COMPUTERISATION OF TRANSPORT SYSTEM (MASS-TRANSIST) (A CASE STUDY OF N.S.T.A)

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COMPUTERIZATION OF TRANSPORT SYSTEM (MASS-TRANSIST) A CASE STUDY OF NIGER STATE TRANSPORT AUTHORITY MINNA (NSTA) NIGER STATE.

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A PROJECT SUBMITTED TO THE DEPARTMENT OF MATHEMATICS/SCS, SCHOOL OF SCIENCE AND SCIENCE EDUCATION. IN THE PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF PGD IN COMPUTER SCIENCE.

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CERTIFICATION

Having gone through this project carried out by I.M Bello MCS/057 and has been prepared in accordance with the regulations it is in our opinion that it is up to standard for PGD in Computer Science.

(HEAD OF DEPARTMENT) DATE

(PROJECT SUPERVISOR) DATE

(EXTERNAL EXAMINER) DATE

DEDICATION

I dedicate this project to my children and the pride goes to my dear Wife.

ACKNOWLEDGEMENT

May peace and Blessing of Allah (S.W) be upon (SAW) his companions and those that copy them till the last day. Although it would be impossible to acknowledge all of the assistance that we have received in compiling this project, I do want to mention the contributions of certain individuals. I am indebted to the Head of Department M/SCS FUT, Minna; Project Supervisor Dr. K. R. Adeboye; Program Coordinator Prince R. O. Badamasi among others.

Special mention should be made of Dr. S. O. Reju ofcourse the entire Staff of (MCS) department that provide us some of the benefits of their experience, the University Computer Centre, Niger State Transport Authority (NSTA) Minna. Indeed the Director Planning Research and Statistics/Computer, A. B. Mohammed provided similar encouragement. I am particularly appreciative of my father for his tireless financial contributions.

Finally recognize the patience, understanding and cooperation shown by my wife during the busy period of studies in general was a source of inspiration and happiness that I need to acknowledge publicly.

ABSTRACT

The purpose of this book if to provide a detailed treatment of the methods and procedure involved in planning and designing computer simulation experiments as well as theory on which these methods are based. It is assumed that the reader has had a basic mathematical statistics and possesses a minimal knowledge of computer programming. Deficiencies in these pre-requisites may easily be remedied by consulting the references which we have included on each of these topics.

The project as usual, is provided into 5 chapters; chapter 1 begin by defining the "Basic Concepts of Transportation System"; chapter 2 "brief History of the Authority (NSTA) as a case study has discussed. In chapter 3 we describe several alterative methods that contains Techniques of generating correlated varieties; chapter 4 consist of a set of computer model, emphasis is laid on the pseodocode of the system output on system implementation. Finally in chapter 5 we have conclusion and recommendation.

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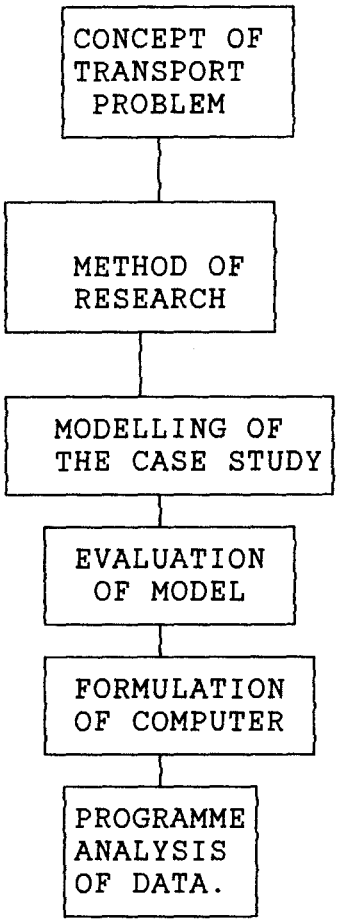
CHAPTER ONE

BASIC CONCEPT OF TRANSPORT PROBLEM:

1:0 INTRODUCTION:

Transport today is a matter of passionate public concern, overtime it become increasingly apparent that the nation needed to develop a more blanched transportation system so coordinated that each form of transportation would concentrate on the type of service for which it was best fitted in terms of real cost and service considerations.

This project work is to provide these new analytical tools known as computer experiment in the area of operation research. our primary interest lies in the experiment that takes place for a long period of time that enables the analyst to determine how one or more changes in aspects of a system may affect other aspects of the system; the experiment involves a procedure consisting of the illustration below.



The study therefore attempt to analyse the impact of transportation development based on a mixed economy with significant government intervention in the market in order to meet socio-political as well as commercial objectives. The experiment therefore seeks answers to these following questions:

- Do improvement in transportation network have any corresponding effects on settlement pattern and economic growth?
- How does the urban population perceive the economic improvements in accessibility?
- Examine the progress development projections problems and achievements?

The basic methodology proposed here would also be applicable to any scientific discipline.

1:1 **CONCEPT OF LINEAR PROGRAMMING:**

A linear programming problem is one where:-

(i) The feasible region is a subset of the nob-negative portion of R_2, defined by linear equations and inequalities;

(ii) The objective function to be minimized or maximized is linear.

Generally linear programming problem can be described as problems in which the objective function, as well as the constraints, can be expressed as linear (i.e. where the cost incurred or revenue produced by every possible activity is strictly proportional to the value of that activity)

Example:-

The expression for total revenue ( ) is a linear functions since an increase in either X^1 or X^2 etc will cause the revenue to increase by a proportional amount. This can be state in a standard form as:-

$$\text{Max } z = c1x1$$

$$\text{subject to } .. \quad aijxi = bi, \quad i=1,2,3...m$$
$$j=1,2,3...n$$

1.2 **BASIC DEFINATION OF TRANSPORT**

A transport problem involves finding the cheapest way of transporting raw materials and commodities to production centres and distribution of goods and services to consumption centres.

Example:-

If Niger State Transport Authority is concerned with transporting people using two types of vehicles and from these vehicles transport to (5) five local government area. it is assumed that the total demand from the five local government is equal to the number of available vehicles. This information is illustrated below:-

(i) The numerical labels at transporting centres are their daily availability;

(ii) The numerical labels at the demand (LGA) Centres are the daily demands;

(iii) The line segments represent transport routes from transporting point to the centres.

(iv) The numerical labels on the line segments circled represent the cost of transportation of head along the routes.

1.3: **OPTIMAL SOLUTION:**

This is a solution which exterimizes the objective functions:

$Z = c^{T}X$. and has the following characteristics;

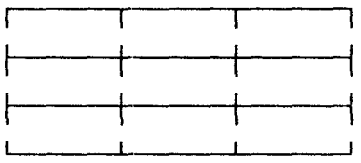
(1) It involves O+m-1 (if tabulate) squares with circles.

(2) There are no circuits among the squares in the solution

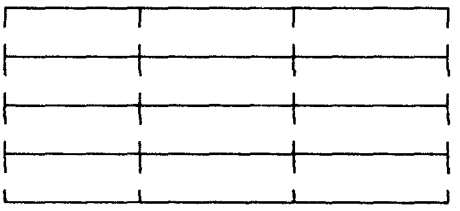
Example:-

(a) above shows an optimal solution since n+m-1 = 3+2-1 = 4.

(b) is not an optimal solution since +2-1 = 4 = 5.



(a)



(b)

CHAPTER TWO

METHOD OF RESEARCH:-

2.0: INTRODUCTION:

For the purpose of this project work, it is imperative to consider the restrictions which made it difficult to analyse large opinion, the limited time and resources available, the type and complexities of the transportation system operating in Niger State.

Our finding methods therefore include what the pattern the project should take, they including the following.

