station	Bridge Type	Bridge Length m	Span Length			Width		Bridge Damage			Approach Road Damage			Survey Method	Remarks							
4						P.B.T.S.F.N		X	m	X	m	Carriageway	Side-Walk	Slab	Super-Str	Sub-Str	1st Approach	2nd Approach	F.H								
5								X		X																	
6								X		X																	
7								X		X																	
8								X		X																	
9	A	1	Shibahin	0.50	0.481	P	15.20	1	X	15.20	X	7.40	0.70			M				F							
10	A	3	Kanaban	1.20	1.153	P	8.30	1	X	8.30	X	7.40	0.50			L				F							
11	A	3	Shibahin	1.70	1.634	P	24.00	2	X	12.00	X	6.70	0.50			L				F							
12	A	4	Mamras	2.80	2.691	P	3.00	1	X	3.00	X	7.50	0.50			M				F	damaged deck order						
13	A	6	Bhawanian	4.10	3.940	P	21.00	1	X	21.00	X	7.50	0.80							F							
14	A	7	Cabugao	5.70	5.478	P	5.00	1	X	5.00	X	7.50	0.70							F							
15	A	9	Lunduan	6.30	6.054	P	6.20	1	X	6.20	X	7.50	0.70							F							
16	A	11	Gunobalan	6.80	6.596	P	5.00	1	X	5.00	X	7.40	0.50							F	submerged bridge						



Microsoft Excel - 056road

File Edit View Insert Format Tools Data Window Help

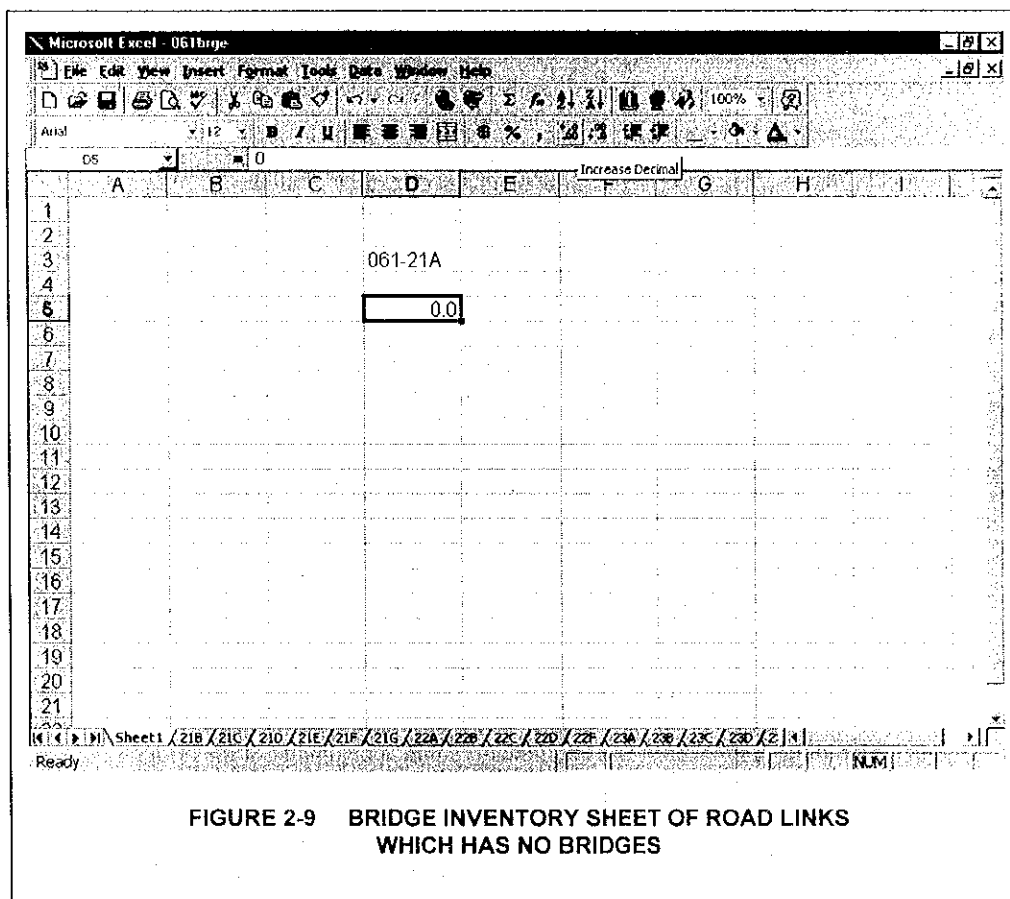
Arial 12

Road Number														
A1														
1	Road Number	Length												
2														
3	056-21A	7.7841												
4	056-21B	3.5557												
5	056-21C	39.401												
6	056-21D	4.9872												
7	056-21E	0.7688												
8	056-21F	4.1323												
9	056-21G	48.1942												
10	056-21H	9.5836												
11	056-21I	11.2632												
12	056-21J	7.0148												
13	056-21K	2.0748												
14	056-21L	48.3132												
15	056-21M	3.458												
16	056-21N	5.8												
17	056-21O	5.75												
18	056-21P	1.4												
19	056-21Q	1.45												
20	056-22A	2.4												
21	056-22B	7.5												
22	056-22C	7.92												
23	056-23	25.4665												
24	056-61	22.2												
25	056-62A	6.7												
26	056-62B	1.2												
27	056-63	17.2												
28	056-64	3.5												
29	056-65	7.2												
30	056-66A	29.82												
31	056-66B	42.18												
32														
33														

Ready

FIGURE 2-8 STRUCTURE OF BRIDGE INVENTORY DATA FILE

Each sheet has its unique sheet name representing road number of the road link. These sheet names of bridge inventory file shall be the same as sheet names in road inventory data. Road links which have no bridge along the road still maintain bridge inventory sheets in the file for the purpose of tabulation and summarization. These files contain only road number in cell D3 and zero value of travel impedance in cell D5.



**FIGURE 2-9 BRIDGE INVENTORY SHEET OF ROAD LINKS WHICH HAS NO BRIDGES**

The Summary Sheet is not linked to other files/sheets to update data in the sheet, hence, update of inventory sheet does not affect the contents of summary sheet. Macro program "Sumbr" creates this summary sheet and place date and time of data update in the sheet to let user know whether summary sheet contains the latest information or not.

Description of each data cell of bridge inventory sheet is presented in Table 2-8. Stations in column E are computed by Excel by referring stations, odometer reading and adjustment factor of Road Inventory Data.

TABLE 2-8(1) DESCRIPTION OF BRIDGE INVENTORY DATA

Type of Data	Cell Address	Description
1. Sheet Number	D2	Sheet number can be any type of letters at discretion of users. It is not part of inventory data. This cell is reserved only for user's convenience.
2. Road Number	D3	Road number of bridge data must be same as road data.
3. Road Name	J3	Road name must be same road inventory data.
4. Administrative Class	D4	Administrative classification of road must be same as one in road data.
5. Functional Class	J4	Functional classification shall be DPWH classification and must be same as one in road inventory data.
6. Date	R4	Survey date
7. Travel Time	D5	Travel time in minutes. Travel time is automatically computed by Excel based on bridge and travel time list in TRAVEL.XLS stored in <b>HIGHWAY</b> directory.
8. Section Number	A9 Down	Last character of road number.
9. Subsection Number	B9 Down	Subsection number of the road section where bridge is located.
10. Bridge Name	C9 Down	Name of bridge used in DPWH.
11. Odometer Reading	D9 Down	Odometer reading at beginning of the bridge.
12. Station (Protected Cell)	E9 Down	Station is automatically computed by Excel by referring stations in Road Inventory Data File.
13. Bridge Type	F9 Down	Either of; P : Permanent B : Bailey T : Timber S : Spillway F : Field Crossing N : No Existing and not passable by ford crossing
14. Bridge Length (Protected Cell)	G9 Down	Bridge length is automatically computed by Excel from number of spans and span length.
15. Span Length	H9-P9 Down	Number of spans and its span length (maximum three types of combination is possible).
16. Carriageway Width	Q9 Down	Width of carriageway in meter

TABLE 2-8(2) DESCRIPTION OF BRIDGE INVENTORY DATA

Type of Data	Cell Address	Description
17. Sidewalk Width	R9 Down	Width of Sidewalk in meter
18. Bridge Damage	S9-U9 Down	Either of; - : No of damage L : Light damage M : Medium damage H : Heavy damage U : Under construction for slab, superstructure and substructure of a bridge.
19. Approach Damage	V9-Y9 Down	Either of; - : No damage L : Light damage M : Medium damage H : Heavy damage U : Under construction
20. Survey Method	Z9 Down	Either of; F : Field H : Hearing
21. Remarks	AA9 Down	Description of bridge damage, or any information essential for highway planning.

### 2.3.2 Data Check

Data check functions of bridge inventory data are also available in columns AB through AM at right side of inventory sheet as shown in Table 2-9. These functions are available only in the first sheet of road inventory data of a file to curtail file size. **Copy-Paste** command may be used to copy check functions to desired sheets as discussed in Section 2.2.2.

Table 2-10 shows type of data checks and their brief descriptions available in these columns. Detailed description of data check is presented in Appendix 2-1.

Columns AN through AU contains reference data used by functions stored in columns AB through AM for data check purposes.

Values in column AV are travel impedance of each bridge expressed in minutes. Lower standard of bridges such as bailey or timber have bigger travel impedance compare with permanent bridges, impassable river crossing has virtually infinite value of travel impedance. These travel impedances will be utilized by traffic analysis programs.

Columns AB through AV are set as hidden columns and not displayed on the screen to maintain neat appearance of inventory sheet.

