Active

Project #: E-20-X07   Cost share #:   Rev #: 1
Center # : 10/24-6-R7499-0A0 Center shr #:   OCA file #:
                                                              Work type : RES
Contract#: SIGNED AGREEMENT DATED 4/13/92 Mod #: 1   Document : CONT
Prime   #:   Contract entity: GTRC

Subprojects ? : N   CFDA:
Main project #:   PE #:

Project unit: CIVIL ENGR   Unit code: 02.010.116
Project director(s):
    MEYER M D   CIVIL ENGR   (404)894-2236

Sponsor/division names: EBASCO SERVICES INC   /
Sponsor/division codes: 254   / 001

Award period: 920215   to   930930 (performance)   930930 (reports)

Sponsor amount   New this change   Total to date
    Contract value   0.00   111,000.00
       Funded   0.00   111,000.00
Cost sharing amount   0.00

Does subcontracting plan apply ?: N

Title: PROJECT MGMT SUPPORT FOR COBB COUNTY DOT TRANSPORTATION IMPROVEMENT PROGRAM

PROJECT ADMINISTRATION DATA

OCA contact: E. Faith Gleason   894-4820

 Sponsor technical contact   Sponsor issuing office

 WILLIAM S. WEIKEL   G. V. NIELSEN
 (404)231-9211   (404)231-9211

 EBASCO INFRASTRUCTURE   EBASCO INFRASTRUCTURE
 SEVEN PIEDMONT CENTER, SUITE 305   SEVEN PIEDMONT CENTER, SUITE 305
 ATLANTA, GEORGIA 30305-1530   ATLANTA, GA 30305-1530

Security class (U,C,S,TS) : U   ONR resident rep. is ACO (Y/N): N
Defense priority rating   : N/A   N/A supplemental sheet
Equipment title vests with: Sponsor   GIT
   NONE PROPOSED NOR AUTHORIZED.
Administrative comments -
SUPPLEMENTAL AGREEMENT NO.1 EXTENDS THE PERIOD OF PERFORMANCE TO 9/30/93 AND
INCLUDES THE NEW ADDRESS FOR THE SPONSOR, EBASCO INFRASTRUCTURE.

NOTICE OF PROJECT CLOSEOUT

Closeout Notice Date 02/14/95

Project No. E-20-X07_____   Center No. 10/24-6-R7499-0A0_

Project Director MEYER M D_____   School/Lab CIVIL ENGR_____

Sponsor EBASCO SERVICES INC/_____

Contract/Grant No. SIGNED AGREEMENT DATED 4/13/92   Contract Entity GTRC

Prime Contract No. _____

Title PROJECT MGMT SUPPORT FOR COBB COUNTY DOT TRANSPORTATION IMPROVEMENT PROGR

Effective Completion Date 930930 (Performance) 930930 (Reports)

	Y/N	Date Submitted
Closeout Actions Required:		
Final Invoice or Copy of Final Invoice	Y	_____
Final Report of Inventions and/or Subcontracts	Y	_____
Government Property Inventory & Related Certificate	N	_____
Classified Material Certificate	N	_____
Release and Assignment	N	_____
Other _____	N	_____

Comments_____
_____

Subproject Under Main Project No. _____

Continues Project No. _____

Distribution Required:

Project Director	Y
Administrative Network Representative	Y
GTRI Accounting/Grants and Contracts	Y
Procurement/Supply Services	Y
Research Property Managment	Y
Research Security Services	N
Reports Coordinator (OCA)	Y
GTRC	Y
Project File	Y
Other _____	N
_____	N

NOTE: Final Patent Questionnaire sent to PDPI.

To: William Weikel
        EBASCO, Inc.

From: Michael D. Meyer
        School of Civil Engineering
        Georgia Tech

Date: July 1, 1992

Re: Progress Report for Cobb County Project $E20 - X07$

This memo constitutes a progress report for the period of project beginning, mid-April to July 1, 1992. Further progress reports will be done monthly. This larger period for the first progress report results from transition problems of knowing when the project actually began.

For this period, the following progress has been made:

Task 1: Evaluation of Prototype GIS

Meetings were held with Cobb DOT units to determine most appropriate structure of GIS. In addition, a meeting was held with the Director of Cobb DOT and his staff to organize an internal management review committee. Task Completion: 80%

Task 2: Digital Database

Data has been collected for several of the modules in the GIS. Meetings have been held regarding accident records and traffic signal data. Task Completion: 20%

Task 3: Applications

The intersection database manager is 80% complete. The interface between TRANSYT-7F and the GIS is 50% complete. No work has started on TRANPLAN. Task Completion: 20%

Tasks 4 - 8: Not yet started

To: William Weikel   *E 20-x07*
             EBASCO, Inc.

From: Michael D. Meyer
             School of Civil Engineering
             Georgia Tech

Date: September 1, 1992

Re: Work Performed During Months of July and August

In early July the research team made a presentation to DOT staff on the status of the project. Since then, a great deal of development has occurred in the traffic engineering area. The research team has presented a preliminary design for the traffic engineering module. This presentation included a demonstration of new capabilities that were added to the original prototype. Based on an evaluation by the DOT staff, the capabilities that are determined to be most useful will be implemented as part of the final system. The research team is also currently working on an interface for the GIS with TRANPLAN. An interface has already been created from a network standpoint. A second interface will be developed to manage land use information that can be used to generate trip production and attraction information for use by TRANPLAN. The estimated progress to date is as follows:

    Task 1:   Evaluation of Prototype GIS: 90% complete

    Task 2:   Digital Database: 30% complete

    Task 3:   Applications: 35% complete

    Task 4-8:   Not yet started

A reestimated schedule for the project is attached. There is still no expected slippage from the agreed upon ending date.

To: William Weikel
           EBASCO, Inc.

From: Michael D. Meyer and Wayne A. Sarasua
           School of Civil Engineering
           Georgia Tech

Date: November 16, 1992

Re: Work Performed During Months of September and October

During the last two months, a number of meetings were held with key Cobb DOT officials to clarify functional issues with regard to the GIS-T. Based on information provided in these meetings, a great deal of development has been done in the traffic signal, accident records, pavement management and transportation planning modules. Discussions were made with MIS officials about the spatial databases that were built at the University of Georgia. MIS stated that a centerline database has not yet been developed. Thus, Georgia Tech will continue to use its TIGER based centerline database for development purposes. An updated TAZ database for the platinum triangle has been completed. This database represents the core database for the Transportation planning module. A program was written that can translate landuse information stored in the TAZ database into a TRANPLAN gravity model input file that contains trip productions and trip attractions. The estimated progress to date is as follows:

Task 1:   Evaluation of Prototype GIS: 100% complete

Task 2:   Digital Database: 60% complete

Task 3:   Applications: 50% complete

Task 4:   Building the Databases: 10%

Task 5:   Testing the Applications: 10%

Tasks 6-8: Not yet started

A re-estimated schedule for the project is attached. The overlapping task efforts are because different modules are further along than others. There is still no expected slippage from the agreed upon ending date which is in May of 1993. Presentations of various system components is planned to be done in December. At a minimum, these presentations will include the Transportation Planning module and the Pavement module.
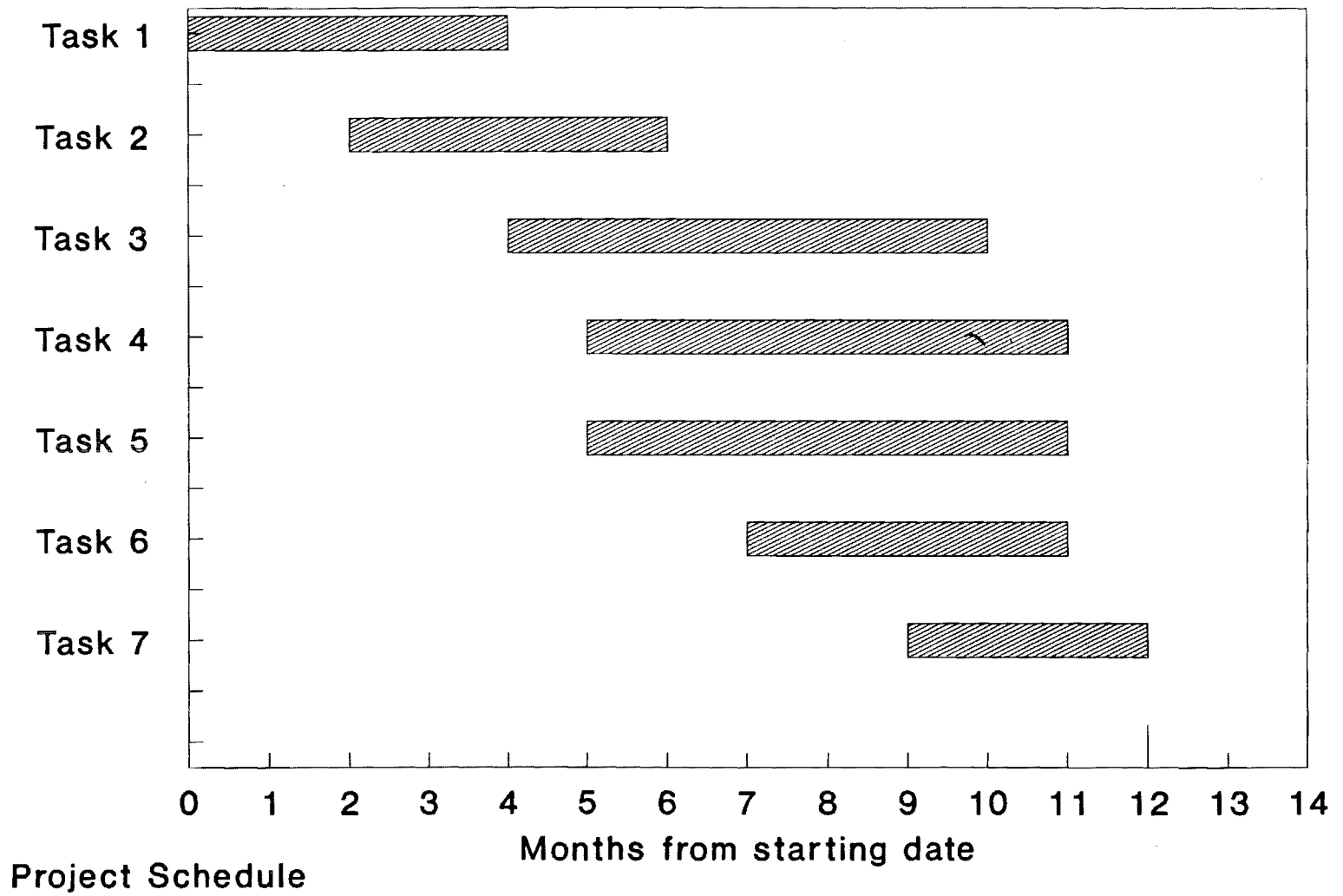
Project Schedule

To: William Weikel
     EBASCO, Inc.

From: Michael D. Meyer and Wayne A. Sarasua
     School of Civil Engineering
     Georgia Tech

Date: December 21, 1992

Re: Work Performed During November

During the month of November, a meeting was held with Cobb DOT traffic engineering staff to finalize the database design for the signal information system. We are currently waiting for some forms to be completed by DOT staff that will identify any fields not yet in the database. Once we receive the completed forms, we will be able to finalize the format of the database for the signal information system. We are also rapping up much of the development of the various applications that will be included in the GIS-T. A summary is as follows:

Traffic signal module. This is the most extensive module in terms of functionality. The system. This module is 85 percent complete, but will still require considerable development effort because of its scale.

Accident records. The interface between the GIS database and CAD works. Collision diagrams are generated automatically.

Pavement management. An input system has been developed for doing pavement evaluations in the field using a laptop computer. This system is almost complete.

Transportation planning. The interface to TRANPLAN is complete. We are currently calibrating trip rates that are used by the interface to determine trip information used by TRANPLAN.

Because of the holidays, demonstrations of the various system elements to DOT staff will not occur until January. The estimated progress to date is as follows:

   Task 1: Evaluation of Prototype GIS: 100% complete

   Task 2: Digital Database: 75% complete

   Task 3: Applications: 70% complete

Task 4:   Building the Databases: 30%

Task 5:   Testing the Applications: 20%

Task 6:   Documentation and Training: 15%

Tasks 7-8:   Not yet started

A re-estimated schedule for the project is attached. The overlapping task efforts are because different modules are further along than others. While completion of the various modules are expected to be done by the agreed upon project ending date, an evaluation period and system modifications will require an additional time period. The length of this period will depend on the extent of the modifications that are required. It is anticipated that the project will end by June, 1993. No additional funding will be necessary to complete the project.

GeorgiaTech

To: William Weikel
             EBASCO, Inc.

From: Michael D. Meyer
             School of Civil Engineering
             Georgia Tech

Date: March 4, 1993

Re: Work Performed During February

The following work was completed during the months of December and January:

Traffic Engineering Module

●   Two meetings were held with in February with Traffic Engineering staff. Modifications to the traffic engineering module were discussed and implemented. This includes the interface to Highway Capacity Software and improvements to the signal maintenance work order system. We are not interfacing the work order system with the GIS.

●   Progress continues on the GIS/TRANSYT-7F interface. Many of the major "bugs" have been removed. We are in the process of testing it and adding other features to it to take advantage of new capabilities of the latest TRANSYT release.

Accident Records

●   The interface between the GIS database and CAD works and is still being fine tuned and tested. The locating of accidents on a diagram is complex due to limited locational information. Thus, an algorithm was developed that offsets accidents slightly so that they aren't displayed on top of each other. The diagram can still become cluttered (difficult to interpret) when numerous accidents are being displayed at once. This system will be demonstrated to Cobb DOT staff in the next few weeks.

Pavement Management

●   An input system has been developed for doing pavement evaluations in the field using a laptop computer. We are currently interfacing the system with the GIS database. This system will also be demonstrated during March.

Transportation planning

● The interface with TRANPLAN was demonstrated to DOT planning staff a few weeks ago. Because of the magnitude of landuse data needed to expand this system to include the entire county, it is questionable on whether or not the system can be implemented as it stands now. Alternatively, a scaled down version of the system which would work with existing ARC data is being considered.

We are also developing documentation for the system as the project progresses.

The estimated progress to date is as follows:

Task 1: Evaluation of Prototype GIS: 100% complete

Task 2: Digital Database: 85% complete

Task 3: Applications: 90% complete

Task 4: Building the Databases: 60%

Task 5: Testing the Applications: 35%

Task 6: Documentation and Training: 35%

Tasks 7: Not yet started

Task 8: Direct support on applying the system to pavement management and signal coordination will be done upon completion of the other tasks (there is some overlap with task 7).

The project schedule has not changed. While completion of the various modules are expected to be done by the agreed upon project ending date, an evaluation period and system modifications will require an additional time period. The length of this period will depend on the extent of the modifications that are required. It is anticipated that the project will end by June unless the modifications desired by Cobb DOT staff are extensive. Fine tuning and support will continue past the June ending date. This support will be done at no cost unless major modifications are necessary.

To: William Weikel
           EBASCO, Inc.

From: Michael D. Meyer
           School of Civil Engineering
           Georgia Tech

Date: April 13, 1993

Re: Work Performed During March

The following work was completed during the month of March:

Traffic Engineering Module

●   Modifications have been made on the work order system. Querying capabilities were
     added.

●   Modifications are in the works to the GIS/TRANSYT-7F interface to make it compatible
     with the newest version of the HCM Software. The input file for the new version is
     binary rather than ASCII (previous version). Enhancements have also been made to
     SIDE (esp. the source flow generator and the geometry editor). We are also working
     on memory problems.