2:1 INTERVIEW METHOD:-

This methods is used to collection information from individuals or groups the respondents generally are the current users of the existing system or potential users of the proposed system. The interview method is the best source of qualitative information.

The advantage of this method is that in-accurate or false data may be given to the researcher; The reason may be:-

- Mis-understanding;
- Deliberate intent to mislead;
- Forgetfulness.

2:2 QUESTIONNAIRE:

This method is used to collect data in written form about various aspects of an investigation from a large number of persons. The advantage are that there is input from a large source and there is freedom of expression.

This method of data collection is the producing few replies and those of the bias nature. (see appendix 1).

2.3: **METHODOLOGY:**

This is the significant section of the study in the sense that the validity of the subject tittle is determined up-till the stage of data analysis. In carrying out this objective it is necessary to state the methods of data collection employed, the problem involved in the data collection, the solution technique and limitation.

2:4 **METHOD OF RESEARCH EMPLOYED**:-

In conducting this study, one major problem to be solved is the technique employed in the collection of data to be used. however the following factors should assist in choosing appropriate method(s) of data collection.

- cost of data;
- Collection time;
- Nature of the study and convenience.

Based on these factors the researcher obtained information to be used in the study from three major sources;

- Information about the case study from the management;
- Operating staff;
- the (Potential) users.

2:5 **PROBLEMS ENCOUNTERED:**-

2:5:1 **FORM OF DATA:**-

Retrieving information is considered as highly confidential by the NSTA Management; much time is spent on extracting the required data. another serious problem encountered was the standard routing system of the authority.

2:5:2 **NOT - AVAILABLE:-**

The non-available information as required another problem encountered. the complex operating system of the authority could not be assessed.

2:6 **SOLUTIONS EMPLOYED:-**

Most of the problems encountered were reduced to minimum, because the researcher is armed with post-Graduate school(FUT Mx) introduction was permitted to obtain data from the relevant documents in the conditions that;

(i) Other than administrator names no name(s) and candidate number should be used;

(ii) All analysis be carried out within the premises of the Niger State Transport Authority (NSTA) under the supervision of a senior planning officer.

2:7 **LIMITATIONS:-**

This scope of the study depends on the data collection based on cost reduction Technique of services rendered by the Mass-Transit (NSTA) in the State i.e.

(i) Local running,

(ii) intra-State, and

(iii)inter-State.

CHAPTER THREE

MODELLING THE CASE STUDY:

3:0 INTRODUCTION:

The primary justification for the Niger State Government participation in Transportation arose from the need to provide efficient public transportation system in the State.

The important role that an efficient public transportation system plays in any civilized society can not be over emphasized. Such system provides the mode by which majority of inhabitant commutes from one place to another. Thus, the Niger State Transport authority has a lot to contribute to the socio-economic development of Niger State in particular and Nigeria as a whole.

3:1 HISTORICAL BACKGROUND:-

The participation of government agencies in the bus Transport business started on the 11th August, 1988. The fleet of buses at that time numbered 55, made up of Federal Mass Assisted Programme and Niger State Government. The State Government has increased the fleet of the buses to 89 in 1989; some of these buses include Luxurious bus, mikados Benz 911 and the Scania (Asian) buses. These contravertial scania buses which lose part of the initial 55 buses are first class reconditioned buses, these buses did not stand the test of time and they had to be withdrawn.

The operation of the transport system was under the supervision of a task force headed by a Military Administrator in person of Lt. Col. Abubakar Idris who reported directly to the Governor of the State, in line with Military personnel disengagement from the administration in the country the Military deployed the army to the tracks in the year 1990.

The affairs of the authority was sconfored on Alhaji Idris Ahmed as sole Administrator who managed the authority for a period of six month only. The authority suffered further deterioration; the Lt. Col. Lawal Gwadabe Military Administrator invited an experienced traffic officer to head the authority as a sole administrator in person of Alhaji Shehu Umar Danyaya.

However, the need to establish a well organised quasi-autonomous transport organisation become inevitable as the provision of public transportation within Niger State become a more complex task. The Civilian Administration of Governor Musa Inuwa appointed an interim Yusuf Galadima in the status of Sole Administrator by March 1992, who was eventually appointed as the chairman and forerunner of subsequent board of the authority by the administration of Col. C.K. Emein in 1994.

3:2 **BUS EQUIPMENT INVENTORY**

Year of Purchase	Make of Vehicle	No of Setters	Total
1988	Mecedes Benz 911	45	7
"	" " Tovin	-	1
"	" " 180	33	6
"	" " 6080	25	5
"	Luxurious	39	8
"	Scania-Asian	33	11
"	Toyota Hyice	18	15
"	Toyota Civilian	30	8
"	Peugeot S/Wagon	7	5
"	Peugeot J5	21	10
"	Aces	41	1
1989	Datsun Nissan	30	8
"	Peugeot Pick-up	Haulage	4

3:3 **THE NIGER STATE TRANSPORT AUTHORITY:-**

The Niger State Transport authority (NSTA) is the largest and most comprehensive bus transport system serving in the State; established mainly to provide Mass Public transportation for the inhabitant of the State; with a staff strength of 300. By 1994 the major steps taken by the Military Administration Col. C.K. Emein was setting up of an able board of Directors under the Chairmanship of the Sole Administrator of the Authority.

A program of action was set up among which are the following.

- Centralization of the administration.
- Promotion of deserving workers and implementation of the authority grounded bus.

The following departments exist in the authority:- administration, finance and supply, Engineering, Planning and Monitoring, Traffic and Operations. The Management Committee consist of all divisional and departmental heads, who meet regularly to review the general situation and initiate on how to best run the authority in order to achieve it objective. A supervisory Ministry (i.e. W>H) overseas the general operations of the authority in order to ensure that its operation are in line with government policy.

3:4 **STAFF MATTERS AND TRAINING:**

The authority staff strength as at November 1995, stood at 300, this was against the 25 in March 1994. The authority maintains incentives to all cadres of staff in form of bonuses, prizes and letters of appreciation are given periodically as and when due apart from promotion for deserving officers. The operating crew are also provided with new and attractive uniforms while on duty.

Drivers under go refresher courses from time to time; and also probationary period as a punitive measure resulting from careless driving and vallation of the authority's rules some of those rules include the prohibition of drinking, or even sitting in an over relaxed posture which driving; the category of the drivers are usually professional class "E" driving licence with an experience of about 7 year and above.

In order to make the authority self-reliant, the authority has established a replacement fund for its flint of buses and this has been invested with some of its destination routes's commercial banks for the purpose of buying new buses and spare parts in future.

3:5 **ANALYSIS OF PRESENT ROUTES:**

After extension studies, the services rendered by the Niger State transport authority are being operated on schedule and they are available between 6.ooam in the Morning and 12.oo and 3:15 pm. The routes are amended by the authority daily to accommodate new finding with a view of giving commuters maximum satisfaction. New routes were introduce having observed the movement of commuters in the State and discussion are going on with appropriate authorities to expend t routes to every part of the state and beyond.

Taking into consideration the abundant potentials for tourism in the State, the authority routes special buses on excursion to places like the Zungeru Colonial Centre the first President of Nigeria Centre, Kainji and Shiroro dams and other places of interest within and outside Niger State. the authority also operates for interested parties at any time or day companies and other organisation can utilise the authorities bus on special routes service thereby relieving themselves of the burden of purchasing and maintaining staff bus. Through the various routes system. The authority has been making significant progress on its commercial advertisement programme.

Niger State Transport Authority buses now display advertisement on the rear and sides of the buses. In addition to its popular routes system plan are in the pipeline to attract advertisement on the walls and of the terminals and bus shelters. Consider a transport route system consisting of a service stations operating in parallel (figure 1-1). Input Unit arrive at the system and are admitted to the first-come, first -served basis. The service time for each of the destination having its own given probability distribution for service time.