TABLE 2-9 DATA CHECK SHEET OF BRIDGE INVENTORY DATA

	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	
1	<b>Validity Check</b> 056-21A Road Number Road Name Admin. Class. Funct. Class. Date												<b>Consistency Check</b> Road Number Functional Class.									
2																						
3																						
4																						
5																						
6	Error																					
7	Subsec. No.		Subsec. No.		Slab Damage		Super. Damage		Substruct. Damage		1st Appr. Damage		2nd Appr. Damage		Survey Method		Bridge Type		Approach 1 damage/length		Approach 2 damage/length	
8	A		1																			
9	A		3																			
10	A		3																			
11	A		3																			
12	A		4																			
13	A		6																			
14	A		7																			
15	A		9																			
16	A		11																			

**TABLE 2-10 TYPE OF DATA CHECKS IN BRIDGE INVENTORY FILES**

Check Item	Cell Address	Description of Data Check
Road Number	AE2	Check whether first three characters of road number are same as province code.
Road Name	AE3	Check whether road name is entered or not. Check whether road name exceeds 50 characters or not.
Admin. Class	AE4	Check whether administrative classification is pre-specified character or not.
Functional Class	AE5	Check whether functional classification is pre-specified character or not.
Date	AE6	Check whether survey date is within specified period or not.
Bridge Type	AD9 Down	Check whether bridge type code is pre-specified character or not.
Slab Damage	AE9 Down	Check whether slab damage code is pre-specified character or not.
Superstructure Damage	AF9 Down	Check whether superstructure damage code is pre-specified character or not.
Substructure Damage	AG9 Down	Check whether substructure damage code is pre-specified character or not.
1st Approach Damage	AH9 Down	Check whether 1st approach damage code is pre-specified character or not.
2nd Approach Damage	AI9 Down	Check whether 2nd approach damage code is pre-specified character or not.
Survey Method	AJ9 Down	Check whether survey method code is pre-specified character or not.
Road Number	AM3	Check whether road number is consistent with road classification or not.
Road Classification	AM4	Check whether administrative classification and functional classification are consistent each other.
Bridge Type/Width	AK9 Down	Check whether carriageway width is entered for existing bridge.
1st Approach Damage/ Length	AL9 Down	Check whether approach damage length is entered, if approach damage in cell AH9 is entered.
2nd Approach Damage/ Length	AM9 Down	Check whether approach damage length is entered, if approach damage in cell AI9 is entered.

## 2.4 SUMMARY FILES

Numerous summary sheets are created from road and bridge inventory files for the purpose of analysis. Table 2-11 shows list of summary files and sheets stored in **SUMMARY** directory.

TABLE 2-11 SUMMARY FILES CREATED FROM INVENTORY FILES

File Name	Method Creating Summary Files	Description
Study Area Summaries.xls Sheet	MACRO PROGRAMS	<u>Summary Tables</u>
	• RdPaveTypeARClass	• Road length by pavement type per administrative road classification.
1 : RdPaveTypeARClass	• ArteRdPaveType	• Arterial road length by pavement type.
2 : ArteRdPaveType	• RdLengthFcnClass	• Road length by functional road classification.
3 : RdPaveTypeFcnClass	• NatlRdPaveCond	• National road length by pavement condition.
4 : NatlRdPaveCond	• ProvRdPaveCond	• Surveyed provincial road length by pavement condition.
5 : ProvRdPaveCond		• North-South backbone length by pavement condition.
6 : NSPaveCond	• NSPaveCond	• East-West lateral length by pavement condition
7 : EWPaveCond	• EWPaveCond	• Other roads of strategic importance by pavement condition.
8 : OWPaveCond	• ORPaveCond	• National secondary road length by pavement condition.
9 : SNPaveCond		• Arterial road length by pavement condition.
10 : ArteRdPaveCond	• SNPaveCond	• Road length by pavement condition by road function classification.
11 : RdPaveCondFcnClass	• ArteRdPaveCond	• Road length by number of lanes per road functional classification.
12 : RdNoLanesARClass	• RdPaveCondFcnClass	• Road length by number of lanes per administrative road classification.
13 : RdNoLanesFcnClass	• RdNoLanesFcnClass	• Road length by pavement type by road functional classification.
14 : RdLengthFcnClass	• RdNoLanesARClass	
	• RdPaveTypeFcnClass	<u>Graphs</u>
15 : NatlRdPaveTypeChart		• National Road Length by Pavement Type
15 : ProvRdPaveTypeChart		• Provincial Road Length by Pavement Type
15 : TotalRdPaveTypeChartARClass		• Study Area Total Road Length by Pavement Type
16 : NSRdPaveTypeChart		• Administrative Road Classification
16 : ORRdPaveTypeChart		• North-South Backbone Road Length by Pavement Type
17 : ArteRdPaveTypeChart		• East-West Lateral Road Length by Pavement Type
17 : SNRdPaveTypeChart		• Length of Other Roads of Strategic Importance by Pavement Type
18 : RdLengthFcnClassChart1		• Arterial Road Length by Pavement Type
19 : NatlRdPaveCondChart1		• National Secondary Road Length by Pavement Type
19 : NatlRdPaveCondChart2		• Study Area Total Road Length by Pavement Type
19 : NatlRdPaveCondChart3		• Road Lengths by Road Functional Classification
20 : ProvRdPaveCondChart1		• National Road Pavement Condition
20 : ProvRdPaveCondChart1		• Provincial Road Pavement Condition
20 : ProvRdPaveCondChart2		• North-South Backbone Road Pavement Condition
20 : ProvRdPaveCondChart3		• East-West Lateral Road Pavement Condition
21 : NSRdPaveCondChart		• Other Roads of Strategic Importance Pavement Condition
21 : EWRdPaveCondChart		• Arterial Roads Pavement Condition
21 : ORRdPaveCondChart		• National Secondary Road Pavement Condition
22 : ArteRdPaveCondChart		• Number of Lanes for National Roads
22 : SNRdPaveCondChart		• Number of Lanes for Provincial Roads
23 : NatlRdNoLanesChart		• Number of Lanes for North-South Backbone Roads
24 : ProvRdNoLanesChart		• Number of Lanes for East-West Lateral Roads
24 : NSRdNoLanesChart		• Number of Lanes for Other Roads of Strategic Importance
25 : EWRdNoLanesChart		• Number of Lanes for National Secondary Roads
25 : ORRdNoLanesChart		
25 : SNRdNoLanesChart		



#### 2.4.1 Study\_Area\_Summaries.xls

Study\_Area\_Summaries.xls consists of 25 sheets. Sheet 1 through 14 contain summary tables constructed from Road and Bridge Inventory data by Macro programs while sheets 15 to 25 stores graphs of the summary tables in sheets 1 to 14 for graphical presentation. For example, sheet 1 with a name of "RdpaveTypeARclass" contains a summary table of road length per province by surface type and administrative road classification, sheet 2 with a name of "ArteRdPaveType" is a summary table of road length per province by surface type and functional classification.

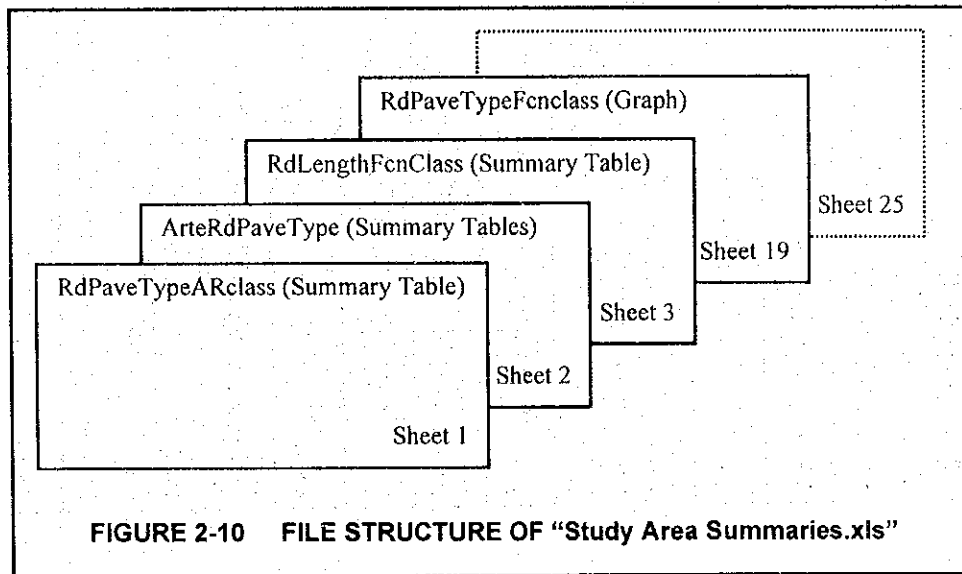


Figure 2-11 shows sample print-out of sheet-1 for summary table of road length by administrative classification and sheet-16 for pavement type graph.

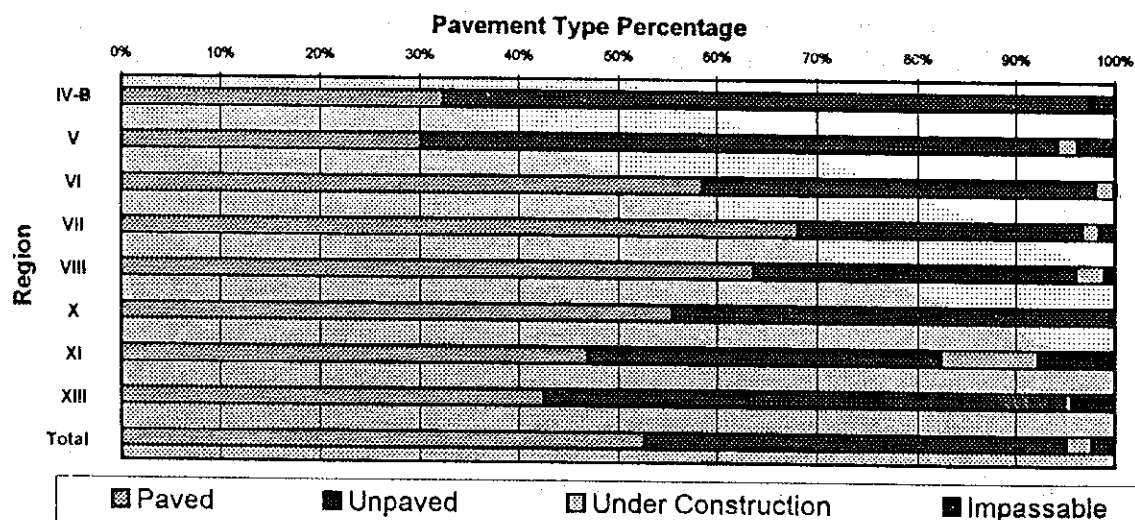
Summary tables in the file are created by Macro programs. A macro is a series of commands and functions that can be run whenever the user wishes to perform a certain task. For menial task, repetitive commands may be "recorded" and then played back by the user as often as he likes. However, for more complex procedures and data processing, the macros have to be edited in the Visual Basic Editor of Microsoft Excel '97.

