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Emergency response analysis model : ERAM

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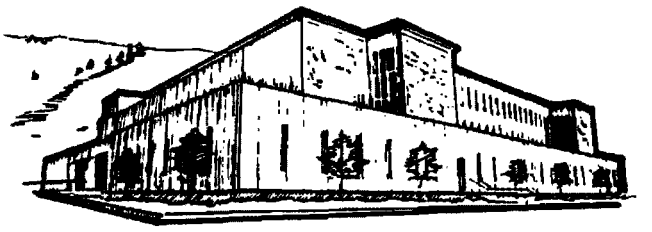

EMERGENCY RESPONSE ANALYSIS MODEL

ERAM

By

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1.0 INTRODUCTION

This paper and software package was prepared for fire districts looking for a quantitative tool to evaluate alternative fire equipment deployment scenarios. The paper is not intended as a formal operations manual but rather as a working guide for one approach to data collection, input, and manipulation on a proposed quantitative evaluation method. The method discussed is a PC based software package entitled ERAM (Emergency Response Analysis Model). ERAM was developed expressly for academic purposes in conjunction with this paper and should not be placed in actual practice until the program is Beta (site) tested.

The ERAM Program will operate on any IBM XT/AT or compatible with at least one 1.2M floppy disk drive. The preferred method of implementation, however, is installation on a hard disk drive. The two reasons for this are increased data storage capability and program operating speed. Program execution is menu driven in order to facilitate its use. Menus guide the user from installation to initial data base setup and from command input to report output.

The basis for ERAM is the New York Rand Institute's (RAND) Firehouse Site Evaluation Model. ERAM is predicated on the same key assumptions and travel time estimate formulae as were developed by RAND. Utilizing these key

assumptions and calculations provides integrity to ERAM's primary functions and methodology. ERAM also includes all of the reporting capabilities found in the original RAND Program, but, it is at this point where the commonality ceases. Programming logic, distance estimating techniques and command operation have all been altered or enhanced. Unlike the RAND program, ERAM is PC compatible and menu driven. In addition, ERAM is capable of custom data base reporting and response barrier recognition. Response barrier recognition allows barriers to vehicular traffic, such as waterways, to be taken into account when calculations relating to response time are made. Instead of using simple straight line distances between the station and the incident to calculate response time, the distance to traffic access points, such as bridges, are taken into account. With this enhanced response distance technique, ERAM can better model response time patterns for the fire district.

It should be noted that the response time patterns which are used to evaluate alternative equipment deployments are always used as relative comparison tools and not absolute measures of response times to specific locations in the fire district. The model is intended to be applied reiteratively in order to compare alternative station deployment scenarios. The scenario producing the

best overall district response pattern, as interpreted by the reviewing group, implies optimal district fire protection. Therefore a three minute estimated response time is interpreted as providing better fire protection than a six minute estimate, however it does not mean that a response to this location will take three minutes in actual travel time. It only means that the response should be better than that from the six minute location given equal response conditions such as traffic and road conditions.

In addition, it should be noted that ERAM is not a blackbox answer to fire department facility siting. Numerous other factors such as site availability, political concern, traffic patterns, and cost factors all play a integral part in the siting process. It is the specific intent of ERAM to be only a quantitative tool and not an instant solution. ERAM should be treated as a part of the larger study effort, the importance of which is determined relative to other key siting factors by the local siting team.

2.0 ASSUMPTIONS

Except for the new travel estimating technique discussed in the previous section, the assumptions used in ERAM are the same as the original Firehouse Site Evaluation Model work done by RAND. The intent of ERAM was to build on the RAND work and thereby not have to defend all the underlying assumptions of the model. If the siting team cannot adopt all of the model assumptions due to local conditions such as high workload invalidating the 100% apparatus availability assumption, they should decline use of this model.

2.1 ASSUMPTION #1

The model assumes that there will be 100% availability of apparatus to respond to an alarm.

> "In most cities, fire companies spend less than five percent of their time fighting fires. At most other times they are performing a different function: providing insurance against fire loss. That is, they are available in case a fire occurs and are situated so that they can respond quickly to alarms".[1]

The model assumes that when an alarm comes in, the engine assigned to first respond to that location, the first due response apparatus, is available to be dispatched

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[1] Dormont, P., Hausner, J., Walker, W., "Firehouse Site Evaluation Model: Description and User's Manual, "The New York Rand Institute, R-1618/2-HUD, June 1975, p. 5.

to the incident. This is important as it becomes the basis for response time patterns produced by the model.

2.2 ASSUMPTION #2

It is further assumed that personnel from the closest station will respond to an incident. This information is used to determine incident/station response lists which are used to identify first and second due response companies for the incident location.

2.3 ASSUMPTION #3

For reporting purposes, ERAM assumes that model output is to be grouped by apparatus type. In order to present response and company data for both engine and ladder companies in the district, the user must prepare separate report requests for each type of apparatus.

2.4 ASSUMPTION #4

The fourth assumption of ERAM is key to its functionality and enhancement over the RAND Institute's Firehouse Site Evaluation Model. Whereas, RAND assumed that right angle and direct line distance measurement were sufficient to adequately model a district response pattern, ERAM has added an additional distance estimate technique to account for restrictions/barriers to response travel. A list of the three techniques follows with an example of

application for each. The symbols to all the formulae are defined in the legend.

Legend

d = distance from station to geo-grid location in miles
X_s = X coordinate of station
Y_s = Y coordinate of station
X_i = X coordinate of incident
Y_i = Y coordinate of incident
AP1 = Access point and ID number

1) Right Angle Distance Technique

$$d = |X_s - X_i| + |Y_s - Y_i|$$

This formula is used for grid street patterns.