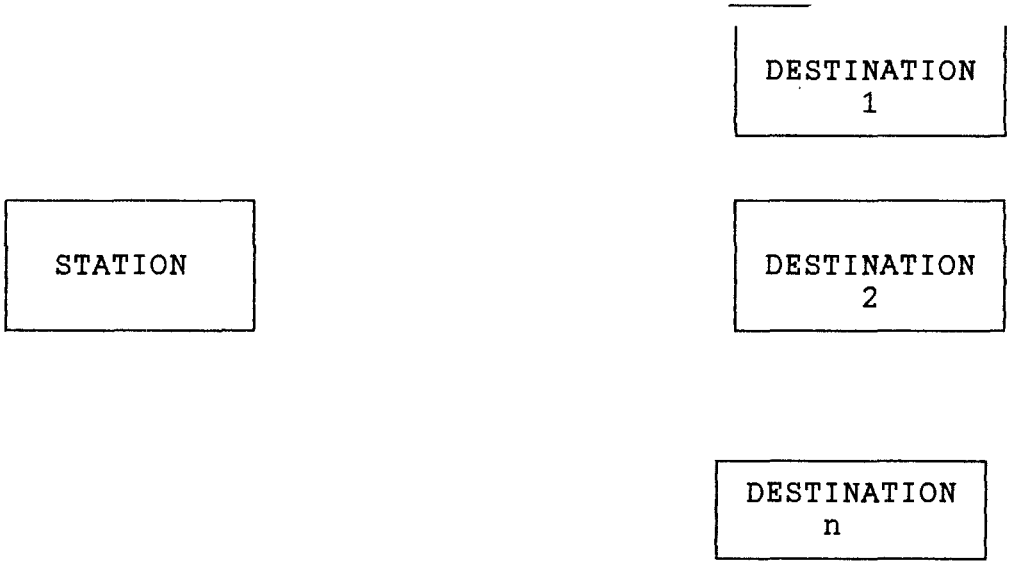


Figure 1-1. A Multichannel Transport System.

3:6 **THE ROUTING SYSTEM:-**

Over 25 routes throughout length and breadth of Niger state are covered by the services of the NSTA within and outside. The routing services are divided into three categories.

1. Daily/Town services routing-routes which vehicle ply daily;
2. Weekly routing services-routes vehicles ply weekly.
3. Overnight routing services-routes vehicles spending a night.

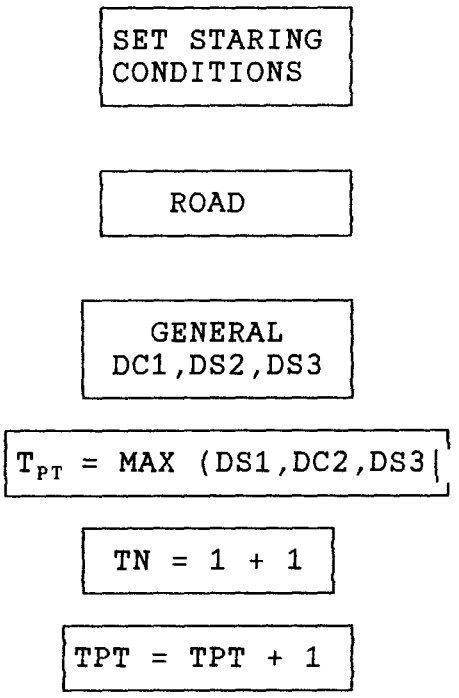
The tables below give the voting system which includes the towns, number of setter and unit.

Table 3-1 (a) Daily Routing System (inter and intra - States).

Routes	No of Setter	Frequency	Unit cost Per Head(=N=)
Minna to Lagos	54	2	300
Onitsha	45	2	300
Jos	33	2	240
Ilorin	33	2	150
Kaduna	56	2	120
Suleja	56	4	20
Kontagora	56	4	35
Bida	56	6	15
Wushishi	33	4	20
Kuta	33	4	20
Kagara	39	3	25
Makurdi	33	2	240
Table 3-2- (b) Weekly Routing System:			
Minna to Rijau	33	1	50
Lemu	33	2	30
Kutigi	56	1	25
Mokwa	56	1	45
Gulu/Muye	33	1	45
K/tonkoro	33	1	50
Table 3-(c) Overnight Routing System:			
Manna to Lagon	54	1	300
Onisha	45	1	300
Makurdi	33	1	240
Suleja	56	1	20
K/gora	56	1	35
Bida	56	1	15
Wushishi	33	1	20

Source:- Niger State Transport Authority, Manna. Date 8/12/95.

The flow chart in figure 3-2 begins with the usual initialization routine. That is DS1, DS2, DSN, TPT, TNF, SUMAT,



Note:-

DC1 = Demand Centres 1,2,3

TPT = Total Unit Transport

TNF = Total Number of (frequency) Transport

SUMAT = Sum All total.

The number of centres to be transported are read into the computer, next we generate three process times determine number of frequency and add t to total Unit transport. In either case, after updating the appropriate records, a new set of process times is generated, and the whole procedure is then repeated.

CHAPTER IV:

PROGRAMME DESIGN AND IMPLEMENTATION:

4.1 INTRODUCTION:

In the first three chapters I explained briefly what a concept of transportation system is in principle, the background story of Niger State Transport Authority (NSTA) and some Techniques in which this principles are collected.

The essence of using computer is to ensure that the problem which it is required to solve is in a form such that the computer can automatically compute the desired result. That is, the computer must be presented with a set of instruction which will, when obeyed, produce the correct output. Such a set of instructions is called PROGRAMME., and the human activity of devising the instructions is called PROGRAMMING. Foe the purpose of this project our choice of programming language is the application of dBase III+.

4.2: PROGRAM DESIGN AND DEVELOPMENT;

When you create a command file (program) you are actually WRITING SOFTWARE. There are five parts to writing dBASE Software. First you design the programm by determining it purpose, second unless your programm will use an existing database. You must design a database structure, third to outline the program you write pseudocode, fourth first you must write the program. In dBASE you do this by typing MODIFY - COMMAND and then typing the program on the screen. Fifth, you run the program to test it. Let's examine each of these steps in detail.

Step 1:- OUTLINE THE GENERAL IDEA:

It's good idea to write the general idea of a programm on paper first. For example, suppose we want to develop fancy transport system list. The general idea might be something like this.

This system will be designed to manage a transport route and will operate from a menu of choices, when first run, the system will display Transport menu options.

1. Add new routes and rate;
2. Sort the transport routes;
3. Print routes and rate;
4. Edit data and
5. Exit the system.

The system will be completely "menu driven". That is once you Do the main command file, jobs like adding new routes, sorting etc will be performed by simply selecting menu options or answering question on the screen.

Step 2:- DESIGNED STRUCTURE:

Rec#	FIELD NAME	TYPE	WIDTH	D
1.	INTER-STATE	C	25	
2.	INFRA-STATE	C	25	
3.	DAILY	C	15	
4.	OVERNIGHT	C	10	
5.	WEEKLY	C	15	
6.	TOWN-SERVICE	C	20	
7.	SETTER	N	6	2
8.	ROUTE	C	15	
9.	RATE	N	6	2

Step 3: DEVELOP PSEUDOCODE:

It's a little easier to write a program if you first write it in plain English. Doing so is called writing Pseudocode, when you write a pseudocode you should try to specify the logic and series of events that will occur in the program.

So that when you have to translate the program to actual database language much of the task is already defined. It is easier to write a program from PSEUDOCODE jointed on a piece of paper than from pure thought. Here is pseudocoded example of the Transport menu program for the NSTA system.