Accident Records

●   A great deal of fine tuning has been done to the interface between AutoCAD and the
     GIS. The modifications reflect suggestions by Russ Hamilton. We have also done some
     work on the GIS interface.

Pavement Management

●   Modifications were made to the input system for doing pavement evaluations in the field
     using a laptop computer. We are currently working on memory problems.

Transportation planning

●   The system is being expanded for the entire county. Because of limited land use info
     (platinum triangle only) the system is being modified to work with ARC data.

We are currently in the process of finishing a CAD centerline database for major streets that will be used as the graphical database for the Traffic Engineering module.

We are also developing documentation for the system as the project progresses.

The estimated progress to date is as follows:

Task 1:   Evaluation of Prototype GIS: 100% complete

Task 2:   Digital Database: 90% complete

Task 3:   Applications: 90% complete - no change because of suggested modifications.

Task 4:   Building the Databases: 60%

Task 5:   Testing the Applications: 50% includes modifications

Task 6:   Documentation and Training: 50%

Tasks 7:   Not yet started

Task 8:   Direct support on applying the system to pavement management and signal coordination will be done upon completion of the other tasks (there is some overlap with task 7).

We are currently waiting on several copies of the newest version of TRANSCAD from Caliper Corporation. Once we receive them, we will loan a few copies to the various divisions within the DOT during an evaluation period. We have put together a tutorial using Cobb Data in the use of TransCAD.

While completion of the various modules are near completion, an evaluation period and system modifications will require an additional time period. The length of this period will depend on the extent of the modifications that are required. It is anticipated that the project will end by June unless the modifications desired by Cobb DOT staff are extensive (no additional budget will be required). Fine tuning and support will continue past the June ending date. This support will be done at no cost unless major modifications are necessary.

Georgia Tech

E 20 - X07
15, 16

To: William Weikel
                EBASCO, Inc.

From: Michael D. Meyer
                School of Civil Engineering
                Georgia Tech

Project E 20-X07
Status Report

Date: June 18, 1993

Re: Work Performed During April and May

The following work was completed during the months of April and May:

Traffic Engineering Module

- Georgia Tech has completed a centerline database of the Cobb County traffic signal network that was initially being developed by Cobb County. This map database was developed in AutoCAD. The newest version of TransCAD, which we have not yet received, can convert an AutoCAD drawing into a TransCAD database. Once this accomplished, modifications will be made to make the TransCAD database compatible with the Traffic Engineering Module. There is still some software development that is going on with the Traffic Engineering module. The system has over 10,000 lines of source code.

Accident Records

- The accident record system is ready for presentation waiting receipt of the newest version of TransCAD. Once the system is modified to be compatible with TransCAD 2.1, it will be demonstrated to Cobb County.

Pavement Management

- The pavement management system was demonstrated to Cobb County staff. Cobb County is currently preparing a hardcopy map of pavement segments. Once this is complete, Georgia Tech will create a spatial database of the new segment information. Except for minor modifications, the functionality of the pavement management system is nearly complete. Additional modifications will be made after extensive field testing.

Transportation planning

- The system has been expanded for the entire county. Because of the differences between the ARC zone system and the Cobb County zone system, there have been difficulties in developing adequate equations to convert social economic data into production and attraction info. This will be ironed at with Cobb County staff. Except for this difficulty, the system is functional and ready to be demonstrated.

Because of delays in our receipt of TransCAD the system evaluation period will not begin until July at the earliest. Support will continue until Cobb County is satisfied with the four modules. Fine tuning will continue as necessary over an indefinite period. No additional budget will be required to complete the project unless major changes in system functionality are requested.

Georgia Tech

School of Civil Engineering

Georgia Institute of Technology
Atlanta, Georgia 30332-0355
USA
404•894•2201
404•894•2278 FAX

To: William Weikel   *E20-X07*
              EBASCO, Inc.

From: Michael D. Meyer   *Michael D. Meyer /v/*
              School of Civil Engineering, Georgia Tech

Date: August 10, 1993

Re: Work Performed During June and July

The following work was completed during the months of June and July

Traffic Engineering Module

● The traffic engineering module has been going through tests and numerous bugs have been fixed. The system is almost ready for delivery. We are waiting delivery of the newest release of HCS to improve system compatibility. As of today, it has not yet arrived.

Accident Records

● The system is now compatible with TransCAD 2.1. Cobb County is currently reviewing information on the Accident Record System. Once changes have been made based on Cobb County's comments, the system will be delivered. Mean while, the system is still being fine tuned and tested. A spatial database is currently being developed that includes all of the county's accident locations.

Pavement Management

● The system is near completion. Georgia Tech is still awaiting a hard copy map of pavement segments.

Transportation planning

● This system is ready for demonstration. Changes will be needed, but these will be contingent on information that will be provided by the County.

While there have been numerous delays in the system development, it is anticipated that some if not all four of the modules will be in place in Cobb County for evaluation within the next month. This will be dependant upon information still to be provided by Cobb County for the Accident, Pavement Management and Transportation Planning modules.

COBB COUNTY DEPARTMENT OF TRANSPORTATION

GIS TRAINING MATERIALS

TRANSPORTATION PLANNING MODULE

Final Report

Prepared for

Ebasco Infrastructure

November, 1994

TABLE OF CONTENTS

I. Overview

This guide is intended as a tutorial to teach the basics of using TransCAD GIS and the customized Transportation Planning Module. Section II provides installation instructions of the software that accompanies this guide. Section III (General TransCAD Training) introduces the user to a number of different TransCAD operations using Cobb County TRANPLAN network data set. Section IV concentrates on the Transportation Planning capabilities of the system.

II. Installation

This training guide is accompanied by 2 disks. Disk 1 contains the general TransCAD training material and Disk 2 contains the Transportation Planning module. Both disks contain files called *install.bat*.

To install the general training material, insert Disk 1 into your floppy drive. Change your current drive to be the one containing Disk 1 (e.g. a:). Type:

> a:\ > **install**

The install batch file assumes that TransCAD is located on the **c:** drive in the **transcad** directory. If this is not the case, you will have to modify the batch file. The sample databases for the tutorial will be located in a directory called **c:\transcad\cobbdemo**.

TransCAD runs much more efficiently if you use a disk cache program such as *smartdrv.sys*. Consult your TransCAD manual for the most optimal configuration.

To install the Transportation Planning Module training material, insert Disk 2 into your floppy drive. Change your current drive to be the one containing Disk 2 (e.g. a:). Type:

> a:\ > **install**

The install batch file will create several directories on your hard disk.

The directory structure for the transportation planning module can be obtained by reviewing the install.bat file on Disk 2. All of the directories reside under the TRANSCAD directory. Changes to the directory structure will require changes to the transportation planning application files. The application files are used at program start-up to load the necessary databases. You can modify the application files using any ASCII text editor.

III. General TransCAD Training

Starting TransCAD

To start TransCAD, first move to the directory on your hard disk in which TransCAD is installed. If TransCAD is installed on your C:\TRANSCAD directory, you would use the following commands to start and begin using TransCAD. To switch to the C:\TRANSCAD directory, type the following at the DOS prompt:

C:

C:\ > cd\transcad

Next, start TransCAD as follows:

C:\TRANSCAD > tc cobb

The word "cobb" in this command is the name of a TransCAD application file (cobb.app).

This application file is a text file that lists the boundaries of the area to display on the screen and lists the databases that can be accessed by this application.

A TransCAD title screen appears, followed a few moments later by a map. Above the map appear the names of seven menus: **TransCAD, Display, Layer, Query, Select, Geography** and **Procedure**. The seven menus you see are part of the TransCad Map Display window. You can also see a pointing finger icon on the screen. You can use the mouse to move the icon and choose menu options and commands.