2) Straight Line Distance Technique

$$d = ((X_s - X_i)^2 + (Y_s - Y_i)^2)^{0.5}$$

This formula is used for irregular street patterns

3) Access Point Distance Technique

$$d = \left[\begin{array}{l}\text{actual or time factored distance from station to last required access point in the traverse to the access region (section 4.4)}\end{array}\right] + \left[\begin{array}{l}\text{distance estimate using technique 1 or 2 for AP1 to geo-grid location}\end{array}\right]$$

This formula is used for two purposes. The first case occurs when there is limited access. An example of this would be a response route which must utilize a bridge in order to respond to part of the fire district. The second

case is when the response route consists of adverse conditions. Examples of this would include roads with excessive grades or extremely poor surfaces. Under these conditions, "Time Factored Distance" could be substituted for actual travel distance to better represent the response time to fire district areas along these routes. Time Factored Distance (TFD) is defined as the distance value derived at by inputting an actual travel time recorded between two known points in the fire district and solving the following formula :

$$TFD = \begin{cases} (T/2.1)^2 & \text{for } T < 1 \text{ minute } 18 \text{ seconds} \\ (T - .65)/1.7 & \text{for } T > 1 \text{ minute } 18 \text{ seconds} \end{cases}$$

Where TFD = Time Factored Distance
T = Travel Time in minutes.

This technique allows you to take a known travel time value and convert it to relative distance for the purposes of this distance technique.

2.5 ASSUMPTION #5

The model assumes you can reasonably estimate response time from travel distance using the following empirical formula:

$$T_d = \begin{cases} 2.1\ (d)^{0.5} & \text{for } d < .38 \text{ mile} \\ .65 + 1.7d & \text{for } d > .38 \text{ mile} \end{cases}$$

Where d = Travel Distance in miles
T_d = Travel Time for a given Distance (in minutes)

All parameters utilized in the equation have been established by RAND experiments.

> "As a result of conducting the experiment in several cities, we have found that a single function usually provides a good representation of the relationship between travel time and travel distance at all times of the day and in all areas of the city.....Our (Rand) experience in a wide range of cities has shown that the values of these parameters exhibit little variation from city to city."[2]

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[2] Dormont, P., Hausner, J., Walker, W., "Firehouse Site Evaluation Model: Description and User's Manual, "The New York Rand Institute, R-1618/2-HUD, June 1975, p. 13.

3.0 HOW ERAM DEFINES THE FIRE DISTRICT

The fire district is represented in ERAM by the sum of its parts. The following sections will explain how geographic areas and fire history data are gathered and prepared for input to the ERAM System. The combined data sets define the fire district as it is to be represented for the ERAM program. No overview of the entire district is required. All input is done at the detail level referred to as geo-grids. Geo-grids are defined and described in section 3.2 .

3.1 BASE MAP

Selection of a proper base map is crucial to the implementation of ERAM. The base map is used to convert all geographic information concerning the fire district into coordinates for use in the ERAM program. The primary consideration is that the base map must be of sufficient size and detail to allow easy identification of specific locations and to permit measurements to within a tenth of a mile. Typically a wall map of the district is the best choice, however, any map on which a tenth of a mile increment can be clearly discerned is sufficient to accomplish this goal.

3.2 GEO-GRID SYSTEM

In order to plot the fire district data on the Base Map and record relative positions for use by the computer model, a geo-grid system must be superimposed on the map. For map readability, only a grid representing square miles is placed on the base map. A fine grid, where each cell represents one tenth mile square, is prepared separately on a piece of clear plastic and overlaid on the base map using the one square mile grid as a reference (see Appendix A for sample of plastic overlay).

The course grid (one square mile) is always started past the western most point of the fire district, including any anticipated expansion within the foreseeable future. In addition, this starting point should also be below the southern most point of the district. This point will be the grid origin and be labeled (0.0, 0.0) (see Figure 1).

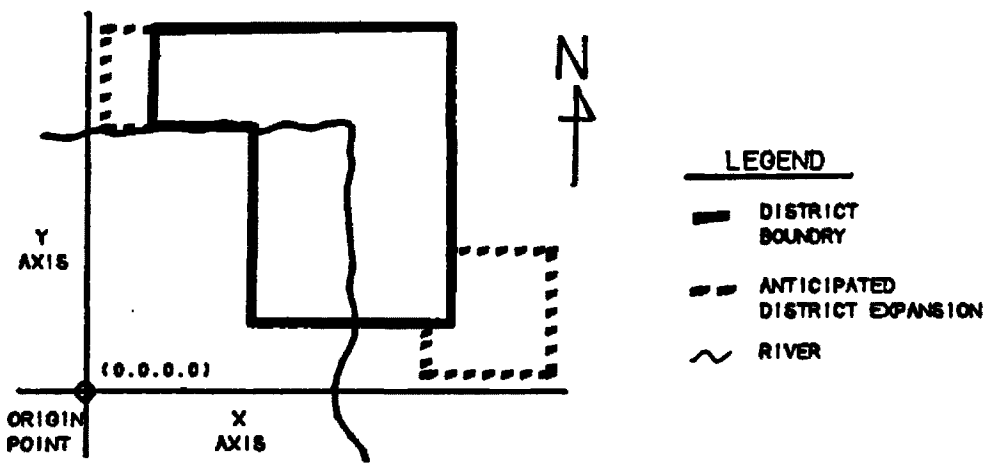


Figure 1 - Grid Origin

A horizontal line is then drawn from the origin to a point beyond the eastern most boundary of the district or area of anticipated expansion. A vertical line is likewise drawn from the origin to a point beyond the northern most boundary. Both lines are then marked at one mile intervals from the origin and a grid is drawn (see Figure 2).