COMMAND FILE NAME: MENU PRO.

PURPOSE: Present a menu of option for managing the transport system.

PSEUDOCODE:

```
"               SET TASK OFF
"               USE THE TRANSPORTING ROUTES DATABASE
"               Repeat the transport menu until option to exit
"               clear the screen
"               Display the transport menu like this;-
                   Add New Routes
                   Sort data
                   Print labels
                   Edit data
                   Exit the transporting system.
"               Ask which option is desired
"               If option 1 selected Append New data
"               If option 2 selected sort by type
"               If option 3 Print Transporting labels
"               If option 4 Edit data
"               Redisplay the transport menu(as long as option
                     5 was not selected
"               Transporting system.
```

Notice that we have defined the logic of the MENU program here we have also given it a title and mentioned its purpose. if it takes a long time to write the actual program we can refer back to the PSEUDOCODE for reference.

We will notice that the PSEUDOCODE describes the task in English, but it looks like a program too. This intermediate step makes the next step a little easier. From this point we can write the actual program using proper dBASE III plus commands and syntax.

STEP 4: **WRITING THE PROGRAM:**

Once we have the PSEUDOCODE outline of the program, in dBASE we use MODIFY COMMAND, now let us write the actual program

```
****** Transport routes system menu
       SET TALK OFF
       USE TRAN
       STORE O TO CHOICE
   *******PRESENT TRANSPORT MENU
          DO WHILE CHOICE  < 5
          CLEAR
          ? Transport menu
          ?
          ?`1. Add new data.
          ?`2. sort data
          ?`3. print data
          ?`4. Edit data
          ?`5. Exit the Transport system.
    INPUT ` enter your choice (1-5) from above: To choice ******
perform appropriate task based on choice
    Do CASE
       CASE CHOICE = 1
       APPEND BLANK  (  )
       CASE CHOICE = 2
       USE TYPE INDEX
       CASE CHOICE = 3
       DO LABELS
       CASE CHOICE = 4
       EDIT
    ENDDO.
```

We see how the actual program resembles the PSEUDOCODE that was outline. Set the dBASE TALK OFF and uses routes as the database, store a zero to a memory variable called CHOICE. This is so that the DO WHILE CHOICE < 5 condition will be true when it enters the loop. Then clear the screen and display the main menu using ? commands. Then the questions enters your choice (1- 5) from above and wait for an answer. If the choice was 1, dbase goes to Append, mod.2, dbase will sort by type 3, dbase our other command file LABELS, and so on.

After the selected option has been performed, dbase will eventually each the enddo command at the bottom of the command file. The loop will repeat, redisplaying the transport route menu and question. If the choice is 5, Exit the transport system, the DO WHILE CHOICE < 5 condition for the loop will cause the ENDDO not to repeat the loop, and the program will end.

Step 5: **RUN AND TEST PROGRAM.**

To test the program, of course, we will need to run it, so type this command.

DO MENU (Enter) the transport menu is displayed.

APPEND
SORT
PRINT
EDIT
EXIT.

If you know type 1, dBASE will enter the append mode, so any one who type the command DO MENU can add new data to the database without typing the append command. This is because the program has line which states CASE CHOICE = 1, and beneath that is the APPEND command. Because CHOICE did = 1, dbase goes into APPEND mode, we can then add as many new data to the transportation list as we wish.

When we exit the APPEND mode (by pressing Return instead of typing another name) the transport menu reappears.
Why ? because none of the CASE clauses below the APPEND command in the program will be true.

dBASE wont do the commands in CASE CHOICE = 2 OR =3,and so forth, because CHOICE = 1, when dbase reaches the ENDDO command, CHOICE is less than 5, so the program loops around up to DO < 5 command, and the menu is displayed and the input questions reappears. we could type another option now, and whatever option you select (1-5) will be stored in CHOICE. The the appropriate function will take place (APPEND INDEX and so forth).

Notice in the command file that if we select option 3, PRINT LATERS. dbase is told to do a different command file. Label. PRG Programme. as we may recall, the last line in LABELs is the Return command, when one command file calls another, as in this case were Menu calls Labels, the Return command tells dBase to go back to where it left off in the first program. Therefore Menu will do Labels, will print the transportation labels and then Return to the next command in Menu.

We are assuming here that the program even correctly the first time. More likely, it didn't, and you got one of dBase many error messages. We usually do not see the errors in a program until we try to run the program. The computer catches them right away. The most common errors that occur in command files are syntax errors, which result from misspelling a command, a field name or variable that does not exist example:

Variable not found
?
Case choice = 1 terminate command file? (Y/N)

When dBase encounters an error in a command file, it will display an error message and usually give the chance to correct. "Terminate command file?". dBase will return to the dot prompt. The we can Modify command menu to correct the error.

A COMPLETE TRANSPORTATION (PRG), SYSTEM (NSTA): VIEWING THE MAIN MENU STRUCTURE.

The system consist of four program linked by the options of a fifth program. Let's take a look at the plan for each of the system's major components.

The main menu will be the heart of the transportation system. It will be the first and the last thing that the user sees. When we first run the menu program with the command DO TRANSPORTATION (ENTER) the system will display.

1. Add new names
2. Print labels
3. Edit data
4. Delete data
5. Exit Transportation system. (Enter choice)

4:3 **DESIGN:**

We can create this dBase, named Trandata. Dir using Create command from the dot prompt.

Note: If we are using a floppy-disk system, be seme to enter the command

SET DEFAULT TO B (Enter)

before entering the dBase or command files.

Structure of new Trandata.DBF database as shown.

Rec #	Fieldnms	Type	D
1.	Inter-State	15	
2.	Intra-State	15	
3.	Daily	15	
4.	Overnight	15	
5.	Weekly	10	
6.	Type	12	
7.	Route	15	
8.	Rate	6	
9.	Number of seat	4	

The custom transportation system uses new report and screen formats. We will need to set up these format before writing a programm.

Transportation system screen:-

The custom screen for adding and editing data is named Routes 1,2,3....

Transportation system Directory:-

Use the usual MODIFY or CREATE REPORT to build the report format and name the fickle TRANSDIR.MAT. Define the first column of the report as below with a length of 25.

TERIM (25) (Enter) this makes the first column of the report contain blank. Define the second column of the report format like this Inter-State Intra-State SP (15) (Enter) Transportation system labels:-

Use the usual CREATE or MOD.LABEL commands and name of label format files TRANSLAB. LBL with whatever assign size.

SOFTWARE STRUCTURE FOR THE TRANSPORTATION SYSTEM:

When designing a custom system with many command files, its a good idea to take an extra stop of drawing a linearchical structure of how the program interrelate.

Add new Rec
print Rept
Edit data
Delete Rec
Exit
Transreps PRG
Print Reports
Tranedit.PRG
Male changes
Trandel.PRG
Delete Rec.
TranExit
Exit system

The five command file sthat make up the transportation system.

Trans.PRG - The main Menu:

Having developed a menu program one should not skip the planning stage. here is the PSEUDOCODE for the Trans.PRG. program.

COMMAND FILE NAME: TRANS.PRG.

PURPOSE: Present a menu of options for the TRANSPORTATION SYSTEM.
Set up initial dBase parameters.
Open the database and index files;
Begin loop for main menu
Clear the screen
display the main menu
Get user's choice;
Branch to the selected task or program;
Repeat menu (if exit not required);
Otherwise return to the dot prompt.

Before writing the program; let me talk about which route in more detail.

The program begin with some opening comments that display the name of the program and its functions. The several dBase parameters are set. First, Set Talk Off keep extraneous messages from appearing on the screen. Then set status off turns off the reverse-video status Bar at the bottom of the scree because it saves no purpose in the transportation system. The Set Default to C command makes a hard disk the default drive on a floppy disk system. This line should be changed to Set Default to B. See appendix 2.