Excel macros are stored in Visual Basic modules and recognizes the Visual Basic programming language. To be able to write programs in this environment, one must have sufficient knowledge in the operation of Microsoft Excel and preferably an extensive computer programming background.

Needless to say, an Excel macro is the most effective tool, probably the only one which can deliver the requirements of the end-user when using the MS Excel format for the database. It is more flexible than most of the available database software in the market today since the user can always take control of the final output, from the way it looks up to most minute detail of the end product. It is also "smart" in a way, since the user can also make the macro compare data and then make decisions on which one will be used, where to put it, how it will look, and so on.

**Master Plan Study on Visayas and Mindanao Islands**  
**Strategic Road Network Development Project**  
**Road Length Summary by Pavement Type per Administrative Road Classification**

Region	Province	National Road				Provincial Road				Total			
		Paved	Unpaved	U/C	Impassable	Paved	Unpaved	U/C	Impassable	Paved	Unpaved	U/C	Impassable
IV-B	Mindoro	59.69	109.88	2.34	0.00	271.96	0.00	0.00	0.00	0.00	0.00	2.34	0.00
	Occidental Mindoro	29.92	235.15	1.94	0.00	297.99	21.52	0.00	0.00	517.88	514.65	1.94	0.00
	Oriental Mindoro	154.16	128.57	0.76	0.00	292.92	34.31	0.00	0.00	116.21	188.47	0.00	0.00
	Palawan	210.90	422.33	0.00	0.00	663.23	0.00	103.02	0.00	38.34	210.90	0.00	0.00
	Sub-total	584.77	885.93	2.70	0.00	1733.14	35.83	103.02	0.00	524.44	824.98	2.70	0.00
V	Calabugan	47.22	203.44	2.36	0.00	248.03	8.70	120.60	1.20	0.00	130.00	0.00	0.00
	Marikina	121.33	145.24	8.73	0.00	255.70	4.30	18.16	0.00	25.78	126.33	0.00	0.00
	Sub-total	168.55	348.68	11.10	0.00	503.73	13.00	138.76	1.20	25.78	256.33	0.00	0.00
	Alilan	102.26	40.67	0.00	0.00	143.98	18.75	93.39	0.00	112.15	121.01	0.00	0.00
	Aringay	139.72	192.11	0.00	0.00	331.83	1.29	15.25	0.00	16.94	141.30	0.00	0.00
VI	Cajupit	204.79	113.97	1.96	0.00	325.71	14.74	60.70	3.36	0.00	78.90	0.00	0.00
	Isi	495.75	309.79	8.82	0.00	813.86	47.40	77.77	3.73	7.46	136.31	543.15	387.01
	San Carlos	47.87	81.82	0.00	0.00	129.64	7.61	44.13	0.00	51.64	55.33	125.96	0.00
	San Carlos Occidental	544.05	333.93	19.50	0.00	937.43	50.82	85.57	0.00	135.85	614.64	419.44	0.00
	Sub-total	1687.79	1073.14	30.28	0.00	2713.84	140.86	268.76	7.09	7.46	632.66	1728.88	1446.80
VII	San Carlos	275.78	216.34	8.98	25.18	586.27	10.77	141.42	3.67	0.00	156.16	417.78	12.95
	Cebu	461.02	172.98	5.67	1.06	640.75	99.25	130.23	1.40	25.73	507.61	568.77	303.71
	San Carlos Occidental	134.92	35.71	10.69	0.00	180.82	31.84	132.53	1.19	0.00	185.58	366.60	187.72
	San Carlos	71.34	0.29	3.49	0.00	75.13	10.52	25.17	0.00	0.00	35.70	81.87	25.46
	Sub-total	1149.06	484.82	28.83	26.24	1889.97	162.73	449.83	6.26	25.73	864.84	1501.79	534.86
VIII	Luzon	527.23	319.44	28.97	13.16	869.12	24.40	76.06	0.00	27.69	128.15	551.93	395.50
	San Carlos	141.36	71.83	27.55	0.00	240.74	2.90	22.54	0.00	0.00	25.24	144.79	94.17
	San Carlos	31.72	56.30	2.46	0.44	137.91	0.00	0.00	0.00	0.00	31.72	96.50	2.46
	San Carlos	199.35	107.41	0.00	0.00	306.76	1.72	9.43	0.00	0.00	11.15	201.66	115.94
	Sub-total	1256.64	554.98	39.00	13.60	1554.53	39.02	108.43	0.00	27.69	176.84	900.80	574.41
IX	San Carlos	126.61	24.82	0.00	0.00	151.43	15.84	31.44	0.00	1.67	124.82	128.84	0.00
	San Carlos	126.61	24.82	0.00	0.00	151.43	15.84	31.44	0.00	1.67	124.82	128.84	0.00
	San Carlos	126.61	24.82	0.00	0.00	151.43	15.84	31.44	0.00	1.67	124.82	128.84	0.00
	San Carlos	126.61	24.82	0.00	0.00	151.43	15.84	31.44	0.00	1.67	124.82	128.84	0.00
	Sub-total	126.61	24.82	0.00	0.00	151.43	15.84	31.44	0.00	1.67	124.82	128.84	0.00
X	San Carlos	178.97	455.52	1.73	2.31	636.02	1.54	163.62	0.00	0.00	170.18	118.52	0.00
	San Carlos	50.04	13.86	0.00	0.00	64.00	8.17	28.58	0.00	14.85	58.21	43.52	0.00
	San Carlos	168.05	38.57	0.00	0.00	206.62	5.89	36.51	0.00	0.00	102.81	175.54	135.24
	San Carlos	226.08	51.30	0.86	0.00	277.24	18.42	180.14	0.41	16.91	218.89	325.50	232.44
	Sub-total	702.74	649.10	2.59	2.31	1004.38	36.08	486.24	0.41	31.76	441.43	737.18	603.34
XI	San Carlos	233.66	114.66	3.78	0.00	352.11	4.07	304.48	0.00	30.44	319.89	238.04	419.14
	San Carlos	83.90	125.15	27.15	78.33	312.52	18.96	34.95	0.00	6.25	80.17	102.86	160.11
	San Carlos	99.58	241.23	3.69	0.00	344.50	0.00	49.00	0.00	0.00	49.00	99.58	241.23
	San Carlos	158.41	35.47	18.35	11.28	213.51	1.95	35.56	0.00	37.93	160.36	71.44	18.35
	Sub-total	133.66	85.24	38.69	47.85	280.44	2.20	19.66	0.00	17.58	89.89	152.66	274.90
XII	San Carlos	87.48	20.61	78.00	0.00	186.08	18.82	107.77	3.50	9.16	134.37	106.30	213.58
	San Carlos	796.68	607.36	199.98	130.43	1808.16	46.81	686.83	13.86	63.46	711.04	843.80	1180.18
	San Carlos	153.11	62.26	1.57	26.66	243.55	12.19	56.60	0.00	19.57	88.30	155.29	119.86
	San Carlos	185.80	127.95	0.00	0.00	313.75	2.87	213.12	0.00	38.68	188.87	265.15	8.46
	Sub-total	99.81	56.12	2.09	4.78	152.79	14.71	52.83	2.95	18.99	100.48	104.52	118.95
XIII	San Carlos	55.46	343.29	4.05	19.66	419.41	0.00	36.12	0.00	4.71	41.83	55.46	343.29
	San Carlos	474.18	586.47	7.87	46.07	1116.58	29.78	397.87	11.41	83.90	822.94	863.34	19.07
	San Carlos	55.46	343.29	4.05	19.66	419.41	0.00	36.12	0.00	4.71	41.83	55.46	343.29
	San Carlos	474.18	586.47	7.87	46.07	1116.58	29.78	397.87	11.41	83.90	822.94	863.34	19.07
	Sub-total	579.64	5444.76	334.18	229.12	12798.94	529.48	3674.66	22.86	371.88	4475.84	7258.43	8519.57
Grand Total		8779.94	5444.76	334.18	229.12	12798.94	529.48	3674.66	22.86	371.88	4475.84	7258.43	8519.57

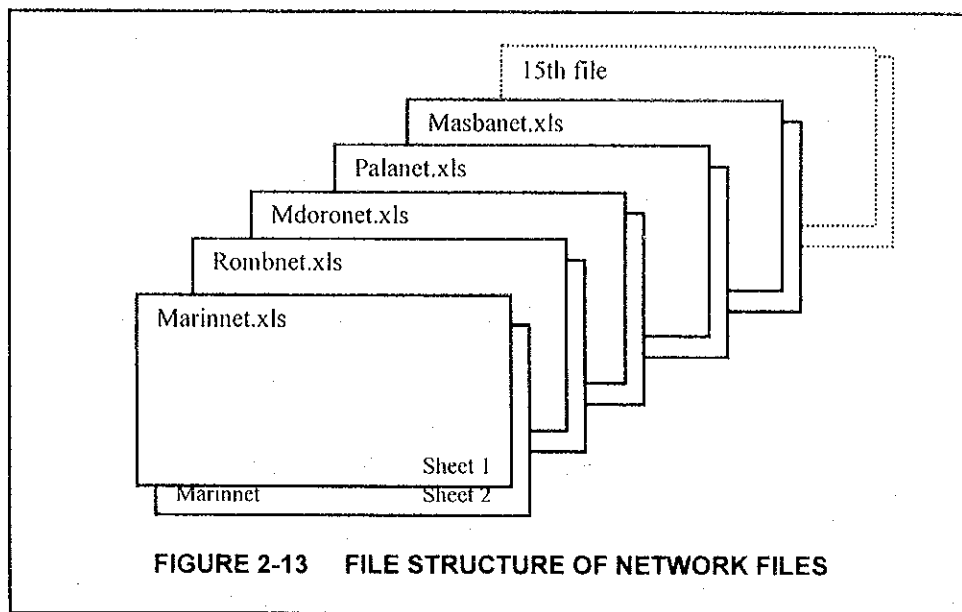


**FIGURE 2-11 SAMPLE OF SUMMARY SHEET AND GRAPHS**  
**CREATED BY MACRO PROGRAMS**

The contents of the sheet will be automatically updated by the Macro program.