Using the Menus

You can access menus using either a mouse or the keyboard. In this tutorial, you will learn how to use the mouse. First, get started by activating the TransCAD menu.

1. Move the pointer to the TransCAD menu.

2. Click and release the left mouse button.

You now see the TransCAD menu. This is a pull-down menu that presents a list of commands. When a pull-down menu is active, you can move from pull-down menu to pull-down menu or from option to option as follows:

5

1. Move the mouse down and up to highlight different commands in the pull-down menu.

2. Move the mouse right and left to display other pull-down menus.

3. Click both mouse buttons at the same time to leave the menus without choosing a command.

Using TransCAD Commands

You can access almost all of the commands and capabilities of TransCAD through pull-down menus and submenus and pop-up menus.

A frequently used command is Display Refresh, located under the Display menu. When you choose this command, TransCAD redraws the map display with any changes that you make.

1. Move the pointer to the Display menu, and click the left mouse button.

2. Note that the Refresh command is highlighted.

3. Now, click the left mouse button to execute the command.

Clicking the left mouse button has the same effect as pressing the <Enter> key. From now on, we'll say "click <left>" or "click <Enter>" when you need to click the left mouse button or press the <Enter> key.

Changing the Map Display

Now you can make the map look different by changing the geographic layers that are displayed. The map you see has eight layers--Nodes, Streets, Signal Intersections, Bus Stops, Transit Route Links, Accident Records, 1995 Developments, and TAZ Attributes. However, the application file contains other layers you can display.

1. Choose Active Layers from the TransCAD pull-down menu.

When you execute the Active Layers command, a pop-up menu appears, listing all of the geographic layers which are a part of this application (as defined by your application file).

Options that are active or inactive are toggled on and off, using the mouse.

1. Move up or down to highlight the name of a layer.

2. Click the right mouse button to turn the layer on or off.

As you click <right> on options in the menu, the block to the left of the layer name is toggled on (filled in) or toggled off (cleared).

Now, try the Active Layers command as follows:

1. Deactivate all layers except the Streets layer using the mouse.

2. Click <left> to complete the command.

3. Choose Display Refresh to redraw the map.

Now, take a few moments to experiment with the Active Layers command. Try some different combinations of layers, and see how the map looks when you refresh the display. As you experiment, note the following:

At least one layer must always be active. TransCAD will never allow you to deactivate all layers at the same time.

When the active layer menu is on the screen, you can activate all layers by pressing <Alt> A (for All). To turn off all layers except the one that is currently highlighted, press <Alt> N (for None).

Before you continue...

1. Choose Active Layers and deactivate all layers except the Street and Signal Intersections layers.

2. Refresh the map.

Changing the Current Layer

You saw earlier that any number of layers of data can be active at one time. One of the active layers is the current layer. Most TransCAD commands work only on the current layer.

The bottom line of the TransCAD screen always displays the names of the current database and the current layer. You can change the current layer using the TransCAD Current Layer command.

1. Choose Current Layer from the TransCAD menu.

A pop-up menu lists all the layers in the application. Layers that are not active are crossed out

in the menu and cannot be chosen.

2. Highlight Signal Intersections and click <left>.

The bottom line of the map display is updated to indicate the name of the current layer.

Performing a Simple Query

Behind every item which appears on the map, there is information stored in a TransCAD database. The Query One or More command displays the data for a point, line, or area in a pop-up window.

1. Choose Query One or More. (Activate the Query menu, and then choose the One or More command.)

An arrow cursor appears on the screen. Note that the longitude and latitude of the cursor are displayed at the bottom of the screen.

2. Point to one of the signalized intersections (identified by the small red square icons).

3. Click <left>.

The Signalized Intersection is highlighted, and information about the signalized intersection appears in a pop-up window.

4. Click <Esc> (that is, press the <Esc> key, or click both mouse buttons at the same time) to make the window disappear.

The arrow cursor reappears.

5. Continue to click on signalized intersections to display data, or click <Esc> to end the command.

Sometimes, a query might locate more than one item on the map.

1. Choose Query One or More, and point to a crowded part of the map where many intersections are clustered.

If the cursor is close to only one intersection, the command works as it did before. If the cursor is located near more than one signalized intersection, you will be asked to Identify the Signalized Intersection by any number of possible parameters.

Choose ID to see a list of the ID numbers of all signalized intersections near the arrow cursor.

2. Choose ID from the menu.

A pop-up menu of ID numbers appears.

3. Choose one ID number from the list of numbers.

That signalized intersection is highlighted, and the pop-up window appears as before. Spend a few more minutes performing queries and changing the active and current layers.

Changing the Map Scales

TransCAD can display a map at any scale, from a worldwide scale to the scale of a room inside a building.

Zoom In

1. Choose Scale from the Display menu.

A submenu is displayed. This submenu contains commands which change the map scale.

2. Choose Zoom.

An arrow cursor appears on the screen.

3. Move the cursor with the mouse until it is positioned at one corner of a rectangle surrounding and click <left> to anchor this point. (Remember, click <left> means to click and release the left mouse button or to press the <Enter> key.)

A rectangle appears on the map.

4. Use the mouse to stretch the rectangle to cover...

5. Click <left> to complete the zoom.

The map is redrawn showing the area you designated.

Try zooming in a few more times, aiming for one specific signalized intersection. If you zoom in too far, choose Display Scale Previous. This command restores the map to the scale and location that existed before the Scale command was used.

Once you have zoomed in, you can display a key to the map:

1. Choose Display Key.

A small window appears in the corner of your screen containing the entire Platinum Triangle area. An arrow icon appears in the small window. It is possible to use this window to zoom into some other part of the Platinum Triangle. Click <Esc> to return to your display.

Other Map Scale Commands

You can pan across the map using the Display Scale Shift Left, Shift Right, Shift Up, and Shift Down commands.

If you want to see a larger area of the map, you can use the Display Scale Shrink commands which shrink the map to the designated percentage of its current size, leaving the map centered in the same place.

Another Way of Displaying Data

So far you have only used the TransCAD Map Display window. TransCAD has five other windows which you can use to look at and analyze data. They include the Data Editor window, and Table Editor window, the Conditions window, the Charts window, and the Statistics window.

Activate the TransCAD menu, and review the windows listed below the Active Layers command. You can use commands on the TransCAD menu to move from the Map Display window to the other TransCAD windows. Right now, move to the Data Editor window.

1. Choose Data Editor from the TransCAD menu.

As you can see, the Data Editor window displays data in a worksheet format of columns and rows.

A reverse video highlight indicates the current cell, which is created by the intersection of a column and row. You can move the highlight to another cell by clicking <left> with the mouse on that cell. Or you can use the arrow keys, the <PgUp> and <PgDn> keys, the <Tab> and <Shift>-<Tab> keys, and the <Home> and <End> keys to move all around the worksheet.

Now choose Map Display from the TransCAD menu to return to the map display, and we will proceed.

Selecting Records in a Database

The commands on the Select menu let you identify, or select, a subset of the entities in the

10

current layer. Entities can be selected based on their location on the map, their location relative to entities in other layers, or their attributes or characteristics.

The collection of entities that are selected at any one time is referred to as the "selected set". Once entities are selected, you can select more entities, remove some entities from the selected set (by deselecting them), or select a subset of the entities that are currently selected. This makes it possible to combine geographic and attribute queries in a number of ways.

Start with the Select Several by Radius command. This command locates all of the entities in a database that are within some distance of a given point.

1. Make sure that Signal Intersection is the current layer.

2. Choose Select Several by Radius.

An arrow icon appears on the screen.

3. Move the icon with the mouse until it is positioned at any point near several intersections and click <left> to anchor this point. A circle appears on the screen.

4. Stretch the circle using the mouse.

The center location and radius of the circle (in miles) are displayed at the bottom of the screen.

5. To move the circle, click <right>, and move the entire circle with the mouse. Click <right> again to change the radius of the circle.