The next route in tran.PRG looks like this, It opens the TRANDATA.DBF database and then TRANRATE.NDX and TRANTOWN.NDX, index files.

Next do while loop, which repeats until the user selects 5 to exit, displays a menu of options. The TEXT and ENDTEXT commands displays all lines in between as simple text on the screen or printer. This is shortcut to using many? or (a) commands.

The @, Say, Get and Read commands are used. The picture "9" portion forces the user to enter a number (not character) and the RANGE 1,6 portion forces a number between 1 and 6. a number outside this range is rejected and the user is ask to try again. This route gets the user's input.

Next a Do CASE clause decides what to do, based upon the user's menu selection. If the user selected option. 1 to add new records, the program set the screen format to the TRANSCRN. FMT format file and allows the user to add new records with the APPEND command. When the user finishes, the screen is set back to normal (close format), and the menu loop repeats.

Other menu option require branching to external program; as shown in the Do CASE clause.

********* TRANSPORTATION PROGRAM
DO CASE
CASE CHOICE = 1
SET FORMAT TO TRANSCRN
APPEND
CLOSE FORMAT
CASE CHOICE = 2
ENDCASE

The bottom of the Tran.PRG Command file marks the end of the do while loop and end of program (when the user selects options 6 to exit). Because dBase ignores all words to the right of an ENDDO or ENDIF command we can add programmer comments there, which make good reminders about which ENDDO goes with which
If before rearing to the dot prompt.

TRANSREPS.PRG: PRINTING TRANSPORTATION REPORTS.

The TRANREPS.PRG command file displays a menu of report choices a menu of sort orders, an option to display the report of the screen or printer. here is the PSEUDOCODE for the TRANREPS.PRG command file.

COMMAND FILE NAME. TRANREPS.PRG
PURPOSE: Display sort and report options and print reports.
PSEUDOCODE
- Clear the screen and ask which report to print;
- If no report requested return to main menu
- Display sort order option and get selection
- Use appropriate index file based on sort selection
- If alphabetical sort, use TRANNAME.NDX.
- If Zip code sort, use TRANZIPS.NDX.
- If no sort, don't use an index.
- Ask about quarry option;
- If query requested, display query form, allow changes then filter about the printer;

- Ask about the printer;
- Print the report;
- If directory requested, use NEWDIREC format;
- If label requested, use TRANLAB label format;
- Pause screen if printer not selected;
- Return to main menu.

When we have written the PSEUDOCODE, we are ready to write program, see appendix 3 is the complete TRANREPS.PRG, Command file.

The TRANREPS.PRG Command file opens with some comments, a command to clear the screen, and a menu of report choice displayed with the TEXT..ENDTEXT commands. Then @, Say, Get read combination is used to wait for and store the user's menu choice. These first lines of the command file also store the user's menu selection in a variable named REPCHOICE.

If the user simply requests to return to the menu, the if clause below sends him back immediately. Next, a route displays a menu of sort options, and then a Do CASE clause sets up the appropriate index file (or no index file) for the sort.

Next, the program ask if the user wants to print all the records in the database or to set up a Query. The user's response is stored in a variable name QCHOICE. The PICTURE "!" portion converts the user's answer to uppercase as soon as it is entered.

If the user options to query the database, a Query form named TRANGEN.QRY is brought to the screen for the user to fill in or edit. When completed, the set FILTER TO FILE command.

Next a small routine asks the user if the report should be printed. The user's answer is stored in the variable TOPRINT. If the user options for the printer a variable named PMACRO is assigned the words "TO PRINT."

Finally the program prints the requested report, based on the user's original report selection (The REPCHOICE VAR:) The DO CASE clause decides which report to print. Note the use of the & PMACRO macro. if the user requested that the report be printed, the words TOPRINT will be added to the Report or label command lines, thereby printing the out-put. If the printer is not selected a blank space will be substituted into the end of the LABEL and REPORT commands, and the output will be directed to the screen.

To keep the report from disappearing from the screen too quickly (if the report was not printed). The program pause before returning control to the main menu. The filter is deactivated (so all records become accessible); and the normal index files are reactivated.

TRANEDIT.PRG: EDITING RECORDS.

The TRANEDIT.PRG Command files allows the user quick and easy access to records for editing. Examine the PSEUDOCODE for TRANEDIT.PRG.

COMMAND FILE NAME: TRANEDIT.PRG.

PURPOSE: locate and modify a record PSEUDOCODE:

- Set up loop for editing records;
- Ask for last name of Route to look up;
- If no name entered return to main menu;
- Convert lookup to uppercase to match index file;
- Try to find requested name;
- Count how many records have requested name;
- If no records have that name, ask the user to try again;
- If several records have that name get more information;
- If record identified, display it on custom screen
- Allow edits until exit requested.
- Return to main menu.

See TRANEDIT.PRG appendix..; this program demonstrates many basic programming techniques for quickly accessing data through index files. The program starts with the usual opening comments, and description. a DO WHILE loop controls a logical variable named ROUTES.

Within the loop the program creates a character variable named lookup, which is exactly fifteen spaces long (the same length as the INTST field in the TRANDATA.DBF dBase). An @, SAY, GET READ combination then ask sthe user to type the last name of the routes record to be edited.

If the user does not enter a name but press return, the program is signalled that the user is finished editing, and therefore return control to the main menu, it accomplishes this task by setting the ROUTES variable (which control the DO WHILE loop) to false (F) and by forcing the program to pass control directly to the ENDO Command (loop).

If the user does not request to exit, then the program lookup the name that the user entered. First remember that when we created the TRANS.DNX index. We used the UPPER function to convert all routes to uppercase for consistency. So here, the program can convert the user's entry to uppercase. Therefore we need not to be concerned about how the user enters the routes to look up.

Next the programm attempts to quickly find the requested last route in the TRANS.NDX index file which is always active in this system). The program records the number of the record where the SEEK positions the pointer in a variable named RENUMB.RECNUMB will come in handy later in the program for quickly getting the pointer back to the record to edit.

Next the program counts how many records contain the requested last route using COUNT Command. Because the database is in alphabetical order by last town, due to the TRANS.NDX index file, the faster WHILE option can be used rather than the slower FOR option. Note that the result of the following count command are stored in a memory variable named how many.

If the route that the user entered is not in the database, then the program displays an error message beep, (the ? CHR(7) line), and waits for the user to press any key, to continue. The &LOOKUP enclosed in quotation marks is a macro that will display the invalid last routes when the program runs. The IF clause handles the situation when the user enters a name which is not in the dBase.

If several records contains the last routes entered by the user, the program need more information. so first it clear the screen and then it seeks the first record in the database with the requested last routes, (The COUNT command above moved the pointer, so now it has to be repositioned). A LIST command list all individual with the requested last name (including record number), and @, SAY, GET, READ combination ask the user to select a record by typing its number. The IF clause handles situations.

By this time one of two possible condition exist. Either a record has been identified to edit, and its number is stored in the RECNUM variable, or no record has been defined, and the RECNUM variable equal Zero. If a record has been identified the program set up the TRANSCRN.FMT format-file and allows the user to edit.

When the user stops requesting records to edit, the program fails out of the DO WHILE loop and returns control to the main menu, as shown in the closing line of the program.

TRANDEL.PRG: DELETING RECORDES.

The TRANDEL.PRG command file is similar to the TRANEDIT.PRG command file, in that, it call up a record for a specific task to be performed by the user.