Table 2-12 shows a sheet named "*Rombnet*" in *Rombnet.xls* for Romblon Island which will later be converted to a text file format of road network for traffic analysis. Road numbers, link length and travel times of *Rombnet.xls* are directly taken from summary sheets of each road and bridge inventory file while node numbers are manually entered. Shaded cells of the sheet are truncated and stored in a sheet named "*sheet 1*" in the same workbook and then converted into a text file for the use of traffic analysis programs.



Column width, location of decimal points of numerical data, and text alignment of *Sheet 1* are adjusted to fit the file format specified by FORTRAN programs of traffic analysis models. Network files for traffic analysis models will be created from *Sheet 1* by saving the file as "space delimited text file".

## 2.6 TRAVEL.XLS

Figure 2-14 shows contents of Travel.xls which is stored in **HIGHWAY** directory. This file supplies vital information to inventory files for computation of travel times.

Travel.xls file contains average travel speed expressed in km/hr of a road by surface type and condition. It also stores travel impedance expressed in hours by bridge type. Functions stored in inventory files refer to this travel speed table for computation of travel time of each link and travel impedance of bridges. Travel speed for concrete or asphalt in good condition is assumed to be 65 km/hr. and travel speed for earth in very bad condition is 10 km/hr. while travel speed of impassable section is set as 0.001 km/hr. which is in effect zero travel speed.

Travel impedance of permanent bridge is set as zero and bailey, timber and spillway is 0.009 hour while river without bridge and unable to make ford crossing is set as 1000 hours which is virtually infinite period of time to cross the river.

TABLE 2-12 SAMPLE OF NETWORK FILE

Name				Time	Length	Time road	Time br.	
4B5-21A	1410	1408	1	2.36	2.16	2.36	0.00	4B5-21A
4B5-21B	1408	1401	1	31.81	14.50	31.27	0.54	4B5-21B
4B5-21C	1401	19	1	2.75	1.42	2.75	0.00	4B5-21C
4B5-21D	19	1402	1	4.08	3.38	4.08	0.00	4B5-21D
4B5-21E	1402	1403	1	19.84	15.14	19.84	0.00	4B5-21E
4B5-21F	1403	1404	1	18.33	9.16	18.33	0.00	4B5-21F
4B5-21G	1404	21	1	10.24	6.27	9.70	0.54	4B5-21G
4B5-21H	21	1405	1	10.51	5.83	9.97	0.54	4B5-21H
4B5-21I	1405	1412	1	31.69	15.29	20.61	1.08	4B5-21I
4B5-21J	1412	1413	1	4.62	2.70	4.08	0.54	4B5-21J
4B5-21K	1413	1415	1	14.27	9.16	13.73	0.54	4B5-21K
4B5-21L	1415	1416	1	14.54	7.25	13.46	1.08	4B5-21L
4B5-21M	1416	1420	1	4.00	2.16	4.00	0.00	4B5-21M
4B5-21N	1420	1417	1	4.70	2.35	4.70	0.00	4B5-21N
4B5-21O	1417	20	1	8.95	4.90	8.95	0.00	4B5-21O
4B5-21P	20	1411	1	28.43	15.14	28.43	0.00	4B5-21P
4B5-21Q	1411	1410	1	18.62	8.28	18.62	0.00	4B5-21Q
4B5-22A	20	1414	1	32.64	13.92	31.56	1.08	4B5-22A
4B5-22B	1414	1410	1	17.16	9.02	15.54	1.62	4B5-22B
4B5-23			1	14.31	6.17	14.31	0.00	4B5-23
4B5-24			1	17.40	5.80	17.40	0.00	4B5-24
4B5-25A	1401	1407	1	7.74	3.87	7.74	0.00	4B5-25A
4B5-25B	1407	1406	1	10.50	3.50	10.50	0.00	4B5-25B
4B5-26			1	12009.75	3.33	9.75	12000.00	4B5-26
4B5-27	1418	1417	1	7.84	3.23	7.84	0.00	4B5-27
4B5-28			1	1.37	0.69	1.37	0.00	4B5-28
4B5-29A			1	1.27	0.64	1.27	0.00	4B5-29A
4B5-29B			1	3.24	2.21	3.24	0.00	4B5-29B
4B5-30	1406	1405	1	24.65	8.33	24.65	0.00	4B5-30
4B5-40A	22	1409	1	34.26	9.14	33.72	0.54	4B5-40A
4B5-40B	1409	1421	1	32.59	10.25	29.35	3.24	4B5-40B
4B5-45A	24	1426	1	7.74	3.97	7.74	0.00	4B5-45A
4B5-45B	1426	25	1	12026.42	13.04	24.26	12002.16	4B5-45B
4B5-45C	25	1425	1	0.81	0.74	0.81	0.00	4B5-45C
4B5-46A	1423	23	1	24.36	10.76	23.28	1.08	4B5-46A
4B5-46B	23	1422	1	9.12	5.17	8.58	0.54	4B5-46B
4B5-46C	1422	1427	1	18058.28	20.50	48.02	18010.26	4B5-46C
4B5-46D	1427	24	1	28.29	14.37	26.13	2.16	4B5-46D
4B5-61A	1418	1419	1	24.98	10.29	24.44	0.54	4B5-61A
4B5-61B	1419	1420	1	64.45	17.05	62.29	2.16	4B5-61B
4B5-62A	1425	1424	1	19.46	12.05	18.92	0.54	4B5-62A
4B5-62B	1424	1423	1	26.79	12.65	25.17	1.62	4B5-62B

Microsoft Excel: Travel

File Edit View Insert Format Tools Data Window Help

100% 2

Arial 10

	A	B	C	D	E	F	G	H	I	J	K	L
1		C	A	G	E	F						
2	G	65	65	50	20	0.001						
3	F	55	55	50	20	0.001						
4	B	30	30	30	20	0.001						
5	V	20	20	20	10	0.001						
6	I	0.01	0.01	0.01	0.01	0.001						
7	U	65	65	50	20	ERROR						
8		0.001	0.001	0.001	0.001	0.001						
9												
10												
11		P	B	T	S	F	N					
12		0	0.009	0.009	0.009	100	1000					
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												

Ready

FIGURE 2-14 TRAVEL.XLS

## 2.7 FILE LINKAGES

Users of Road Inventory Database should be cautious in changing names and location of files and directories since files in the database are inter-linked each other to exchange data as shown in Figure 2-15.

If users change names and location of files and directories without proper process, links may be cut off and data in linking files will not be updated automatically anymore.

Whenever file with cut-off links is opened and click **Yes** for automatic link, Excel will display a message that link saved in the file is invalid and prompts you to enter location of file to be linked (see Figure 2-16.) If user can specify correct location and name of a file to be linked, data of the opening file will be updated, if user fails to specify the location and name of a file, the file is not opened.

Table 2-13 shows description of file linkages.

**TABLE 2-13 FILE LINKAGES AND DATA REFERENCE**

<b>File Referring</b>	<b>File to be Referred</b>	<b>Data to be Referred</b>
Road Inventory Sheets in ***ROAD.XLS	Travel.xls	Travel speed by surface type and surface condition.
Bridge Inventory Sheets in ***BRGE.XLS	Travel.xls	Travel impedance by bridge type.
Bridge Inventory sheets in ***BRGE.XLS	Road Inventory sheets in ***ROAD.XLS	Station and odometer reading at beginning of a road link and adjustment factor of odometer reading.
Network sheet in *** NET.XLS	Summary sheets of road and bridge inventory files in an island	Road number, link length, and travel time in survey sheets of road inventory files and link number and travel impedance in summary sheets in bridge inventory files.