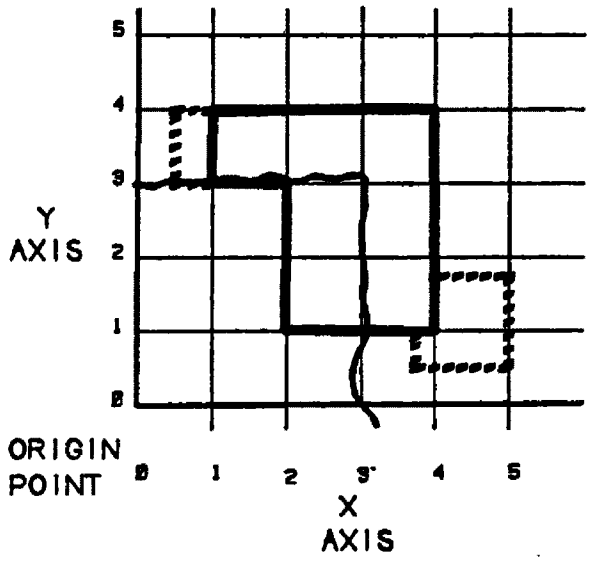


Figure 2 - Course Grid

The course grid (one square mile) is the basis for all fire district geo-grid locations used by the ERAM model. The fine grid (one tenth mile) is used to further define a location to the program. The fine grid is prepared by placing a clear plastic sheet over the course grid. The corners of one of the square mile areas are transferred to the plastic overlay, then the corner points are connected to form a square. Next, the sides of the

fine grid square are marked at one tenth mile intervals to form the fine grid. By placing the fine grid over the course grid marked on the base map, locations can be defined to either plus or minus one tenth mile (see Figure 3). The locations are noted using the following convention:

$$(X_c.X_f,\ Y_c.Y_f)$$

Where X_c and Y_c are the X and Y coordinates respectively from the course grid and X_f and Y_f are the fine grid blocks in which the incident falls. (Note: locations falling on a course or fine grid line are always assumed to be in the higher (X,Y) coordinate which the line separates).

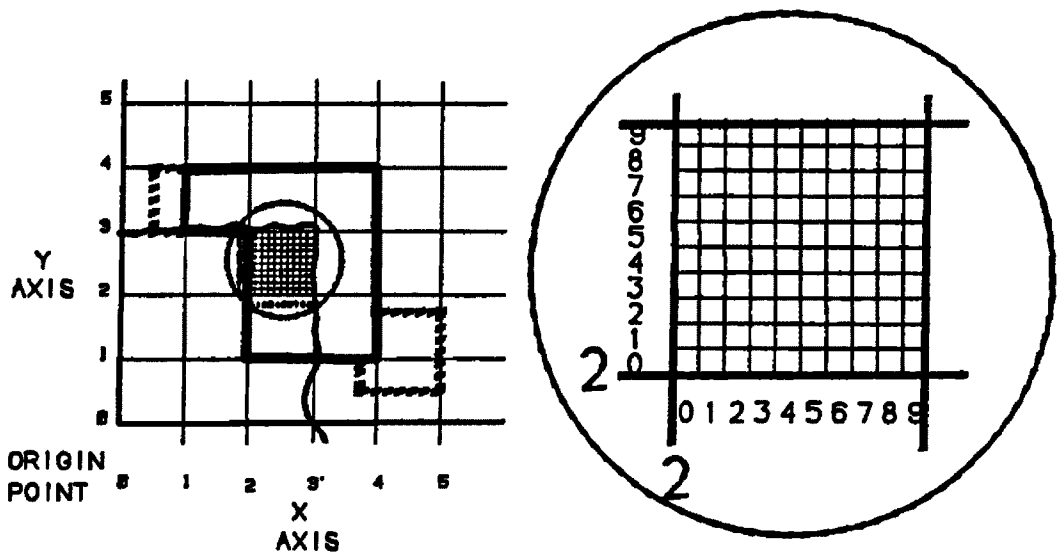


Figure 3 - Course Grid and Fine Grid

4.0 INPUT DATA

There are several types of data which must be collected for the model:

1) Demand Region Data
2) Incident Data
3) Station Locations
4) Access Regions Data
5) Location of Target Hazards

This section will be primarily devoted to defining the types of data required and suggesting ways that they might be collected and coded for convenient input into the computer.

4.1 DEMAND REGION DATA

A Demand Region is a defined area of uniform fire protection demand. There are eight basic types of demand regions based on land uses which are typically used to describe the make-up of fire districts. These include residential, central business district, commercial, industrial, rural, wild land, parkland and mixed land use regions. Further descriptions may be used if appropriate such as high, medium and low population density for residential use. The Demand Region types may be used in any combination to define fire districts. Each region must be assigned a consecutive identifier number (ID) starting with the number one. The total number of regions cannot

exceed ten per fire district.

The demand regions are primarily used in the report module to compare fire protection levels among the district's demand regions. The comparison is made in terms of each region's number of alarms and its average/maximum travel times. Typically, like demand regions should have a similar degree of fire protection. For example, one would expect a high density residential region in one part of town to have similar response times to a high density residential area in another part of town. Conversely, a rural residential area would usually receive a lower degree of protection than the town's central business district. Demand Regions are identified on the planning map and borders are drawn around each. The process of identifying and classifying fire protection demand regions continues until the entire district has been categorized. This process is depicted in Figure 4. Note: the total number of identified Demand Regions must not exceed ten.