The PSEUDOCODE for TRANDEL.PRG below and the program in appendix....;

COMMAND FILE NAME :TRANDEL.PRG

PURPOSE: locate and delete a record

PSEUDOCODE:

- Set up loop for deleting records;
- Ask for last route of operation to delete;
- If no route entered, return to main menu;
- Convert lookup to uppercase to match index file;
- Try to find the requested route;
- Count how many route hare requested name route.
- If no records contain that name, get more information;
- If record identified, ask for permission to delete it;
- If permission granted, mark the record for deletion
- Allow more deletions until exit requested.
- Count how many record are marked for deletion;
- Display records marked for deletion;
- Ask for permission to permanently delete;
- If permission not granted;
  Allow user to recall one record;
- Decrement counter of deleted records;
- If permission to delete is granted.
- Pack the database.
- Continue displaying and asking for permission until granted.
- Return to main menu.

The basic technique for pinpointing a record to delete is identical to the technique used by TRANEDIT.PRG to locate records. However when a record is pinpointed this program does not allow editing. instead, it simply shows a portion of the record and ask for permission to delete it. If the user enters Y to delete the record, the DELETE RECORD Command marks the record for deletion.

Before returning to the main menu, the program verifies all the deletion by given the user a chance to reconsider. First the program counts the number of records that are marked for deletion and ask the user to recall a record (by record number) and then displays the remaining records that are marked for deletion and again allow the user to verify. This Process continues until there are no more records marked for deletion (NODELS = 0). One record are verified for deletion the pack command removes them from the database permanently. Because it takes some time to pack the database and rebuild the index files, the SET TALK ON Command is used to display messages about dBase's progress during this phase. When packing is complete, the TALK parameter is turned back off and control is passed back to the main menu in the program closing routine.

TRANDUPE.PRG: CHECKING FOR DUPLICATIONS:

The TRANDUPE.PRG command file displays records that have identical codes, type, streets and routes or last town.

PSEUDOCODE for the TRANDUPE.PRG Command file is shown and the the program in appendix.

COMMAND FILE NAME: TRANDUPE.PRG.

PURPOSE: CHECKS for duplicates routes and number of setter,

PSEUDOCODE:

- Ask about printer;
- Display opening message and pre-sort the dbase.
- If printer requested turn it on;

- Print report title;
- Loop through the database;
- Look to ROUTE + RATE - SETTER
- Skip to next record, and compare ROUTE + RATE + SETTER to previous record.
- If record match
- Go back to first matching record;
- Display all record that match;
- Continue loop through database;
- When done with report, handle printer or screen;
- Erase temporary index file and
- Reactivate normal sort orders
- Return to main menu.

To facilitate checking for duplicate records. The program pre-sorts the database by route code, rate and setter. That Way any records with that one identical within these three fields will be right next to each other. The sorting is handled with an INDEX Command using an index file named TEMP.NDX. The opening lines of the program ask the user if the resulting report should be printed, and create the TEMP.NDX index file.

If the user requested that the report be printed, the following routine turns the printer on, (NOW SET PRINT ON send all output commands except @, to the printer, use SET DEVICE TO PRINT).

Next the program prints the current date and time (The DATE(), TIME() Line), and a report title followed by a blank lines.

Next a loop is set up that reads every record in the database, starting at the first record (Top).

Within the loop, the uppercase (used for consistency) equivalent of the Rate, Route, and setter are stored in a memory variable named COMPARE.

Next a SKIP Command moves the printer to the next record, and an IF clause determines wether or not the Route, rate and setter of the new record are identical to the route, rate and setter of the previous record.

If the two records match, the program skip back to the previous record and list all record with identical Route, rate and setter.

This process continues until the end of the file is encountered. If the report is printed, the EJECT command moves the paper in the printer to the next page and turns the printer off. If the report was displayed on the screen, the program pauses to allow the user to view the screen before returning to the main menu these task are handle in the routine program.

Finally before returning to the main menu, the following routine closes all open database and index files, erases the temporary index file (TEMP.NDX) from the disk and sets up the normal and ROUTES and RATE.NDX index files.

4:4 **PROGRAM DEFINITIONS:**

computer techniques are important here because linear case has been fully analysed by the mathematicians; the subject as a whole is called MATHEMATICAL PROGRAMMING. It should be noted that the `Programming'. in this context does not mean computer programming, although computer programs are often used in solving mathematical programming problems.

A program is written which behaves in a similar way to the simulated system. The simulation may be that of an existing system (e.g the flow of a traffic through a road network) which is undertaken to try to understand how it behaves and how it might be controlled, whose behaviour can be examined without the cost and perhaps the risk found in `live' experiment.

An example of a system which is chosen to be analyse mathematically is the following Niger state Transport authority problem. The authority has several vehicles and a number of routes and also knows the frequency of passengers throughout each day if the passengers are served on a `first come first served' basis; the management want to know how the system behaves, and if the system is stable, if the queue will grow without limit, are more routes needed and if so how many, how should the booking clerks be organised into a shift system? what is the maximum time a passenger will have to wait and so on; Using a simulation based on empirically observed frequency distributions of occurance of certain event the management can experiment with different factors within his control and arrive at an informed and effective solution. Several HIGH-LEVEL languages have been developed specifically to help the writing of simulation programs.

4:5 CODING:

As a means of further reducing the amount of data to be recorded and processed, abbreviated codes are often used to condense the data. The Technique of converting data to symbolic form has been used in many fields as a means of saving time, effort and space and as a convenient device for identifying and distinguishing data.

The most familiar types of codes used to express words or ideas are the ALPHABETIC, which consists of letters; the NUMERIC, in which numbers are used and the ALPHANUMERIC, which uses the combination of both numbers and alphabetic Characters. The designation of units of vehicles in the Niger State Transport Authority (NSTA) as type A20,B25,C5,etc is an example of the use of alphabetic code. Examples of the use of numerical codes include record numbers bank account, and social security numbers.

4:6 **FILE MAINTENANCE:**

To perform basic file maintenance: highlight Tools from the main menu bar, and select one of these option SET DRIVE, COPY FILE, DIRECTORY, RENAME, ERASE, LIST STRUCTURE IMPORT OR EXPORT.

To group files by a particular type of application, use of SET CATALOG command at the dot prompt, or use the SET UP and CATALOG options from the assistant menu.

To create Queries that you can save and reuse. Complete the query forms using the query option under the CREATE OR MODIFY menu. To activate a QUERY, select the QUERY option under a set up menu.

For maximum speed in searching a database, open an index file of the field that you want to search. Use the SEEK option from the POSITION MENU. Then use the BUILD a SCOPE CONDITION option UNDER RETRIEVE menu to build a WHILE condition.

4.6 **DEBUGGING:**

There are Set of options that we can use to help pint point an error in a program. The SET commands makes it possible to see a program in a line-by-line fashion. So we can watch the logical flow of events. Four Set of commands are useful in debugging, TALK, ECHO, STEP, AND DEBUG.

SET TALK ON: In the transport list system command file, you SET TALK OFF at the top of the Transportation menu program. If you eliminate this line from the command file, and SET TALK ON before we do the screen, extraneous message will be displayed on the screen. These extraneous messages can be useful for watching events as they occur in the command file. They may give clues about errors in program.

SET ECHO ON: An exaggerated version of SET TALK on is the SET ECHO ON command. This display every command line in the program as it is being processed. Thus we can see everything that the Command file is doing as it is running it goes by pre-fast, but we can slow it down considerably with SET STEP ON.

SET STEP ON: If we want to follow the logic of the command file as it is running step by step, leave ECHO ON, and SET STEP ON. The command file will be processed one line at a time. As each line is proceed we can tell the program to pause, continue or stop. Processing.