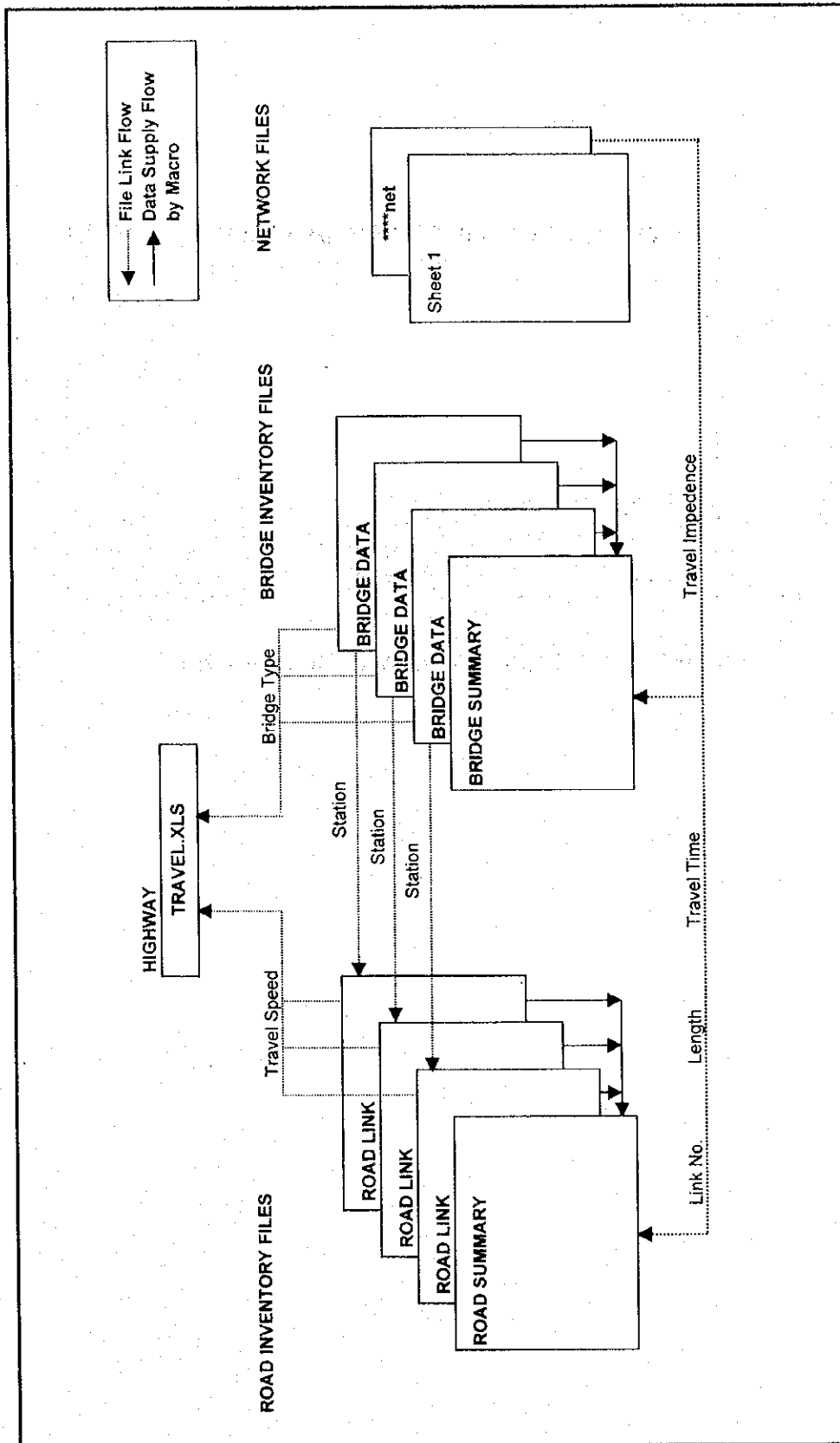


FIGURE 2-15 FILE LINKAGES BETWEEN INVENTORY FILES

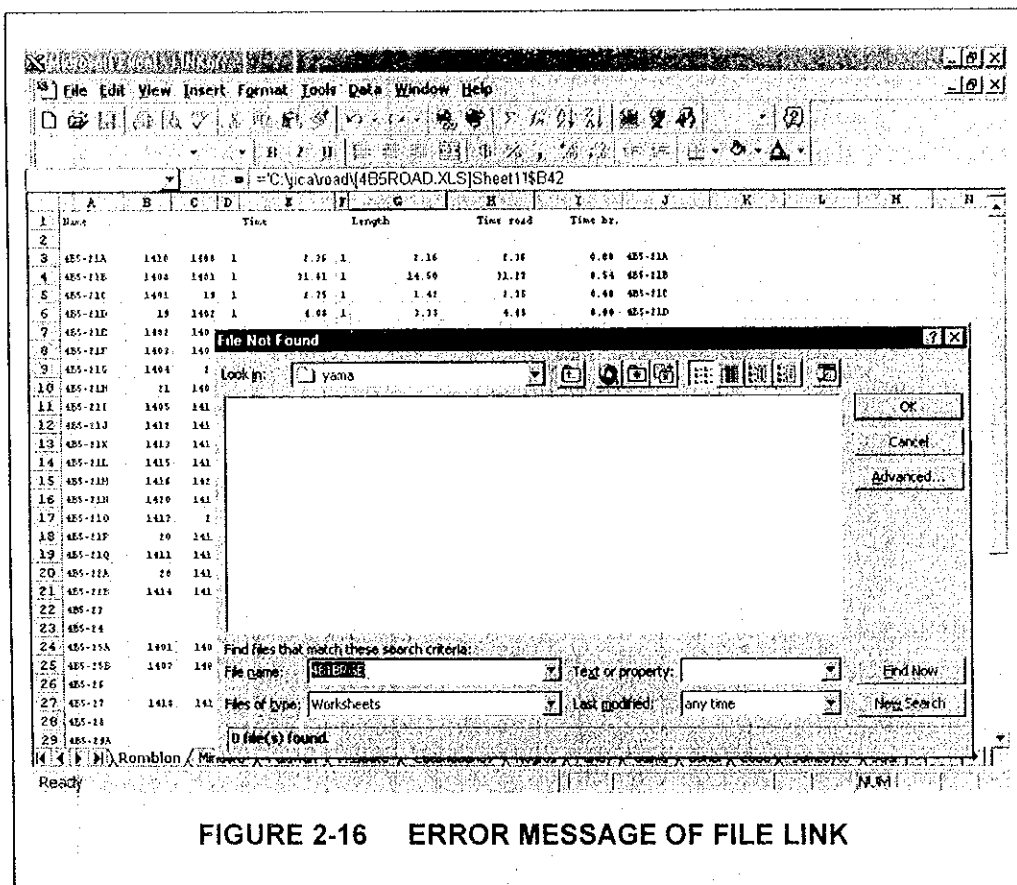


FIGURE 2-16 ERROR MESSAGE OF FILE LINK



### 3. TRAFFIC DATABASE

#### 3.1 DATA STRUCTURE

Traffic data in **TRAFFIC** directory stored in four separate subdirectories such as OD SURVEY, TCOUNT, TRA-ANA and SEA-AIR. Figure 3-1 shows directory tree of TRAFFIC directory.

Subdirectory **ODSURVEY** contains vehicle OD survey data in **VEHICLE** directory and passenger OD survey data in **PASSENGER** directory. Each directory has 80 (2 directions @ 40 survey stations) OD survey data files with Dbase format and corresponding 80 data files with space delimited text format.

Subdirectory **TCOUNT** stores traffic count data of 77 traffic count stations in the study area with Excel format.

Subdirectory **TRAF-ANA** stores traffic analysis programs in **PROGRAM** subdirectory, present OD tables including relevant data such as traffic zone data, present road network data and traffic count data are in **PRESENT** subdirectory, future OD tables including future traffic volume, future socio-economic data and future network data are in **FUTURE** subdirectory.

Subdirectory **SEA-AIR** stores sea and air transport OD data with text file format.

Data files stored in **TRAFFIC** directory are basically text file format for processing by FORTRAN programs..

#### 3.2 OD SURVEY DATA (ODSURVEY)

This directory stores raw data of OD survey results at 40 OD survey stations in the study area in Dbase format and text file format. The files with Dbase format are created upon encoding survey data into a computer, while files with text format are later converted from Dbase files for succeeding analysis by FORTRAN programs.

Each survey station has the following four survey data files;

- Vehicle OD survey data for direction 1
- Vehicle OD survey data for direction 2
- Passenger OD survey data for direction 1
- Passenger OD survey data for direction 2

Therefore, there are 160 OD files in Dbase format and another 160 OD survey files in text format. Subdirectory **VEHICLE** keeps vehicle OD survey files while subdirectory **PASSENGER** keeps passenger OD survey files.

OD files stored in this directory contains raw data obtained from field survey and data inconsistencies which hamper succeeding analysis have not yet been corrected. OD data files modified for traffic analysis are stored in **PRESENT** directory.

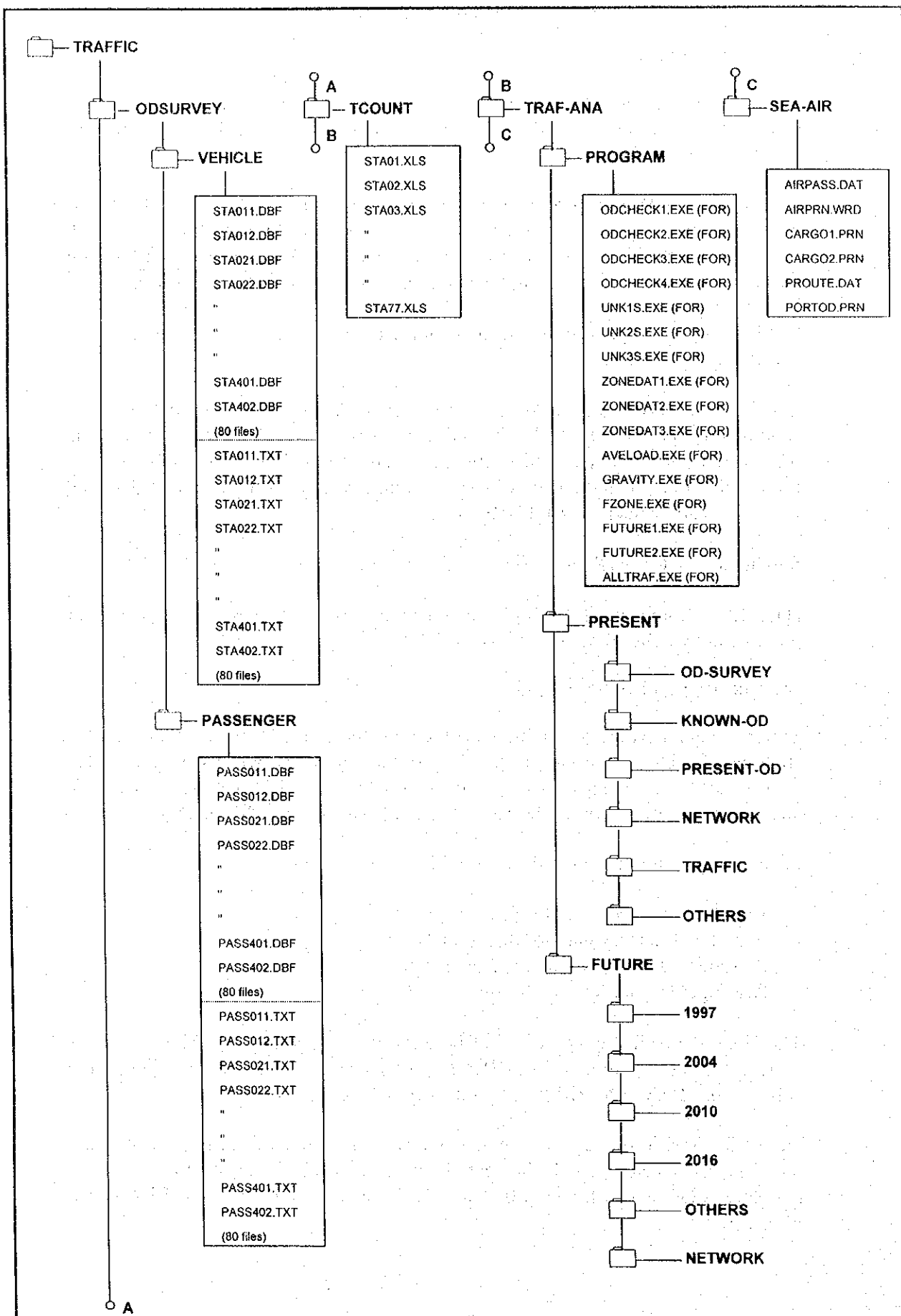


FIGURE 3-1 DATA STRUCTURE OF TRAFFIC DIRECTORY

### 3.3 TRAFFIC COUNT DATA FILES (TCOUNT)

Traffic count data at 77 counting stations conducted by the study team is stored in **TCOUNT** directory with Excel file format. One Excel file contains traffic count data of one station with 5 separate sheets. 1st and 2nd sheet keeps actual manual counting data of 1st and 2nd survey day while 3rd and 4th sheets have tabulated AADT data with expansion, daily and seasonal factors for direction 1 and 2. The last sheet in the file holds AADT data of both directions.