6. When the circle is the correct size and location, click <left> to complete the command.

TransCAD locates and selects all signalized intersections within the circle, and highlights them on the map display.

The spatial query could have taken minutes or even hours using a standard database manager. This illustrates one of the key differences between a GIS and standard database manager--spatial indexing. With spatial indexing, searches are performed very quickly regardless of database size.

Try one more experiment with this command:

1. Choose Select Several by Radius, but use a small circle that contains only a handful of signalized intersections.

Switch from the map display to the data editor (using the TransCAD Data Editor command).

Instead of displaying every signalized intersection, you only see the signalized intersections that were within the circle on the map.

At the bottom of the screen, the data editor indicates that you are looking only at selected cities and towns. Also, the angle brackets (> <) that surround each row of data indicate that each and every signalized intersection you see is in the selected set.

More Selection Commands

First, try the Select Clear command. This command clears away the "selected set" of records and brings up ALL records. For the opposite effect, try the Select All command--this command selects every single signalized intersection in the data layer.

You can use the <Esc> key to cancel any selection command in progress.

The Select Unselected command inverts the selected set, selecting every record that was not selected and deselecting every record that was selected.

Thematic Mapping

You saw in previous lessons that all entities you see on the map have data associated with them. TransCAD has many features that let you display these data graphically. Maps of this type are often referred to as thematic maps. Thematic maps help you understand data and convey information more effectively.

Adding Labels to the Map

First, return to the Map Display.

1.   Activate the Layer menu.

This menu contains commands that affect the way in which the current layer is displayed.

2.   Toggle the Labels command by clicking <right> or pressing <Space>. The prompt at the bottom of the screen asks to enter a label. Instead, press the @ key to bring up a pop-up menu that lists all attributes associated with each signalized intersection.

3.   Choose Inter LOS (which stands for Intersection Level Of Service based on a

lettering system from A - Very Good traffic flow...to F - Very Poor traffic flow) from the pop-up menu. This is the data field we will use to label the map.

TransCAD does not allow labels to overlap on the map display, therefore some intersections may not be labeled. To determine which WILL appear you must determine their "priority".

4. Choose an attribute to determine how they will be prioritized.

5. Now pick "ascending" or "descending" and refresh the map.

Your signalized intersections are now labeled with specific LOS or Level Of Service which is currently experienced at each intersection.

6. Once you have done this, turn the labels back OFF by toggling the labels box to empty under the Layer menu.

Creating a Thematic Map

A common type of thematic map uses colors to distinguish areas with different characteristics. This kind of a map is also known as a chloropleth map. We will now create one.

To accomplish this, you will create a theme. A theme is a classification of entities in a layer, based on the value of any one attribute. When you create a theme, you also choose colors, styles, and/or icons that are used to distinguish the classifications on the map display.

Use the Layer Themes Create command to create a theme.

To create a theme:

1. Choose Layer Themes Create.

A dialogue box appears on the screen, along with a pop-up menu that lists all of the data fields in the signalized intersection layer.

2. Choose Inter. V/C (for Intersection Volume to Capacity ratio) from the list of data fields.

3. Choose Fixed Interval as the classification method.

4. Choose the Standard palette.

5. Choose None for the style settings.

13

The dialogue box shows the four choices you have made.

     6. Move the highlight to Interval (use the mouse or arrow keys) and click <left>.

A second dialogue box appears, with spaces for you to enter a minimum value, a maximum value, and an interval.

     7.   Set the minimum value to 0.85, the maximum value to 1.25, and the interval value to 0.05.

     8. Move the highlight to Go and click <left> to finish creating the theme.

     9. Finally, use Display Refresh to redraw the map.

The map display now shows each intersection color coded by its intersection volume to capacity ratio. To understand what the colors mean, display the map legend (if it is not currently on the screen).

     1. Choose Display Legend Show.

A map legend appears on the screen showing the meaning of each color and the scale of the map.

Modifying the Legend

You might want to change the size or location of the legend.

     1.   Choose Display Legend Reshape to change the shape of the legend.

     2.   Move the mouse up or left to make the legend taller and narrower, or move the mouse right or down to make the legend shorter and wider.

     3.   Click <Enter> when you are done.

Now move the legend to a different place.

     1.   Choose Display Legend Move.

     2.   Use the mouse or the arrow keys to move the legend to a different location.

     3.   Click <Enter> when you are done.

You can also hide the legend using the Display Legend Hide command.

Creating a Theme for Street Pavements

    1. Clear the Labels and make Streets the current layer.

    2. Choose Layer Themes Create.

The theme dialogue box appears.

    3. Choose Total Score as the data field.

    4. Choose Fixed Intervals from 0 to 100 using Intervals of 10.

    5. Choose the Standard palette, and None for style.

    6. Click Go and refresh the map.

Each street segment is color coded by its Total Pavement Score (which shows what type of "shape" the pavement is in - Higher numbers are worse!). You may need to zoom in on one region of the map to see the theme more clearly. You might also try to change the legend shape and location to make the map more presentable.

Scaling the Width of a Line

Just as you can use different icons to display points, you can use different widths to display lines or boundaries. You can emphasize a layer by drawing it with a wider line.

    1. Choose Layer Line Width.

A submenu appears with three options. The Fixed Width option is currently active.

The Fixed Width option lets you set a line width from 1 to 5, where 1 is narrow and 5 is wide.

    2. Click <right> on Fixed Width to change the line width.

    3. Enter 2 at the prompt in the Message bar and press <Enter>.

    4. Refresh the screen.

The colors in the theme stand out much more clearly when the line width is increased.

Now, return the line width to 1 using the above same commands.

Creating and Using Conditions

You need to learn how to select records in a layer based upon the value of one or more attributes. You will also learn how to combine spatial selection with queries based on attribute values.

What is a Condition?

A condition is a logical statement about entities in a database that is based on the value of a single attribute or data field. Conditions are used to select records based on these attribute or data field. Conditions are used to select records based on these attribute values--for example, all signalized intersections with volume to capacity ratios greater than 1.5.

To create or edit conditions, you use the Condition window. Make sure the Signal Intersections layer is current.

    1. Choose TransCAD Conditions to switch to the Condition window.

As you can see, several conditions have already been created for this layer. Each condition has a name, a data field, an operator, and a value. You enter conditions in the condition editor by,

        -typing a name for the condition
        -choosing a data field from the pop-up menu
        -choosing an operator from the pop-up menu
        -entering a value to use in the condition

You can define up to 32 different conditions for each layer. These conditions are stored in the database, and can be used at any time. When you use a condition, you refer to it by name.

Now, you can use a few of these conditions.

    1. Choose TransCAD Map Display to return to the map display.

    2. Choose Select Several on Condition.

You can select entities based on a single condition, on a union of conditions, or an intersection of conditions. For now:

    3. Choose to use One Condition.

A pop-up menu lists the names of all conditions that are stored in the database.

    4. Choose Inter. V/C > 1.25.

5. Refresh the Map Display.

Combining Conditions and Spatial Queries

You can combine some conditional queries with spatial queries using the Select Subset command. Select Subset finds the subset of the currently selected records that meet some other conditional or spatial selection.

1. Return to the map display, zoom into an area of about 5 intersections and choose Select Clear to clear the selected set.

2. Choose the Select Several command.

3. Click <left> on by Radius, and draw a circle enclosing all of the signalized intersections seen in your zoomed in screen.

TransCAD selects all highway segments that are completely within the circle.

4. Choose Select Subset on Condition.

5. Choose One Condition.

6. Choose INTER DELAY > 120 from the pop-up menu.

TransCAD examines each of the selected records, and selects those that have Delays of greater than 120 seconds. Intersections that have Delays LESS THAN 120 seconds are removed the selected set.

Creating Conditions

Now, you will try creating a few conditions of your own.