SET DEBUG ON: The option to SET DEBUG ON can also be very helpful for getting at the hard- to- find errors; when the DEBUG parameter is on; all the outputs from SET ECHO ON and/or SET STEP ON are sent directly to the printer and are not displayed on the screen without distraction from the ECHO command. On the printer, the actual lines within the command file, as well as their results; we can then study the hardcopy of the events that occurred in the program. If other attempts to find the bug field, this process will usually lead to the source of the problem. We can place any of the SET Command (TALK, ECHO, STEP, DEBUG) into the program, and thereby isolate areas for debugging.

4:7 CHOICE OF PROGRAMMING LANGUAGE:

DBASE 3 plus copy and Append from commands allow us to intract with data from word processor, multiplan, spread sheet and Lotus 1-2-3. The IMPORT and EXPORT commands allows interactive with spread sheet FILE data. Many program such as Framework, symphony have their own options for interacting with dBase data.

We can interact dbase III plus data with a - verity of packages. To copy a dbase file visicale format use the dbase and enter the Command.

COPY TO (fn) TYPE DIF (enter)

where (fn) is the name of the new file dBase will add the ext DIF to the Imported file.

To export data to multiplan spread sheet use the SYCK option with the copy command.

COPY TO <fn> TYPESYCK (enter)

again, the file being exported must be in use before issuing the Copy Command. The copies file will not have an extension.

To copy data to Lotus 1-2-3 format use the WKS option with the COPY command.

COPY TO <fn> TYPE WKS (enter)

The new file will have the extension WKS.

CHAPTER FIVE:

RESULTS AND CONCLUSIONS:

5.1: ANALYSIS OF RESULT:

This study has been limited to analysing the impact of NSTA Transport routes. The study also probes the problems of (NSTA) Transport system. These research question provided a background for the following research objective namely:-

1. To analyse the development of modern mass transportation in the study area;
2. To asses the role of mass transport development and problems;
3. In the light of some findings, to make suggestions and recommendations for future improvement.

Finding shows that after Minna's change from a divisional headquarters to a State Capital, a renewal programme to make the capital play its role as a State Capital by caring for the welfare of the people and creating access road to places.

Present Transport Routes:-

From the research finding, some roads which were uncared were up graded, widen and reconstructed-also discovered was the two line road cuting across the town which was constructed to a dual carriage way. The level of crossing on the two lane road was replaced with a fly-over. Transport project was also assessed in the study was discovered that mass transportation helped provide social service to alleviate the suffering of the public. When Lt. Col. Lawal Gwadabe became the governor in 1988, the Mass Transport System begin operation and charging half the fare of taxi's. Another transport body is the Nigerian Union of Road Transport Workers (NURTW) whose level of service and rate is un-satisfactory especially when the drivers refuse to ply certain routes and charged high rate of fares.

The findings have also shown that with the up grading of roads within and linking the town outside has opened up locational advantage and its potential for growth with the fact of less competition in many fields, has been taken advantage.

Our finding also shows that earlier problems encountered in the early stage of development in Minna been improved upon by the development programme which has up-graded and has provided transport facilities, though some problems are yet to be solved these include:

- No time schedule for arrival of vehicles at bus stop;
- High fare charged by taxi drivers;
- In adequate parking facilities;
- Lack of maintenance.

5.2: **CONCLUSION:**

From the findings, it is quite obvious that transport development plays an important role in the development process of Niger State. It developmental impact is that it caused the first settlement to take place in form of camps and went on to bring people into the town and it also facilitated other ingredients of development to operate effectively.

From the study, it is shown that imbalance in the distribution of public services and commercial activities will affect the distribution of traffic flow. The volume of traffic is greater in areas with these activities. It is true that transport development creates economic opportunities where they pass through. but if the economic opportunities are positively responded to by the government and inhabitants would lead to rapid development. However, it is also asserted that the construction of roads through lands devoid of any development, does not create any development. this is because there should be people in such regions to respond to the economic opportunities that might be created.

Finally, this study has also shown that for an area to develop, they have to be first and foremost accessible regions of greater economic and social interactions. This study has also revealed that transport development alone cannot create development, but must work vis-avis other factors to bring any desired development.

5.3: **RECOMMENDATION:**

The finding have revealed an imbalance in public services. The public services are concentrated in the central business district and that's the reason for high concentration of people in these areas. The government should try to add more buses and distribute public services to parts of the town especially those routes that taxis charged high rate and do not ply; this will help reduce population concentration of activities in the central area.

Second our finding also revealed that there is in adequate parking space especially in areas like the Mobil Station. To this it is recommended that the small market within the NSTA Mobil Station be removed out of the present centre to provide enough parking space. If this is difficult to achieve, then they should move to their permanent sites.

Thirdly the finding have similarly shown that there is lack of ideal bus-stop and passengers suffer from wether effects, to this bus-stop should be built at strategic points that will help reduce the burden on the road and that would be convenient for both the pedestrian i.e sheltered and protective bus-stop from weather factors should be built.

On the issue of high fare charges by the taxi drivers, finding revealed that one can not fix transport fare for taxi; it is impossible for it to succeed.

Finally the inefficiency of Niger State Transport Authority system in terms of no time schedule would cause alot of waiting.