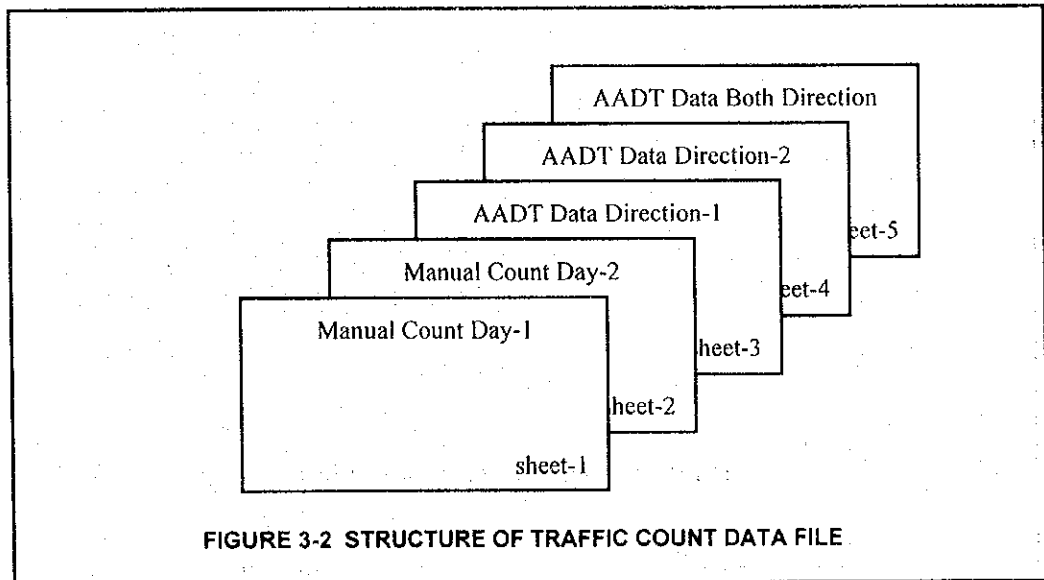


Table 3-1 shows sample of traffic count data sheets. The sheet 3 is linked to sheet 1 to obtain 12-hour traffic count result by vehicle type of first survey day while sheet 4 is linked to sheet 2 to obtain same data in second survey day. Sheet 5 is linked to sheet 3 and 4 to derive AADT in both direction.

Sheet-1

TRAFFIC COUNT SUMMARY I

Sheet-5

**Day** : Monday and Tuesday

Location: Brgy. Sta. Rita, San Joaquin, Antique								
Vehicle Type	Day	12 Hr. COUNT	24 Hr. ADJT.	24 Hr. EXPANDED	Daily Factor	ADJT.	Seasonal Factor	ADJT.
Car/Taxi/Jeep	1	166	1.11	184	0.91	178		
	2	187	1.11	208	1.22	233	1.10	256
Pick-Up/Van/ (Cargo Jeepney)	1	234	1.11	260	0.91	247		
	2	275	1.11	305	1.12	373	1.10	410
Jeepney	1	227	1.14	258	1.06	259		
	2	191	1.24	237	0.96	227	0.96	219
Mini Bus	1	15	2.00	30	1.10	33		
	2	14	2.00	28	0.52	15	24	0.96
Large Bus	1	107	1.41	151	1.06	160		
	2	122	1.41	172	1.03	177	1.04	187
Truck 3-Axle	1	138	1.06	146	1.29	189		
	2	147	1.06	156	0.72	112	1.50	0.94
Truck 3-Axle	1	25	1.06	27	1.29	34		
	2	17	1.06	18	0.72	13	24	0.00
Truck 4 or more Axle	1	0	0.00	0	0.00	0		
	2	1	1.13	1	0.87	1	0	2.00
SUB-TOTAL (AADT1)	1	812		1078		1134		
	2	834		1123		1131	1.133	1283
Motor Tricycle	1	47	1.07	50	1.03	52		
	2	41	1.07	43	1.32	58	55	1.15
Motorcycle	1	82	1.07	88	1.03	90		
	2	82	1.07	88	1.32	116	103	1.15
Special	1	4	1.07	4	1.03	4		
	2	0	0.00	0	0.00	0	2	1.15
TOTAL (AADT2)	1	1063		1221		1283		
	2	1077		1236		1345	1.054	1418

**Note:** Total 1 = excluding motorcycle/micycle  
Total 2 = including motorcycle/micycle

### 3.4 TRAFFIC ANALYSIS PROGRAMS AND FILES (TRAF-ANA))

#### 3.4.1 Programs (PROGRAM)

Table 3-2 presents lists of programs used for traffic analysis in this study together with their brief descriptions. Detailed description of each program is presented in Appendix 3-1.

Two types of program files are available in **PROGRAM** directory, source program files written in FORTRAN language with file extension name of FOR and executable files compiled by FORTRAN Power Station with file extension name of EXE. Traffic engineers who are familiar with FORTRAN programming can revise or update these programs by rewriting source programs.

Figure 3-3 shows overall flow of traffic analysis procedures adopted in this study.

Detailed explanation of methodologies adopted by the traffic analysis programs are beyond this manual. Users interested in logic utilized by these programs are advised to read Main Text of Final Report of the Study.

#### 3.4.2 Data Files for Present Traffic (PRESENT)

This directory contains data files for present traffic analysis such as OD survey data, network data, traffic count data and present OD files.

Figure 3-4 shows data structure of **PRESENT** directory. This directory has the following five subdirectories:

- OD-SURVEY
- KNOWN-OD
- PRESENT-OD
- NETWORK
- TRAFFIC
- OTHERS

Subdirectory **OD-SURVEY** stores OD survey data modified by OD check programs by removing or correcting inconsistent data of raw OD survey data. Therefore, survey data in this directory has bit different contents from OD survey data in **ODSURVEY** directory.

Subdirectory **KNOWN-OD** contains present Known OD tables for islands where OD survey was carried out. Known OD tables are OD data compiled from roadside OD survey.

Subdirectory **PRESENT-OD** has present Known and Unknown OD tables for all islands in the study area. Unknown OD tables are OD data which could not be determined from OD survey but could be estimated from traffic count data.

Subdirectory **NETWORK** keeps network files of each island which contains link and node numbers link length and travel time of each link.

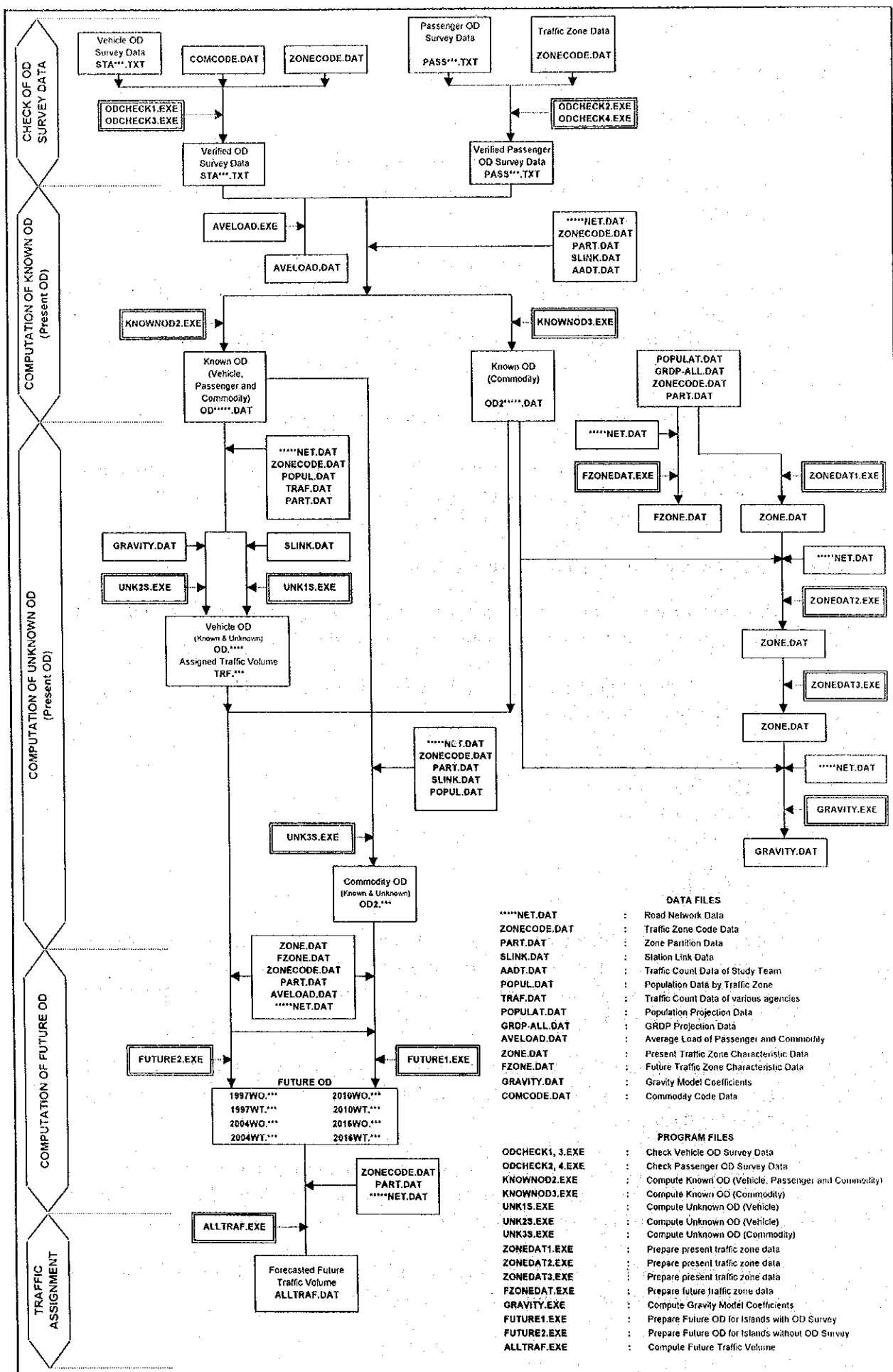


FIGURE 3-3 OVERALL FLOW OF TRAFFIC ANALYSIS

Subdirectory **TRAFFIC** holds traffic volumes calibrated from present OD tables. Observed traffic volumes obtained through traffic count survey are also stored in the files for comparison and verification purposes of calibrated traffics