1. Choose TransCAD Conditions to display the Conditions window.

2. Make sure that Signal Intersection is the current layer.

3. With the cursor under Condition Name below the last condition, type NB ADT >5,000 ADT (for intersection North Bound directions >5,000 Average Daily Traffic) and press <Enter>.

A pop-up menu of data fields is displayed.

5. Choose NB ADT.

A pop-up menu of operators appears.

6. Choose "Greater Than" from the pop-up menu.

7. Enter a value of 5,000 and press <Enter>.

The cursor automatically moves down to the next line, so that you can enter another condition.

You may now use your newly created condition to find those Intersections with >5,000 ADT in the North Bound Direction.

The Data Editor Window

Moving Around the Worksheet

As you have already learned, the Data Editor window displays data in a worksheet format. Each row represents one signalized intersection in the current layer, and each column represents one data field. The current cell is indicated by the reverse video highlight.

You can move the highlight in many ways.

First, choose the Data Editor from the TransCAD menu if you are not presently there.

1. Click <left> with the mouse to move the highlight to a particular cell.

2. Use the left, right, up, and down keys to move the highlight one cell at a time. If you move off the edge of the screen, new records or data fields scroll into view.

3. Press <PgUp> or <PgDn> to display the previous or next page of data.

4. Press <Tab> or <Shift-Tab> to shift the display to the right or left by a page.

5. Press <Home> once to move the highlight to the first data field in a row. Press <Home> again to move the highlight to the first row on the page. Press <Home> a third time to move the highlight to the first record in the worksheet.

6. Press <End> once to move the highlight to the last data field in a row. Press <End> again to move the highlight to the last row on the page. Press <End> a third time to move the highlight to the last record in the worksheet.

Practice moving around the worksheet using the mouse.

You can use commands in the Data Editor window to choose which data fields are displayed and the order in which the records appear.

    1. Choose Layer Active Fields.

A pop-up menu lists all data fields in the Signalized Intersection layer. Fields that are active are toggled on and have a filled-in block.

    2. Move the highlight to ID and press <Alt>-N. (<Alt>-N turns off all of the options except the one that is currently highlighted.)

    3. Toggle on a few additional fields. Click <right> to toggle options in a multiple choice menu.

    4. Click <left> to complete the command.

The data editor displays only the fields you chose from the menu.

Try experimenting.

    1. Choose Layer Active Fields.

    2. Press <Alt>-A to activate all fields.

    3. Click <left> to complete the command.

Each layer can have one or more key (or indexed) fields that automatically maintain the records in sorted order. If you look at the top of the worksheet, you will see that the name of the key field currently in use, ID, is highlighted.

Now, change the field:

    1. Choose Layer Change Key Field.

A pop-up menu lists the key fields for the signalized intersection layer.

    2. Choose Inter. Delay as the new key field.

The worksheet display is changed to show all signalized intersections in order of increasing V/C ratios. Page over to the right (using the TAB key) to confirm that the records are in the correct order.

Editing Selecting Records

You have seen before that you can use the data editor to display data only on selected records. To experiment with this a little more:

1. Return to the map display (TransCAD Map Display).

2. Choose Select Several by Pointing, and choose four or five signalized intersections.

3. Return to the data editor.

Only the selected intersections are displayed.

Once again, note the angle brackets at the edge of the screen. Selected records area always marked by angle brackets in the data editor.

You can toggle back and forth between the selected records and all the records by using commands on the Layer menu.

1. Choose Layer Data.

The submenu indicates that selected records are being displayed.

2. Change this setting to All Records. Remember to use the toggle button.

3. Click <left> to complete the command.

When you choose the All Records option, both selected and non-selected signalized intersections are displayed. Note that the angle brackets appear only on selected signalized intersections.

Selecting Records in the Data Editor

A special feature of the data editor lets you select or deselect individual records from the keyboard. You use the gray < + > key on the numeric keypad to select the current record, and the gray < - > key to deselect the current record.

Printing Data to a Printer or to a File on Disk

After you make a spatial or conditional query, you might need a printed report that displays the results. Try the TransCAD print command to print a report.

1. Toggle off all fields except ID, North-South Street, East-West Street, and Inter. V/C. (Under the Layer Active Fields command).

2.   Choose TransCAD Print Printer to print the selected signalized intersections and their attributes.

TransCAD automatically formats and paginates the report.

Searching for a Record in a Database

First, use Key Field to find a specific intersection.

1. Make Signal Intersections the current layer.

2. Check that all records are displayed (Layer Data All Records).

3. Make North-South Street the key field (Layer Change Key Field).

4. Choose Record Find.

A prompt in the Message bar at the bottom of the screen asks for a North-South Street name.

5. Type **Hargrove** (using upper and lower case letters as shown) and press <Enter>.

The highlight moves to Hargrove Street.

You could also enter a partial name:

1. Choose Record Find.

2. Type **P** at the prompt.

The data editor highlights the first intersection whose name starts with the letter P.

You can also use this command to find records with numeric values greater than or less than a certain value.

1. Change the key field to Inter. V/C.

2. Change the order to ascending.

3. Choose Record Find.

4. Type 1.0 at prompt.

The highlight moves to the first intersection that has a V/C Ratio of 1.0 or more.

Importing Data from Other Programs

TransCAD makes it easy to import data stored in comma-delimited text files or Lotus 1-2-3 worksheet files into a TransCAD database.

   1. Make Street the current layer.

   2. Choose Layer Active Fields and activate the following fields: ID, Name, Rutting.

   3. Choose Record Import.

A submenu lists two options: Text File and Worksheet.

   4. Choose Text File.

A menu lists all files with the extension.txt.

   5. Choose file name RUTT.TXT.

If you do not see it listed in the pop-up menu, change the path to your TransCAD program directory.

TransCAD opens the file, verifies that it contains data in the proper format, and displays a large dialogue box:

This dialogue box may look complicated, but it is very easy to use. Follow these four steps:

   1. Choose a data field from the text file whose values match a data field in the current layer. Usually you match data from a text file to the database using an ID number or a name for each record. The only restriction is that the data field in the current layer <u>must be a key field</u>.

Click on the question mark buttons and choose the fields from the pop-up menus. Choose the field named ID from the text file and match it with the field named ID in the current layer.

   2. Choose the fields to import from the text file. Click on this button to display a pop-up menu of all the fields in the text file. You can choose up to ten fields at a time to import. This text file has only one field, Rutting.

   3. Choose a data field in the current layer to hold each of the fields you are importing. In this case, import the Rutting data into the Rutting field in your current street layer. Click on each button and choose the destination field from the pop-up menu.

4. Finally, click Go to import the data.

TransCAD reads each row of the text file and looks in the database for a matching ID. When a match is found, data in that row of the text file are imported into the current layer. If no match is found, the row is not imported.

When the import is complete, a message displays the number of rows imported and the number of rows from the text file for which no match was found.

Tallying Data Across Layers

TransCAD is capable of performing very powerful spatial operations. One is the ability to take data from one geographic layer and summarize it as an attribute in another layer. In this case, you will count the number of intersections located within Traffic Analysis Zone.

   1. Switch to the Data Editor window.

   2. Activate and make current the TAZ Attribute layer.

   3. Move the cursor to the Auxiliary1 field, and choose Edit Column Aggregate.

You can aggregate data from any other layer. The layers are displayed in a pop-up menu.

   4. Choose Signal Intersections.

You can count the number of intersections in each TAZ, or compute the sum, weighted sum, average, minimum, or maximum value of a Signal Intersection field.

   5. For now, choose Count.

One by one, TransCAD counts the number of signalized intersections within each TAZ, and places the number in the Auxiliary1 field.

Now, try the aggregation function again. This time, calculate the average Office Space of the Developments located within each TAZ.

   1. Move the cursor to the Auxiliary2 column, and choose Edit Column Aggregate.

The names of the other layers are displayed in a pop-up menu.