APPENDIX 1: PROGRAM AS WRITEN:-

```
********** TRANS.PRG
********** TRANSPORTATION SYSTEM: DBASE III PLUS.
*******------- Set up Initial parameters.
SET TALK OFF
SET STATUS OFF
SET DEFAULT TO BE
*--------- open the database and index files.
Use TRANDATA INDEX TRANRATE, TRANROUTE
*-----Begin loop for main menu.
CHOICE =  0
DOWHILE CHOICE <  > 5
CLEAR
TEXT
     1
     2
     3
     4
     5
END TEXT
*----- Get user choice
@ 16, 20 SAY "Enter choice" Get Choice
Picture "9" RANGE 1,6
READ
*__________Branch to appropriate task or program.
DO CASE
CASE CHOICE = 1
SET FORMAT TO TRANSCRN
APPEND
CLOSE FORMAT
CASE CHOICE = 2
```

```
DO TRANREPS
CASE CHOICE = 3
DO TRANEDIT
CASE CHOICE = 4
DO TRANDEL
CASE CHOICE = 5
DO TRANDUPE
END CASE
END DO (While choice <  >  6)
*________done with program to dot prompt.
SET TALK ON
SET STATUS ON
RETURN.
APPENDIX 2:-
********TRANREPS.PRG
*________Report program for Transportation system.
*_______Clear the screen and ask which report.
CLEAR
TEXT
Select a Report Option.
1.   directory
2.   Transportation labels
3.   Return to main menu.
ENDTEXT
*_______Initialize variable and ask for report choice.
REPOHOICE = 0
@14,20 SAY "Enter Your Choice (1-3)"
READ
____If return requested return to main menu.
```

```
IF REPCHOICE = 3
RETURNS
ENDIF
*_____Ask about sort order.
CLEAR
TEXT
Select a sort order
1.   Alphabetical order by Name;
2.   Route code order;
3.   Original order.
ENDTEXT
*_____Initialize variable and ask for sort choice
SORT CHOICE = 0
14,20 SAY "enter your choice (1-3)"
GET SORT CHOICE PICTURE "9" RAW 1,3
READ
*____Use appropriate index file.
DO CASE'
CASE SORTCHOICE = 1
SET INDEX TO TRANRATE
CASE SORTCHOICE = 2
SET INDEX TO TRANROUTE
CASE SORTCHOICE = 3
CLOSE INDEX
ENDCASE
*_____Ask about query
CLEAR
QCHOICE = "A"
10,5 SAY "Do you want all records or a (Q) query?"
GET QCHOICE PICTURE "1"
READ
```

```
*____Display query form if requested.
IF QCHOICE = 0
MODIFY QUERY TRANGEN
SET FILTER TO FILE TRANGEN
ENDIF
*_____Ask about the printer
PMACRO =  "     "
TORPINT = "N"
CLEAR
10,5 SAY " Send report to printer? (Y/N)"
GET TOPRINT PICTURE "1"
READ
*____Make a macro if printer requested.
IF TOPRINT = "Y"
PMACRO = "TO PRINT"
ENDIF
*_______Now print the report.
DO CASE
CASE REPCHOICE = 1
REPORT FROM NEWDRIEC $ PMACRO
CASE REPCHOICE = 2
LABEL FORM TRANLAB $ PMACRO
ENDCASE
*_____If printer was not selected, pause
*_____ Before returning to menu.
IF TOPRINT <   >  "Y"
@ 24,1 CLEAR
WAIT "Press any key to return to menu..."
ENDIF
*_____When report is donme set filter and
*_____ Index files back to normal and then
*_____ Return to main menu.
```

```
SET FILTER TO
SET INDEX TO TRANRATE, TRANROUT
RETURN.
APPENDIX 3
***************TRANEDIT.PRG
* Look up and edit Names on the TRANDATA DBASE.
*_____ Set up loop for editing records.
ROUTE = `T'
DO WHILE DAILY; D
*_____Ask for the name of Route to look up.
CLEAR
LOOKUP = SPACE(15)
@ 10,12 SAY "Enter last Name of Route to edit".
@ 12,12 say "Or just press return to exit".
GET LOOKUP
READ
*_____If no name entered, skip all commands.
*_____Between here and enddo.
IF Lookup =  "    "
ROUTES = F
Loop
ENDIF (Lookup = "  ")
*____Convert lookup to uppercase to match.
*_____ Index file
LOOKUP = UPPER (Lookup)
*___ Try to find requested name and
*____ remember record number.
SEEKLOOUP
RECNUMB = REC NO ( )
*____ Count how many there are.
```

```
COUNT WHILE UPPER (Route) = Lookup To HOWMANY
*____If no record has that name.
*_____ Ask the user to try again
IF HOWMANY = 0
@20,10 SAY "There is no # Lookup".
@22,10 SAY "Press a key to try again".
? CHR (7)
WAIT   "  "
RECNUMB = 0
ENDIF (HOWMANY = 0)
* If more than one record has that
*_____Last name get more information.
IF HOWMANY > 1
CLEAR
RECNUMB = 0
SEEK LOOKUP
LIST RATE, TYPE, SETTER, TOWN:
WHILE UPPER (L TOWN) = Lookup
@ROW ( ) + 3,10 SAY "Edit which Record #?".
GET RECNUMB PICTURE "9999"
READ
ENDIF
____If there is a record number greater than
_____Zero at this point edit the recor.
IF RECNUB > 0
GO TO RECNUMB
SET FORMAT TO TRANSCRN
READ CLOSE FORMAT
EDIF
ENDDO (While)...)
RETURN.
```

APPENDIX 4:

```
**************** Set up loop for Deleting record
STILATID = T
DO WHILE STILLATIT
*______Ask for last route to look up
CLEAR
LOOKUP = SPACE (15)
@10,12 SAY "Enter last route to delete".
@12,12 SAY "Or just press Return to exit".
GET lookup
READ
*_______If no route entered skip and commands
*_______between here and Enddo
IF LOOKUP = "   "
STILLATIT = F.
LOOP
ENDIF (Lookup = "   ")
*_____Convert lookup to uppercase to match
*____Index file.
LOOKUP = UPPER (Lookup)
*____Try to find requested route and
*_____remember record number
SEEK RECN( )
*____count howmany there are
COUNT WHILE UPPER (LROUTE = LOOKUP TO HOWMANY)
*____If no record has that name warn.
*____The user to try again.
IF HOWMANY = 0
@20,10 SAY "There is no # Lookup"
@ 22,10 SAY "Press a key to try again".
? CHR(7)
```

```
WAIT
RECNUMB = 0
ENDIF (HOWMANY = 0)
*_____If more than one record has that
*___last name (route) get more information.
IF HOWMANY > 1
CLEAR
RECNUMB = 0
SEEKLOOKUP
LIST ROUTE, RATE; TYPE; SETTER;
WHILE UPPER (LNAME(ROUTE)) = LOOKUP
@ROW( )  3,10 SAY "Delete which one?".
GET RECHNUMB PICTURE "9999"
READ
ENDIF
*____ If there is a record number greater than
*____Zero at this point, double check then delete.
IF RECHNUMB > 0
GO TO RECNUMB
CLEAR
DISPLAY ROUTE, RATE, TYPE, SETTER
?
WAIT "Delete this record? (Y/N)" TO ANSWER
*____ If answer is yes
*____mark record for deletion.
IF UPPER (ANSWER) = "y"
DELETE RECORD RECNUMB
ENDIF (RECNUMB > 0)
ENDDO (while STILLATIT)
*____Before exiting, verify deletions and pack
count for deleted ( ) to nodules
ok to pack = "N"
```

```
do while ok to pack = "N". and nodules > 0
clear
? "Records to be deleted...."
?
DISPLAY ROUTE, RATE, TYPE FOR DELETED ( )
@ 23,1 SAY "Delete all these? (Y/N);"
GET OKTOPACK PICTURE "1"
READ
IF OKTOPACK < > "y"
*____If not ok to pack, recall a record.
DECREC = 0
@23,1 SAY "Recall which one (by record#)"
GET DECREC PICTURE "9999"
READ
*______ If record number entered and record
*______ is indeed deleted recall it.
IF DECREC > 0
GO TO DECREC
IF DELETED ( )
RECALL RECORD DECREC
NO DELS = NODULES - 1
ENDIF (deleted)
ENDIF (DECREC > 1)
ELSE
*____ If ok to pack, do so and show progress.
SET TALK ON
PACK
SET TAK OFF
ENDIF (OKTOPACK)
ENDDO (OKTOPACK)
RETURN.
```

APPENDIX 5

```
**************TRANDUPE.PRG
*______Transportation system check for duplicates program
*_____Ask about printer
CLEAR
TOPRINT = "N"
10,10 SAY Send duplicate to printer? (Y/N)"
GET TOPRINT PICTURE "1"
READ
*_____Display opening messages and show progress
15,10 SAY "Pre-sorting for duplicate check..."
SET TALK ON
USE TRANDATA
INDEX ON UPPER (ROUTE + RATE + SETTER) TO TEMP
SET TALK OFF
CLEAR
*____of printer requested, turn it on.
IF TOPRINT = "Y"
SET PRINT ON
ENDIF
*____ Print report title
CLEAR
DTO (DATE ( ) ) + SPACE (20)   "Possible Duplications"
?? SPACE (20) + TIME ()
?
?
*__ Loop through the database.
GO TOP
DO WHILE. NOT. E OF ()
Compare = UPPER (ROUTE +RATE + SETTER)
SKIP
```

```
IF UPPER (ROUTE + RATE + SETTER) compare
SKIP - 1
LIST SETTER, ROUTE, TYPE, RATE WHILE:
UPPER (ROUTE + RATE + TYPE + SETTER) = Compare
?
?
ENDIF (UPPER ROUTE +....)
ENDDO (not e of)
*____Done with report, handle printer or screen.
IF TOPRINT = "Y"
EJECT
SETPRINT OFF
ELSE
@ 23,1
WAIT "Press a key to return to the menu...."
ENDIF (TOPRINT)
*_____Erase temporary index file and
*___reactivate normal indexes.
close databases
erase temp.ndx
use trandata index tranrte, tranrate.
```

REFERENCE

Alan Simpson - dBase III+; Planning, design and Programming.

DR. K.R. ADEBOYE - Operations Research,
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