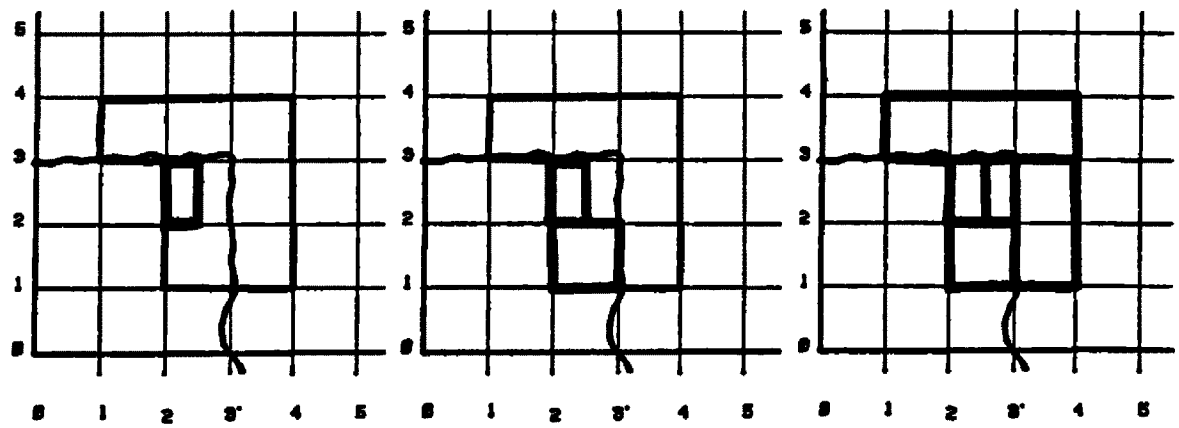


Figure 4 - Demand Regions

Once the demand region outlines have been marked on the base map, then the (X,Y) coordinates are recorded (see Figure 5). This process is accomplished by starting on the southern most tier of grid cells which overlaps the fire district. Moving from west to east along this tier of cells, the user will note the first cell which overlaps the first district. The X and Y coordinate for this point is noted on an appropriate form using the geo-grid system explained in Section 3.2 . Also noted is the ID number selected for the demand region. The user continues in this method noting all demand region boundaries encountered until the easterly most fire district boundary is reached. At this point the user begins the process over again in one tenth mile intervals up the base map. The process continues until the entire fire district has been covered.

X Coordinate	Y Coordinate	Demand Region or Next Row
02.1	01.3	6
05.6	01.3	N
02.0	01.4	6
05.7	01.4	N
.	.	.
.	.	.
.	.	.
01.7	03.4	4
02.5	03.4	5
04.7	03.4	7
05.9	03.4	N

Figure 5 - Tabulation of Demand Region Coordinates

In areas where the fire district is not continuous along a tier, cells which are not part of the district should be assigned to demand region zero. The ERAM program will automatically delete all geo-grids identified with demand region zero. Note: the process used to define demand regions is the same process used to define access regions (see section 4.4).

An input form similar to I4.1 (see Appendix A) should be used to record X, Y boundary points for the demand region and its identification number. This input form will then be used to transfer data to the computer using the menu driven input system.

4.2 INCIDENT DATA

Fire history, for a period of at least one year and typically not to exceed three years, is gathered from district records or requested from state fire agency records kept as part of their Fire Incident Reporting System. The data required consists of the following:

a) Incident identifier (an ID number....)

b) Location of incident (refer to Section 3.2)

c) Incident Type (structural or other)

This information should be prepared and placed on an input form similar to Form I4.2 which appears in Appendix A. The program's menu system provides a simple method to transfer the data from the prepared form to the computer. Data are

input on an incident by incident basis.

4.3 STATION LOCATIONS

Station locations are primarily (X,Y) coordinate sets. Each station location is assigned an ID number, as structured in Figure 6, and recorded on an input form similar to I4.3 in Appendix A.

EXAMPLE: Station Id - E045100

Type of Company	X Coordinate	Y Coordinate
E	045	100

LEGEND:

Engine
Ladder
Both

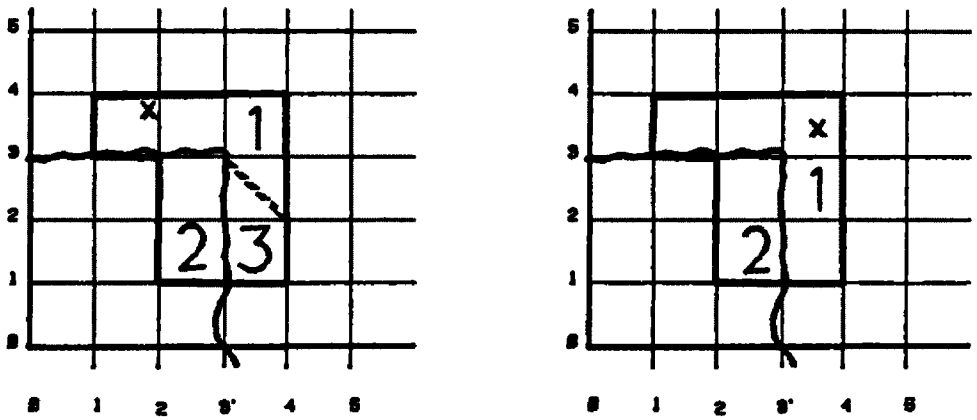
first two digits in coordinates are course (mile) grid values; third digit is the fine (one tenth mile) grid value

Figure 6 - Station ID Nomenclature

4.4 ACCESS REGION

An access region is defined in ERAM as an area within the fire district in which no obstacles to travel exist. Common boundaries for Access Regions include, but are not limited to, bodies of water, undeveloped lands, and major limited access highway systems traversing a fire district. The purpose of access regions is to prevent the model from under estimating travel distances for response routes which must navigate around such barriers. Unlike

Demand Regions, which are established once for the fire district, Access Regions are station location specific (refer to Figure 7). If a station is moved or a new station is added to the fire district, ERAM requires new access data based on the new location. When multiple stations are presented in a station deployment scenario, the access regions for each station will usually be different.