   2. Choose 1995 Developments.

The operations you can choose appear in a pop-up menu.

3. Choose sum.

A pop-up menu lists all of the numeric fields in the 1995 Developments layer.

4. Choose 1995 SF Office Space.

TransCAD finds all proposed Office Space in each TAZ, computes the total S.F. (square feet) within those TAZ's, and places the result in the Auxiliary2 field in the TAZ layer.

Charts

In this lesson, you will learn how to create pie charts and bar charts based on attribute data. You will also learn how to display pie charts directly on the map display.

Creating Pie and Bar Charts

You will start this lesson by making a pie chart and a bar chart. First, make sure the Signal Intersections layer is current. Now, take a look at the Charts window.

1. Choose Charts from the TransCAD menu.

TransCAD switches to the Charts window. The Charts window has a different set of menus than the map display and data editor. The Charts window also has a status window in the center of the screen. The status window describes the chart that will be produced when you choose the Go command.

Fill in the status window as follows:

1. Choose Chart, Type, and verify that the option pointer is set to Pie Chart. If not, click <right> to change the option.

2. Choose the Settings Data Field command.

A pop-up menu lists the data fields in the signalized intersection layer.

3. Choose Inter. LOS from the menu.

4. Click Go in the menu bar.

TransCAD displays the pie chart on the screen.

Now change the pie chart to a bar chart:

24

1. Choose Chart Type, and toggle the option pointer to Bar Chart.

2. Click Go in the menu bar.

A bar chart of the same data is displayed on the screen.

Pie Charts on the Map Display

TransCAD can also display pie charts directly on the map display. Let's create a pie chart.

1. Switch to the Map Display and activate ONLY the TAZ Attribute layer.

2. Zoom in until only the top half of the 15 TAZ's are displayed.

3. Choose Display Objects Show Pie Chart.

A pop-up menu lists all of the numeric data fields in the TAZ Attribute layer.

4. Choose 3 data fields: Office Employment, Retail Employment, and Other Employment. Remember, click <right> to toggle on the three fields, click <left> when you are ready to proceed.

A dialogue box is displayed.

5. Enter a maximum value of 10,000, a maximum size of 8 percent of the screen and a minimum value of 1000.

6. Click Go to display the pie charts.

A pie chart is drawn at the center of each TAZ. This size of the pie is proportional to the total employment of the TAZ, while the pieces of each pie are proportional to the employment of each category.

You may wish to MOVE or RESHAPE the Legend in order to see TAZ's better. (Using the Display Legend Move or Reshape command)

The maximum size pie is 8 percent of the width of the computer screen.

You can combine the pie charts with other thematic elements such as labels. Experiment with some other combinations such as Apartment, Condominium, and Retail Units in each TAZ.

IV. Transportation Planning

The Transportation Planning Module is designed to complement TRANPLAN, Cobb County's Transportation Travel Forecasting software. The GIS can be used to make updates to the TRANPLAN network, and can quickly model changes in socio-economic data for the entire Cobb County TAZ system. These modifications can then be directly converted to production and attraction information that can be input into TRANPLAN. Thus, alternatives can be quickly modeled.

Starting the Transportation Planning Module

Enter TransCAD by typing:

> C:\TRANSCAD > tc cobbtp

Alternatively, if you are already in TransCAD, you can the application by activating the **TransCAD** pulldown menu and select **Application**, and **Change**. Choose the cobbtp.app and click **Go**. This will bring up the entire Cobb County travel forecasting network.

Modifying the Network

The GIS can be used to modify the TRANPLAN network.

1. Activate the nodes and centroids layer and the link layer and make the link layer current. Deactivate the TAZ layers (TAZ1990 and TAZ2010) and refresh the screen.

2. Activate the **Query** pulldown menu and select **Edit**. Choose a link to modify.

This will bring up the **Form View Edit** screen. Before making your changes note the from and to nodes to be able to verify your changes later.

3. Make a modification to one of the fields TRANPLAN data fields, and note what your changes were. For example, change the **Volume** field from 0 to some positive number.

4. **Quit** out of the **Form View Edit** menu.

Before we create the TRANPLAN network file, the nodes and links must be selected. To do this, use the **Select All** command to select the links. Next, make the nodes and centroid layers current. Repeat the **Select All** command.

Finally, we want to run the procedure.

5.   Activate the **Procedure** pull down menu. Select the **Choose** command. Next, select the **Cobb County Transportation Planning** procedures.

6.   Select the **Update TRANPLAN Network** procedure followed by **Generate TRANPLAN Highway Network**.

As the procedure works the information about the nodes and links are written to a file that is processed by an external program. The resulting file *tranplan.dat* is in a format that can be read by TRANPLAN. Next, verify that the changes have been made.

7.   Shell out of TransCAD by pressing <F2>. AT the DOS prompt use a text editor, such as the DOS Edit program, to view the *tranplan.dat* file. Search the file for the *from* and *to* nodes noted earlier. Check to make sure your changes were made. This file can now be processed by TRANPLAN. Note: The header information for the input file was taken from the file **header.tp**. You will want to edit this information for your own use.

Creating a Functional Class Thematic Map

Thematic maps can also be made using the Links layer. In this layer, we will create a map that classifies the links by functional class base on the information contained in the "Link Group 1" field.

1.   Deactivate the nodes and centroids, and the TAZ layers and make the links layer current. Refresh the display. Activate the **Layer** pulldown menu and select **Themes** and **Create**.

2.   Choose the **Link Group 1** data field and select the by **Category** theme class. Choose the **standard** color palette with **None** style set.

3.   Select **Go** and refresh the screen. This produces a color coded map of link functional classes.

You may want to move or resize the legend (under the **Display** and **Legend...** menus)

Other Operations

Experiment using various TransCAD operations on the node and link layers. Some particularly useful ones are using the line width feature or performing conditional queries.

Creating TRANPLAN Production and Attraction files from TAZ Data

This section demonstrates how you can create TRANPLAN compatible Production and

Attraction information from socio-economic data stored in the GIS. The socio-economic data are associated with TAZ polygons that are stored on the layers **TAZ1990** (1990 data) and **TAZ2010** (2010 data). The process for creating the P & A files is as follows:

1. Make the **TAZ1990 or TAZ2010** layer current. Refresh the display. Choose **Query, One or More** and click on any one TAZ to view socio-economic data associated with that TAZ. You can also edit the socio-economic information if you want to make a P & A file that reflects these changes.

2. Create a selection set of all TAZs by activating the **Select** pull-down menu and then the **All** command.

3. Activate the **Procedure** pull down menu, choose **Cobb County Transportation Planning**, and **Create ARC P's & A's File**. The procedure will create production and attraction information in TRANPLAN format. Continue clicking till you encounter "End of Procedure" message. The TRANPLAN compatible file created is called *panda.in*. There are also several other files that are produced (see Appendix A for a complete description).

4. Shell out of TransCAD by pressing < F2 > to view the output files. Type exit at DOS prompt to return back to Cobbtp.app application.

Labeling the TAZs

1. Activate a **TAZ** layer and make that layer current. Refresh the screen.

2. Now label the TAZs by toggling the **Labels** box under the **Layer** pull-down menu. Press the **@** key to bring up a list of the fields included in the TAZ database. Select the **TAZ NUMBER** field and press enter. Order based on TAZ number/ascending. This last parameter is only used if the label can't fit on the display without overlapping another label. Refresh the screen.

Creating Thematic Maps using the TAZ Databases

Experiment creating thematic maps based on the socioeconomic data included in a TAZ database. The steps for creating a population thematic map are:

1. Turn labels off by toggling the **Labels** selection under the **Layer** pull-down menu. Refresh the display.

2. Select **Themes** from the **Layer** pull down menu and select **Create**. Create a thematic map of population. Use the **Fixed Interval** class and choose **Standard** color palette and **None** style set. Select **Interval** and set the Minimum Value to

0 and Maximum Value to 50000 and Interval of 5000. Select **Go**. Refresh the screen.