**TABLE 3-2 PROGRAMS UTILIZED TRAFFIC ANALYSIS**

Program Name	Description
1. ODCHECK1.EXE (FOR)	: Check validity and consistency of vehicle OD survey data
2. ODCHECK2.EXE (FOR)	: Check validity and consistency of passenger OD survey data
3. ODCHECK3.EXE (FOR)	: Check vehicle OD pairs whether they pass survey stations or not
4. ODCHECK4.EXE (FOR)	: Check passenger OD pairs whether they pass survey stations or not
5. KNOWNOD2.EXE (FOR)	: Determine Known vehicle, passenger and commodity OD values from OD survey data.
6. KNOWNOD3.EXE (FOR)	: Determine Known commodity OD values from OD survey data.
7. UNK1S.EXE (FOR)	: Determine Unknown vehicle OD values for islands with OD survey.
8. UNK2S.EXE (FOR)	: Determine Unknown vehicle OD values for islands without OD survey.
9. UNK3S.EXE (FOR)	: Determine Unknown passenger and commodity OD values for islands with OD survey.
10. ZONEDAT1.EXE (FOR)	: Construct present traffic zone characteristic table regarding population and GRDP.
11. ZONEDAT2.EXE (FOR)	: Update traffic zone characteristic table constructed by ZONEDAT1 by adding traffic generation and attraction in each zone.
12. ZONEDAT3.EXE (FOR)	: Add per capita GRDP, trip rate and traffic attraction per person to ZONE.DAT updated by ZONEDAT2.EXE.
13. FZONEDAT.EXE (FOR)	: Prepare future socio-economic data such as population, GRDP and road condition factor of each traffic zone for with and without cases.
14. AVELOAD.EXE (FOR)	: Compute average load of passengers and commodities by vehicle type of each OD survey station.
15. GRAVITY.EXE (FOR)	: Compute gravity model coefficients based on Known ODs derived from OD survey.
16. FUTURE1.EXE (FOR)	: Prepare future vehicle, passenger and commodity OD tables based on present OD data and future socio-economic data for islands with OD survey.
17. FUTURE2.EXE (FOR)	: Prepare future vehicle OD tables based on present OD data and future socio-economic data for islands without OD survey.
18. ALLTRAF.EXE (FOR)	: Compute future traffic volume for with and without case using future OD.

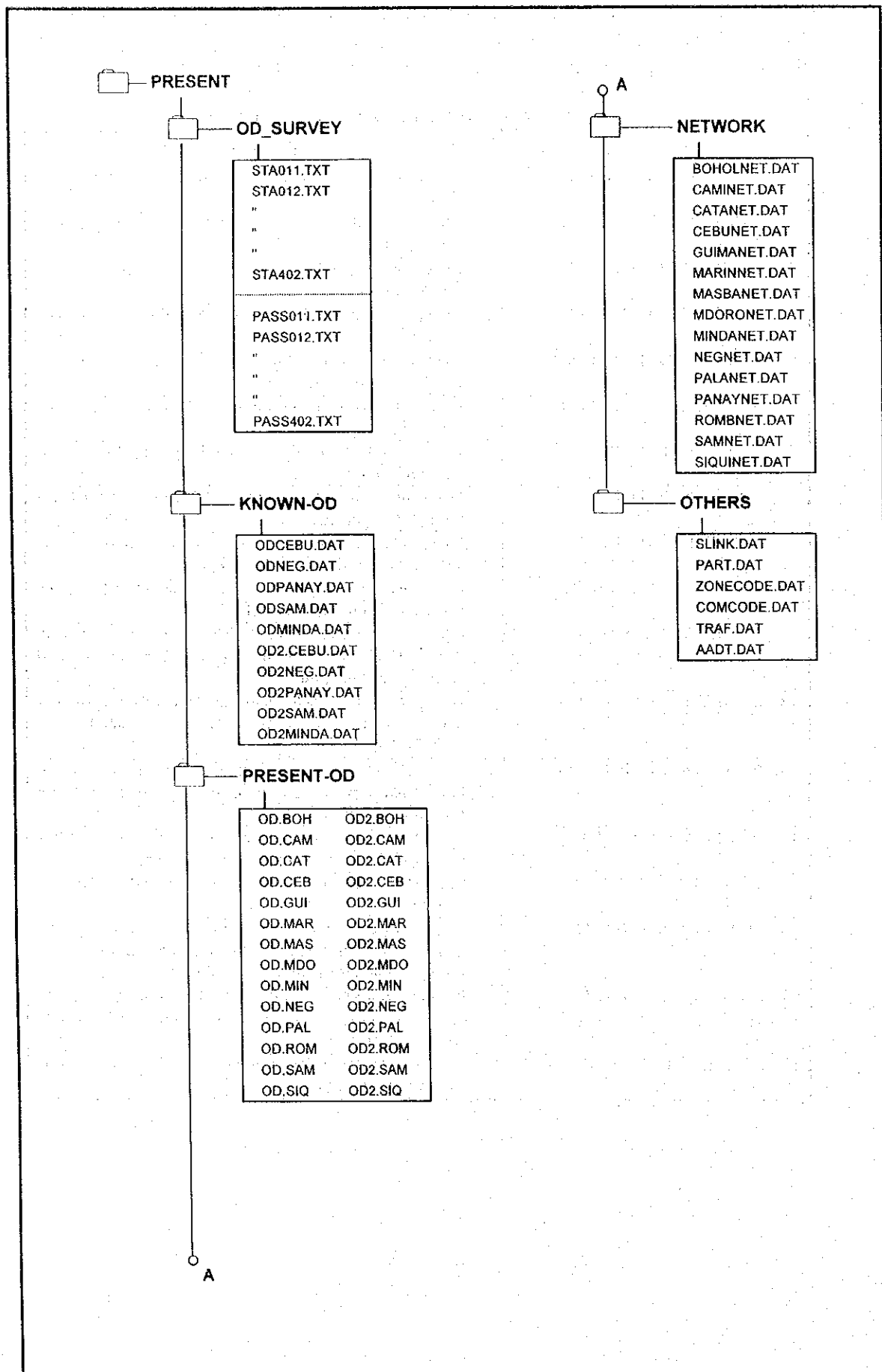


FIGURE 3-4 DATA STRUCTURE OF PRESENT DIRECTORY



Subdirectory **OTHERS** contains other data files like traffic count data, zone code data, survey station link data, population data, etc.

Table 3-3 presents list of data files stored in **PRESENT** directory together with their brief descriptions.

**TABLE 3-3 DATA FILES IN PRESENT DIRECTORY**

Filename	Description
<u>OD-SURVEY Directory</u> <ul style="list-style-type: none"> <li>• STA***.TXT (80 files)</li> <li>• PASS***.TXT (80 files)</li> </ul>	<p>Vehicle OD survey data of each OD survey station after correcting data inconsistencies by OD check programs.</p> <p>Passenger OD survey data of each OD survey stations after correcting data inconsistencies by OD check programs</p>
<u>KNOWN-OD Directory</u> <ul style="list-style-type: none"> <li>• OD*****.DAT (5 files)</li> <li>• OD2*****.DAT (5 files)</li> </ul>	<p>Known OD tables by vehicle, passenger and commodities prepared from OD survey data for islands with OD survey.</p> <p>Known commodity OD tables prepared from OD survey data for islands with OD survey.</p>
<u>PRESENT-OD Directory</u> <ul style="list-style-type: none"> <li>• OD.*** (15 files)</li> <li>• OD2.*** (5 files)</li> </ul>	<p>Present vehicle OD table for Known and Unknown OD pairs in all islands in the study area.</p> <p>Present vehicle, passenger and commodity OD table for Known and Unknown OD pairs in all islands.</p>
<u>NETWORK Directory</u> <ul style="list-style-type: none"> <li>• *****NET.DAT (15 files)</li> </ul>	<p>Present load network data of each islands.</p>
<u>TRAFFIC Directory</u> <ul style="list-style-type: none"> <li>• TRF.*** (15 FILES)</li> </ul>	<p>Traffic volume calibrated from present OD tables.</p>
<u>OTHERS Directory</u> <ul style="list-style-type: none"> <li>• SLINK.DAT</li> <li>• PART.DAT</li> <li>• ZONECODE.DAT</li> <li>• AADT.DAT</li> <li>• TRAF.DAT</li> <li>• COMCODE.DAT</li> <li>• ZONE.DAT</li> </ul>	<p>Link number at which OD survey was carried out and direction of OD survey</p> <p>Traffic zone numbers to be divided into several traffic nodes and their share of generation and attraction.</p> <p>Traffic zone number and corresponding municipality name and municipality code.</p> <p>Traffic count data at OD survey stations.</p> <p>Traffic count data in the study area gathered from various study reports.</p> <p>Data by commodity code used in OD surveys.</p> <p>Present traffic zone characteristics data regarding generation and attraction, road condition factor, population, GRDP, trip rate, and traffic generation per person in each traffic zone.</p>

### 3.4.3 Data Files for Future Traffic (FUTURE)

The directory **FUTURE** stores data files for forecasting future traffic demand, and results of future traffic demand analysis including future ODs and future traffic volumes.

List of data files and their brief descriptions in future traffic analysis directory is shown in Table 3-4 while data structure of this directory is illustrated in Figure 3-5.

Subdirectories **1997**, **2004**, **2010** and **2016** store OD tables of each island for "with project" and "without project" cases in respective years.

Subdirectory **OTHERS** contains data files utilized for establishment of future ODs, such as population projection data, GRDP projection data, gravity model coefficients and future traffic zone characteristics data. This directory also keeps future traffic volumes computed based on future OD files and networks.

Subdirectory **NETWORK** contains road network data of future road network in each island in the study area.

In addition to road network data of each island, the following six road network files are created for analysis of inter-island traffic.

- Fluzonnet.Dat      Luzon Island road network
- FLdnet.Dat      Luzon - Mindoro Inter-island Network
- FLsnet.dat      Luzon - Samar Inter-Island Network
- FNcnet.Dat      Negros - Cebu Inter-island Network
- FPgnet.Dat      Panay - Guimaras Inter-island Network
- FPgnnet.Dat      Panay - Guimaras - Negros Inter-Island Network

### 3.5 SEA AND AIR OD DATA (SEA-AIR)

Directory **SEA-AIR** stores sea and air transport OD data. Two files for Air transport ODs and for four (4) files for sea transport OD data are kept in this directory.