LOCATION 1 SHOWS 3 ACCESS REGIONS ARE NECESSARY TO PROVIDE UNRESTRICTED ACCESS TO THE ENTIRE FIRE DISTRICT WHILE THE STATION IN LOCATION 2 REQUIRES ONLY 2 REGIONS FOR ACCESS

Figure 7 - Access Regions

Since there are an infinite number of possible access region configurations within a fire district, access regions should be mapped out on a large sheet of plastic overlay, like the material used for the fine grid sample. DO NOT mark access regions directly on the base map. Once the overlay has been used to fill out an access region

input sheet such as I4.4a found in Appendix A, it may be wiped clean or stored for record. The total number of access regions for a station location should be kept to the minimum necessary to avoid gross disregard for physical barriers during response distance calculations by the model. In mapping access regions, minor barrier infringements are acceptable.

There are three techniques which can be applied to save time in the access region mapping process. While redefining all access parameters for each new station location is still highly recommended, the following techniques can be applied under specific conditions.

First, if an alternate station location is within the same immediate access region as a previously defined station, the original station's setup parameters may be utilized. However, the distance to required access points in the access matrix should be revised for the new location. This will significantly reduce the study time required to define a station's access regions.

Second, if access is abundant throughout the fire district, the entire district may be considered a single response region regardless of barriers.

Third, preliminary studies may consider a single access region approach as a viable time saving measure prior to a full study. Although the access region must

still be input for even a single access region technique, the existing district borders can be entered in place of developing more elaborate access region boundaries. This single access region mode of operation provides results similar to the RAND Model on which ERAM is based.

As mentioned earlier, every time a station is moved or a new station is added to the fire district, ERAM requires new access data based on the new location. These data consist of three components: 1) access points, 2) access region boundaries, and 3) a travel access matrix. These items are discussed in the sections which follow.

4.4.1 Access Point

Access points are the geo-grid locations where primary response routes cross from one access region to another. They are typically bridges, or sole access roads, but they can also simply be main streets or predetermined emergency response routes. Figure 8 depicts a station location which requires two access points to obtain unrestricted access to the fire district. Using the station's existing position and the two access points, it is now possible to draw direct response routes to all areas of the district. Access point (X,Y) coordinates are incorporated on a station's access matrix input form which is referenced in section (4.4.3).

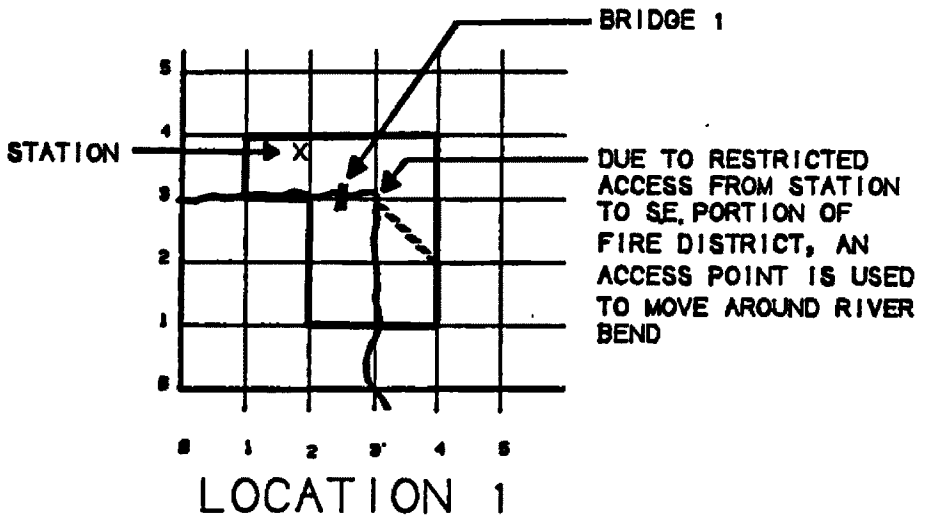
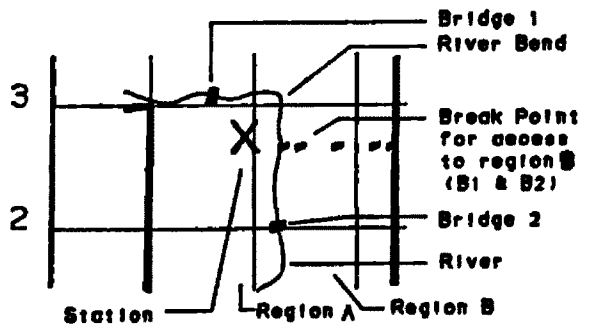


Figure 8 - Access Points

4.4.2 Access Region Boundaries

Access Region Boundaries are usually physical obstacles, such as waterways and non-traversable expanses of land. Physical boundaries should be considered first when defining access regions. The process for recording region boundaries on an input form similar to I4.4a, in Appendix A, is the same as that used for Demand Regions (section 4.1). Pseudo-access regions boundaries require additional explanation. A pseudo-access region is created when a contiguous access region contains a partial obstruction to direct access within the region or when an access region has multiple access points. In the case of a partial obstruction of a continuous access region, a line is drawn tangent to the obstacle, from the station or access point for the region to the opposite border of the

access region (refer to Figure 7). The area of the region which can not be reached directly from the station or access point is assigned a separate access region ID. The tangent point on the obstacle is utilized as the access point for the newly identified pseudo-access region. In the case of an access region with multiple access points. Two adjacent access points are selected for study at a time. Then the shortest route between the station, first access point to be studied, second access point, and back to the station is determined. This shortest route distance is then divided by two to establish the break point distance along the route. The break point is then used as a reference point to subdivide the access region into two pseudo-access regions based on the shortest response route selection. Figure 9 illustrates the process used to delineate pseudo-access regions.