This produces a thematic map indicating the populations of the various zones. You may wish to deactivate the link layer if you haven't already done so.

Let's create a more beneficial thematic map by setting a user defined interval.

1. Select **Themes** from the **Layer** pull down menu and select **Create**. Create a thematic map of population. This time, use the **User Defined Interval** class and choose **Standard** color palette and **None** style set. Select **Interval** and set the class definitions as follows:

    #1. From 0 to < 500
    #2. From 500 to < 1000
    #3. From 1000 to < 2000
    #4. From 2000 to < 3000
    #5. From 3000 to < 4000
    #6. From 4000 to < 5000
    #7. From 5000 to < 10000
    #8. From 10000 to < 25000
    #9. From 25000 to < 50000
    #10. From 50000 to < 100000
    #11. From 100000 to < 500000

Select **Go**. Refresh the screen.

Another useful feature of TransCAD is the ability to be able to place pie charts right on the map display. Let's create such a map.

1. First select **Reset** from the **Layer** pull-down menu to clear the thematic map (refresh the display).

2. Zoom in until approximately 15 TAZ's are displayed.

3. Choose **Objects** from the **Display** pull-down menu. Select **Show Pie Chart**.

A pop-up menu lists all of the numeric data fields in the TAZ Attribute layer.

4. Choose the following 5 data fields: **Retail Emp.**, **Comm./Gov. Emp.**, **Industry Emp.**, **Construction Emp.**, and **Misc. Emp.** Remember, click <right> to toggle on the five fields, click <left> when you are ready to proceed.

A dialogue box is displayed.

5.   Enter a maximum value of 10,000, a maximum size of 8 percent of the screen and a minimum value of 1000.

6.   Click Go to display the pie charts.

A pie chart is drawn at the center of each TAZ. The size of the pie reflects the total employment of the TAZ, while the pieces of each pie are proportional to the employment of each category.

You may wish to HIDE, MOVE or RESHAPE the Legend in order to see TAZ's better. (Using the **Display Legend....** command)

The maximum size pie is 8 percent of the width of the computer screen.

You can combine the pie charts with other thematic elements such as labels. Experiment with other attributes that are suitable for pie charts such as using the many income categories that exist in the TAZ databases.

Modifying/Exporting a TAZ Database using TCBUILD

The purpose of this exercise is to create a smaller TAZ database that is a subset of an existing TAZ database (only TAZs with a population greater than 50,000). The process is as follows:

1.   First select **Objects...Clear All** from the **Display** pull-down menu to clear pie charts.

2.   Activate the TAZ1990 layer and make it current. Activate the **TransCAD** pulldown menu and select **Conditions**. Enter condition name "POP". Goto the 'Data Field' and press the spacebar to identify the data fields in the 1990 TAZ database. Select 'Population'. Goto the 'Operator' field and press the spacebar and select the 'Greater than' operator. Enter 50000 in the 'Value' field. Press < Alt T > to go back to the **Map Display**.

3.   Activate the **Select** menu and select **Several...** command. Next select **on Condition** and then **One Condition**. Choose the **POP** selection.

The selected TAZs should appear highlighted on the map display. It is now time to use TCBuild. TCBuild is an external utility program supplied with the TransCAD package. You will first have to quit out of TransCAD before using TCBUILD.

4.   Within the c:\transcad Directory, type **TCBUILD** to execute TCBUILD program. Activate **Database** pulldown menu and select **Export Setup**. Within the Export Setup window type c:\transCAD\dbs90 for Location of Database, cbtz90 for

Database name and texp.bld for Build File name. Activate **Database** pulldown menu and select **Export Selected**.

This sequence will create a "build" file which is an ASCII data file that provides a schema of the cbtz90 database. Also created are a pair of comma-delimited data files. Next we will make some modifications to the database schema before we rebuild a new database.

5. Activate the **Files** pulldown menu and select **Open Build File** to open texp.bld file. Within the Database Information window, type **texp** when prompted for the Name of New Database and **c:\temp** for the database location. Activate **Database** menu and select **Build**. This will build a new 'texp' database that includes only those TAZs with population greater than 50000. Select **Quit** from **Tcbuild** menu to exit Tcbuild.

5. Edit the **cobbtp.app** file within the c:\transcad directory and add the new database texp by adding **c:\temp\texp** under **[databases]**.

6. Open the cobbtp.app application to use the new texp database.

Adding New Data Fields to an existing Database using TCBUILD

TCBUILD provides a mechanism for adding, removing, or modifying fields from an existing database. The purpose of this exercise is to add a new field into an existing database CBTZ90 within the directory c:\transcad\dbs90 and create a new database called temp in the directory c:\temp.

1. Within the TransCAD Directory, type **TCBUILD** to enter the TCBUILD program. Activate the **Database** pulldown menu and select **Export Setup**. Within the **Export Setup** window type **c:\transcad\dbs90** for the location of the database, **CBTZ90** for the database name and **temp.bld** for build file name. Activate the **Database** pulldown menu and select **Export All**.

2. Activate the **Files** pulldown menu and select **Open Build File** to open temp.bld file. Within the Database Information window, type **temp** for the database name, and **c:\temp** for the database location.

3. Activate the **Edit** pulldown menu and select **Layer** and choose CBTZ1990. Activate the **Edit** pulldown menu and select the **Field** menu. Select any one field within layer CBTZ1990. Now to add new field activate **Edit** pulldown menu and select **Add**. Within the Field Window, type a new field name to replace 'Field Name'. Decide whether the new field is supposed to be a key field (especially useful for sorts and searches based on this field) or a non-key field. Toggle between options by pressing the spacebar. Select appropriate data type within

'Data type'.

Once you have initialized above parameters for the new field, you are now ready to 'build' the database.

4. Activate the **Database** menu and select **Build**. This will create the 'temp' database. Select **Quit** from **Tcbuild** menu to exit Tcbuild.

5. Edit the **cobbtp.app** file within the c:\transcad directory and add the new database 'temp' by adding **c:\temp\temp** under **[databases]**.

6. Open the cobbtp.app application to use the new temp database. Go into the data editor and tab over to see your new field.

Appendix A

Files/Programs/Database necessary to run
COBB COUNTY TRANSPORTATION PLANNING procedure

Files

1. [path]\transcad**cobbtp.app**
    The application file for using the transportation planning module.

2. [path]\transcad**procs.mnu** (do not copy onto existing procs.mnu, but make addition to add new procedure menu options.)

3. [path]\transcad\procs**trpgen.cmd**
    Command file for "Create ARC P's and A's" procedure.

4. [path]\transcad\procs**createtp.cmd**
    Command file for "Create TRANPLAN network" procedure.

5. [path]\transcad\procs**clean.exe**
    An executable file that rearranges and cleans data within the household datafile **archh.dat** and the socio-economic data in **arczn.dat** files to make it compatible with input files for trpgen.exe.

6. [path]\transcad\procs**trpgen.exe**
    An executable file that generates P's and A's based on old ARC balancing factors. It requires **archh.dat** and **arczn.dat** files created by "Dump Attribute" command in the **trpgen.cmd** file. The files it creates includes **cobbpr.dat**, **cobbat.dat** and **arcrepor.out** files which are the production data file, the attraction data file, and the report file respectively.

7. [path]\transcad\procs**newrep.exe**
    An executable file that rebalances P's and A's based on new ARC Balancing factors and generates a new **newrep.out** report file. Also, a TRANPLAN compatible P's and A's file, **panda.in**, is created.

8. [path]\transcad\procs**gis2tp.exe**
    An executable file that creates a tranplan compatible network file (tranplan.dat) using the network database.

Databases

1. [path]\transcad\dbs90**cbtz90.***
2. [path]\transcad\dbs21**cbtz20.***
3. [path]\transcad\dbs90net**cobbnet.***