Table 3-5 shows name of data files stored in this directory, while Table 3-6 presents sample of air passenger OD and cargo movement in PMO.

TABLE 3-5 DATA FILES IN SEA-AIR DIRECTORY

Filename	Description
<b>Air Transport Data</b>	
• AIRPASS.DAT	Air Passenger OD
• AIRODPRN.WRD	Air Passenger OD reformed into OD table format
<b>Sea Transport Data</b>	
• CARGO1.PRN	Share of commodity type by PMO in %
• CARGO2.PRN	Cargo and Passenger by Port
• PROUTE.DAT	Navigation route between port-zones
• PORTOD.PRN	Inter-port-zone OD Matrix

**TABLE 3-4 DATA FILES IN FUTURE DIRECTORY**

Filename	Description
<u>1997 Directory</u> <ul style="list-style-type: none"> <li>• OD1997WO.***</li> <li>• OD1997WT.***</li> </ul> (37 files)	1997 OD tables for with project and without project in each island including inter-island OD tables.
<u>2004 Directory</u> <ul style="list-style-type: none"> <li>• OD2004WO.***</li> <li>• OD2004WT.***</li> </ul> (37 files)	2004 OD tables for with project and without project in each island including inter-island OD tables..
<u>2010 Directory</u> <ul style="list-style-type: none"> <li>• OD2010WO.***</li> <li>• OD2010WT.***</li> </ul> (37 files)	2010 OD tables for with project and without project in each island including inter-island OD tables.
<u>2016 Director</u> <ul style="list-style-type: none"> <li>• OD2016WO.***</li> <li>• OD2016WT.***</li> </ul> (37 files)	2016 OD tables for with project and without project in each island including inter-island OD tables.
<u>NETWORK Directory</u> <ul style="list-style-type: none"> <li>• *****NET.DAT</li> </ul> (21 files)	Road network data of future road network in each island. New road links proposed by the study are added to present road network data.
<u>OTHERS Directory</u> <ul style="list-style-type: none"> <li>• AVELOAD.DAT</li> <li>• POPULAT.DAT</li> <li>• GRDP-ALL.DAT</li> <li>• GRAVITY.DAT</li> <li>• FZONE.DAT</li> <li>• ZONE.DAT</li> <li>• ALLTRAF.DAT</li> </ul>	<p>Average loading of passenger and commodity by vehicle type at each OD survey stations.</p> <p>Present and future population data by municipalities.</p> <p>Present and future GRDP data by municipalities.</p> <p>Gravity model coefficients derived from OD survey results.</p> <p>Future socio-economic data such as population, GRDP, and road condition factor for with and without case by traffic zone.</p> <p>Present traffic zone characteristics data regarding generation and attraction, road condition factor, population, GRDP, trip rate, and traffic generation per person in each traffic zone.</p> <p>Future traffic volume computed based on future ODs and road networks for with and without project cases.</p>

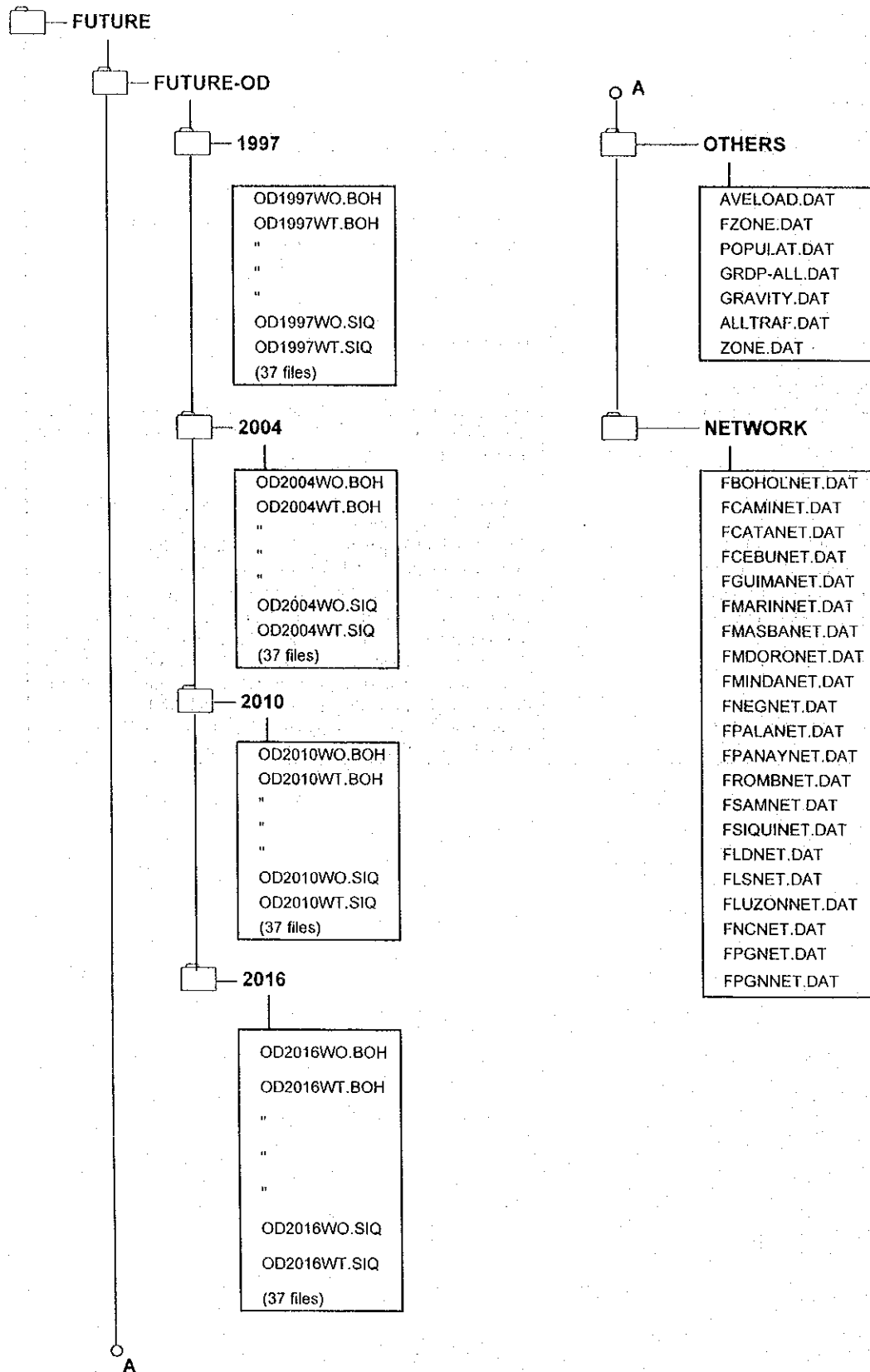


FIGURE 3-5 DATA STRUCTURE OF FUTURE DIRECTORY

TABLE 3-6 SAMPLE OF AIR OD AND CARGO DATA

AIRPASS.PRN

Manila	(301)-Mamburao	( 5)	6260
Manila	(301)-San Jose	( 7)	42204
Manila	(301)-Puerto Princesa	(13)	155116
Manila	(301)-Marinduque	( 1)	30418
Manila	(301)-Tablas	(20)	2499
Manila	(301)-Masbate	(32)	32496
Manila	(301)-Iloilo	(48)	461291
Manila	(301)-Kalibo	(34)	243818
Manila	(301)-Roxas	(40)	71469
Manila	(301)-Bacolod	(54)	321009
Manila	(301)-Cebu	(77)	1324504
Manila	(301)-Dumaguete	(83)	80711
Manila	(301)-Tagbilaran	(62)	32330
Manila	(301)-Tacloban	(103)	225888
Manila	(301)-Calbayog	(119)	21628
Manila	(301)-Cataraman	(117)	24202
Manila	(301)-Zamboanga	(202)	151969
Manila	(301)-Dipolog	(201)	41290
Manila	(301)-Cagayan de Oro	(134)	296888
Manila	(301)-Davao	(153)	585862
Manila	(301)-Gen. Santos	(151)	27355
Manila	(301)-Cotabato	(207)	75900
Manila	(301)-Butuan	(155)	39848
Manila	(301)-Surigao	(162)	1249
Manila	(301)-Caticlan	(33)	26012
Puerto Princesa	(13)-Iloilo	(48)	20667
Cebu	(77)-Iloilo	(48)	101654
Cebu	(77)-Kalibo	(34)	17252
Cebu	(77)-Bacolod	(54)	87902
Cebu	(77)-Dumaguete	(83)	9692
Cebu	(77)-Tagbilaran	(62)	17519

CARGO1.PRN

1	PMO-Batangas								
	INBOUND								
	Domestic Cargo	215476	8	1030890	39	1334450	50	76812	3 2657428
	Foreign Cargo	533565	5	429042	4	10537806	92	12040	0 11512453
	PMO-Batangas								
	OUTBOUND								
	Domestic Cargo	298966	6	1009630	20	3798923	74	20272	0 5127791
	Foreign Cargo	187625	11	56060	3	1476882	86	195	0 1720762
2	PMO-Cagayan de Oro								
	INBOUND								
	Domestic Cargo	312299	12	813582	30	1513616	56	71103	3 2710800
	Foreign Cargo	125360	2	288627	5	5291347	93	775	0 5706109
	PMO-Cagayan de Oro								
	OUTBOUND								
	Domestic Cargo	563263	33	607396	36	23629	1	501140	30 1695428
	Foreign Cargo	319484	6	202565	3	5266847	91	0	0 5788896
3	PMO-Davao								
	INBOUND								
	Domestic Cargo	248763	14	970091	55	497566	28	46315	3 1762735
	Foreign Cargo	192542	22	344938	40	307469	36	18899	2 863848
	PMO-Davao								
	OUTBOUND								
	Domestic Cargo	593810	53	329854	29	11302	1	183890	16 1118856
	Foreign Cargo	1321783	84	248266	16	1060	0	0	0 1571109
4	PMO-Dumaguete								
	INBOUND								
	Domestic Cargo	153327	18	552256	65	67969	8	80985	9 854537
	Foreign Cargo	0	0	25582	100	0	0	0	0 25582