From	To	Distance in miles
Station	Bridge1	.87
Bridge 1	River Bend	1.18
River Bend	Bridge 2	2.17
Bridge 2	Station	1.55
Distance on traverse		5.77
		÷ 2.
Distance to break point		2.88

Figure 9 - Access Regions & Pseudo Regions

4.4.3 Access Matrix

The final component to an Access Region is the

travel access matrix. The matrix is primarily a listing of distances and access points recorded on a form similar to 4.4b in Appendix A and used when calculating response times from the station to various points in the region. The access region containing the station must always be identified as the 'A' access region. Fire districts with multiple access regions must identify each additional access region with sequentially assigned ID. Next, the actual or time factored distance is recorded for the route from the station to the access point used for the access region in question. If the response route travels through more than one access region, only the last access point which provides the immediate access to the region is utilized in the matrix (refer to Figure 10).

MATRIX: for station E025030

Access Region	Actual or Time Factored Distance from the station to the last access point in traverse to the access region	Coordinates of last access point	Distance estimate technique to use from last access point to geo-grid location*
A to A	-	-	1
A to B	0.8 miles	02.5 04.0	1
A to C	1.2 miles	03.8 02.1	2

* distance techniques from section 2.4

Figure 10 - Access Matrix Example

4.5 TARGET HAZARD

Target hazards are special locations in the district which require individual consideration with respect to fire protection. These include, but are not limited to such places as schools, hospitals and hazardous industrial sites. They are identified with their description and (X,Y) coordinates (refer to Figure 11). Targets should be recorded on an input form which is similar to I4.5 found in Appendix A.

Target Description	Location
Eastside School	095 040
Norwich Hospital	100 050
Atomic Fireworks	031 017

Figure 11 - Sample Target Hazard List

5.0 MENU SYSTEM OVERVIEW

The ERAM menu system is comprised of nested menu screens which allow the user to move in and out of the program structure. Following the opening screen, the Main Menu is presented. It is this menu which directs the user to the main functional program groups and the final exit menu. The menu screens display both menu options and comments which guide the user through the ERAM system. It is imperative that the user read any comments on the menu screens. The comments present information on proper screen entry procedures and provide warnings of prerequisites for menu selections. Failure to note and comprehend these messages can prevent the user from successfully completing the data input or data manipulation processes.

The process to evoke ERAM begins by placing the ERAM diskette in the computer's 'A:' drive and entering the command 'A:eram', at the DOS prompt. ERAM will then respond with its opening screen. The Main Menu, which follows the opening screen, contains the six primary branch menu options. These options include:

1) System Setup
2) Data Input
3) Deployment Scenario Development
4) Report Output
5) Utilities
6) Quit

Typically, applications of the model require the user to address each of the first four menu branches in the order in which they are presented on the main menu. The last two selections, "Utilities" and "Quit", may be accessed at any time during the program implementation process.

5.1 SETUP MENU

The setup menu provides two basic options. The first is hard drive installation. This is the preferred implementation practice for ERAM as it provides better program performance and user convenience than floppy drive operation. The hard drive installation option creates a directory for ERAM (\ERAM), copies the ERAM files from the floppy diskette to the \ERAM directory, and creates a batch file (ERAM.BAT) in the root directory. Once ERAM has been setup on a hard drive, the user can evoke the model from either the root or \ERAM directory by entering the command 'ERAM' from the DOS prompt. The second setup menu option allows floppy drive implementations of ERAM to redirect the data created by the model to another drive for data storage. In a floppy drive implementation of ERAM, the user accesses the model by entering 'A:ERAM'. The Quit option on this and all other branch-menus, returns the user to the previous menu. In this case, the user will return to the main menu.

5.2 INPUT MENU

The input menu contains the following five menu options:

1) Demand Region Data Input
2) Incident Data Input
3) Station Data Input
4) Target Hazard Input
5) Quit

The input menu system was designed to efficiently transfer data from hard copy input forms to ERAM's computer data files. The fire district data should have been previously collected and recorded as described in the Input Data Section, numbered 4.0 through 4.5, of this paper. The user must complete the demand region data input first before attempting to input data to the other input menu options. This is because the subsequent menu options initiate programs which append the X,Y coordinate data established in the demand region data base to their files. This data transfer is a one time process designed to maintain data base consistency and therefore must only append data from a completed demand region data base. There are numerous on screen warnings which refer to this matter. Failure to complete the demand region input prior to accessing another input option will result in program errors.

Once the demand region data base is established, the user may proceed to input incident, station, and target hazard data. Both incident and target hazard data are relatively simple inputs centering primarily on X,Y coordinate sets. Entering station data, however, is more involved.

The process of creating station data begins with the identification of the station's X,Y coordinate set. Once the station location data base has been created for the coordinate set, the station's response matrix must be edited. This process involves inputting the basic data developed and recorded for the station's access matrix as discussed in section 4.4.3 above. Finally, the station's access region data base can be updated. This final step involves input of the basic data relating to the station's access regions as developed in section 4.4. Once done, this completes the data set for a station. All data input must be complete prior to selecting the Deployment Scenario option on the main menu.

5.3 Deployment Scenario Menu

The deployment scenario menu is used to define a fire station deployment configuration. Once a name for the scenario data base is selected, the program requests the user to identify the years for which incident data is to be included in the model. Following the completion of

incident data selection, the program prompts the user for station locations to be used in the scenario. The station locations must have been entered previously using the station data input menu. Selected station locations are further classified by the user as being part of the current or the proposed configuration scenario. If a station location is involved with both the current and proposed scenarios, the location should be entered twice, once with a 'C' for the current configuration and once with a 'P' for the proposed scenario. All data input to a deployment scenario is processed during the interactive menu screen session. When the user exits the deployment scenario menu system, the scenario data base is complete and ready for reporting.

5.4 REPORT MENU

The report menu lists five standard reports which can be prepared for the selected deployment scenario. Sample reports can be found in Appendix B. By reviewing the reported statistics, for the alternate fire station deployment scenarios, the fire district planning group can draw quantitative inferences as to each deployment scenario's relative degree of fire protection for the district. Each report provides data on the first due and second due response times for both the current configuration and the proposed deployment scenario.

A listing of the standard reports follows:

1) Demand Region Statistic - this report provides information on citywide and demand region response times and fire incident counts.

2) Distribution of Response Times - this report provides information on citywide and demand region distribution of response times in preselected time intervals.

3) Company Statistics - this report provides information on response times, response area, and company workload, in terms of fire incident counts, for station locations identified in the deployment scenario.

4) Deployment Scenario Affect - this report provides information on citywide and demand region response times and fire incident counts for areas which have been affected by a deployment scenario when compared to the current configuration. In this report, affected refers to whether the response time to a geo-grid location has increased in the proposed scenario, which ERAM would categorize as degraded, or decreased to provide an improved response time. These affected geo-grid locations are then grouped for reporting by their classification as either degraded or improved. Data for the combined affected geo-grid areas are also reported.

5) Target Hazard Statistic - this report provides information on citywide and specific target location response times and fire incident counts at the target locations.

In addition to the standard ERAM reports, it is important to note that custom data base reports can be prepared by any person with knowledge of and access to a Dbase compatible software package. It is possible to create the custom reports by directly accessing the ERAM data base files and manipulating the files by themselves or in combination with other fire district data files.

5.5 UTILITY MENU

The utility menu performs several tasks to assist the user, however, none are critical for the operation of the program. The utilities are primarily a convenience.

The first two utilities provide a file protection method for hard drive applications of ERAM. The backup and restore utilities are designed to prepare a floppy disk backup copy of the ERAM files on the user's hard drive. This provides a means to restore the ERAM files should they accidentally be erased or corrupted.

The next two utilities produce informational listings for the user. The deployment scenario utility produces a summary of the stations, their classification as either current or proposed, and the deployment scenarios they are associated with. The location information utility lists the location of geo-grids that have been defined with location descriptions. In addition, this utility provides an edit mode to add or modify location descriptions on screen. This provides the user with a means to make notations about specific locations in the fire district.

The following two utilities perform simple calculations for the user. The break point work sheet permits the user to enter the distance values for each leg of a 'shortest traverse' used in working with pseudo-access regions (refer to section 4.4.2). The value returned by

the utility is the break point, or half way value, used as a reference point on a pseudo-region boundary. The other work sheet utility is used to convert travel time to its time factored distance (TFD) equivalent, as discussed in section 2.4 (distance technique '3').

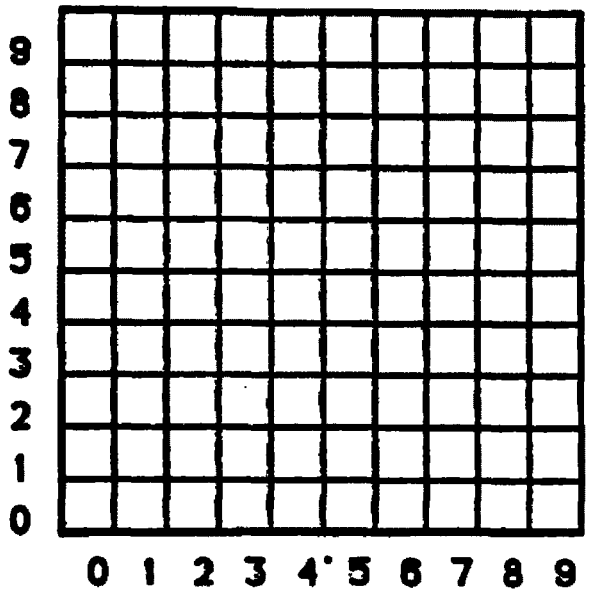
The final utility permits the user to directly access data base files. Both format styles, browse and edit, allow the user to view data in the files and make corrections. If a user recognizes that a mistake has been made, it can be corrected after the input session is finished. It should be noted, however, that extreme caution should be exercised when editing directly in the data files. It is highly recommended that a user attempting such a correction for the first time, contact the author for suggestions and guidance.

6.0 CONCLUSION

In conclusion, ERAM is a geographic based analytical tool which can be used by fire districts to evaluate alternative station deployment configurations. By modeling response times for the various deployment scenarios, ERAM adds an objective element to the siting process and thereby lends strong support to recommendations developed by the fire district's planning team. In addition to the facility siting aspects of the program, ERAM also provides a base for conducting station workload studies and a variety of geographic applications, such as fire incident mapping. Given the original intent of the program and its potential for future application development, ERAM is more of a starting point than a final product. It is hoped that this product will find its niche in the field of fire district planning and in time develop to its full potential. At this time the Rev. 0.4 version of ERAM is submitted for review and comment.

Appendix A

SAMPLE OVERLAY AND INPUT FORMS



SAMPLE OVERLAY GRID

DEMAND REGION INPUT FORM - I4.1 ERAM

X COORDINATE	Y COORDINATE	DEMAND REGION OR NEXT ROW

INCIDENT INPUT FORM - I4.2 ERAM

X COORDINATE	Y COORDINATE	INCIDENT TYPE	ID NUMBER

STATION INPUT FORM - I4.3 ERAM

STATION TYPE	X COORDINATE	Y COORDINATE

STATION TYPES E - Engine / L - Ladder

ACCESS REGION INPUT FORM - I4.4a ERAM

FOR STATION _____

X COORDINATE	Y COORDINATE	ACCESS REGION OR NEXT ROW

ACCESS REGION INPUT FORM - I4.4b ERAM

MATRIX FOR STATION - _____

Access Region	Actual or Time Factored Distance from the station to the last access point in traverse to the access region	Coordinates of last access point	Distance estimate technique to use from last access point to geo-grid location

TARGET HAZARD INPUT FORM - I4.5 ERAM

X COORDINATE	Y COORDINATE	HAZARD DESCRIPTION

Appendix B

REPORT SAMPLES

*** ERAM - DEMAND REGION STATISTICS REPORT FOR SCENERIO - DSWILSON ***

1st DUE						
CITYWIDE >	GEO-GRIDS = 657	ALARMS = 28	STRUCTURAL ALARMS = 25			
	AVERAGE TRAVEL TIME (MINUTES)	CURRENT = 2.06	PROPOSED = 1.98			
	WEIGHTED - STRUCTURAL	CURRENT = 2.20	PROPOSED = 2.01			
	WEIGHTED - TOTAL ALARMS	CURRENT = 2.29	PROPOSED = 2.06			
	MAX TRAVEL TIME	CURRENT = 4.20	PROPOSED = 3.20			
REGION 1 >	GEO-GRIDS = 285	ALARMS = 18	STRUCTURAL ALARMS = 18			
	AVERAGE TRAVEL TIME (MINUTES)	CURRENT = 2.01	PROPOSED = 1.80			
	WEIGHTED - STRUCTURAL	CURRENT = 2.23	PROPOSED = 1.91			
	WEIGHTED - TOTAL ALARMS	CURRENT = 2.23	PROPOSED = 1.91			
	MAX TRAVEL TIME	CURRENT = 3.50	PROPOSED = 3.00			
REGION 2 >	GEO-GRIDS = 153	ALARMS = 7	STRUCTURAL ALARMS = 5			
	AVERAGE TRAVEL TIME (MINUTES)	CURRENT = 2.37	PROPOSED = 2.16			
	WEIGHTED - STRUCTURAL	CURRENT = 2.26	PROPOSED = 2.02			
	WEIGHTED - TOTAL ALARMS	CURRENT = 2.49	PROPOSED = 2.10			
	MAX TRAVEL TIME	CURRENT = 4.20	PROPOSED = 3.20			
REGION 3 >	GEO-GRIDS = 219	ALARMS = 3	STRUCTURAL ALARMS = 2			
	AVERAGE TRAVEL TIME (MINUTES)	CURRENT = 1.89	PROPOSED = 2.10			
	WEIGHTED - STRUCTURAL	CURRENT = 1.85	PROPOSED = 2.85			
	WEIGHTED - TOTAL ALARMS	CURRENT = 2.20	PROPOSED = 2.87			
	MAX TRAVEL TIME	CURRENT = 3.20	PROPOSED = 3.20			

*** ERAM - DEMAND REGION STATISTICS REPORT FOR SCENERIO - DSWILSON ***

2nd DUE

CITYWIDE	>	GEO-GRIDS =	657	ALARMS =	28	STRUCTURAL ALARMS =	25
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	3.34	PROPOSED =	2.85	
		WEIGHTED - STRUCTURAL	CURRENT =	3.54	PROPOSED =	2.76	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.52	PROPOSED =	2.83	
		MAX TRAVEL TIME	CURRENT =	5.40	PROPOSED =	4.20	
REGION 1	>	GEO-GRIDS =	285	ALARMS =	18	STRUCTURAL ALARMS =	18
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	3.65	PROPOSED =	2.61	
		WEIGHTED - STRUCTURAL	CURRENT =	3.69	PROPOSED =	2.61	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.69	PROPOSED =	2.61	
		MAX TRAVEL TIME	CURRENT =	5.40	PROPOSED =	4.20	
REGION 2	>	GEO-GRIDS =	153	ALARMS =	7	STRUCTURAL ALARMS =	5
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	3.34	PROPOSED =	3.32	
		WEIGHTED - STRUCTURAL	CURRENT =	3.18	PROPOSED =	3.12	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.27	PROPOSED =	3.21	
		MAX TRAVEL TIME	CURRENT =	4.40	PROPOSED =	4.20	
REGION 3	>	GEO-GRIDS =	219	ALARMS =	3	STRUCTURAL ALARMS =	2
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	2.95	PROPOSED =	2.84	
		WEIGHTED - STRUCTURAL	CURRENT =	3.10	PROPOSED =	3.20	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.07	PROPOSED =	3.27	
		MAX TRAVEL TIME	CURRENT =	4.40	PROPOSED =	3.70	

*** ... DISTRIBUTION OF RESPONSE TIMES FOR SCENERIO - DSWILSON ***

1st DUE TRAVEL TIMES (MINUTES)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	> 5.0
# OF GEO-GRIDS											
CITYWIDE -CURRENT	2	40	142	171	166	76	43	16	1	0	0
-PROPOSED	2	40	136	173	206	97	3	0	0	0	0
REGION 1 - CURRENT	1	19	57	75	81	38	14	0	0	0	0
-PROPOSED	1	28	78	77	85	16	0	0	0	0	0
REGION 2 - CURRENT	1	12	33	15	25	23	27	16	1	0	0
-PROPOSED	0	3	26	37	47	39	1	0	0	0	0
REGION 3 - CURRENT	0	9	52	81	60	15	2	0	0	0	0
-PROPOSED	1	9	32	59	74	42	2	0	0	0	0

[illegible] DISTRIBUTION OF RESPONSE TIMES FOR SCENARIO - DSWILSON ---

2nd DUE TRAVEL TIMES (MINUTES)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	> 5.0
# OF GEO-GRIDS											
CITYWIDE -CURRENT	0	0	0	17	98	156	156	130	53	35	12
-PROPOSED	0	0	16	78	144	177	162	73	7	0	0
REGION 1 - CURRENT	0	0	0	3	32	42	59	67	35	35	12
-PROPOSED	0	0	16	61	71	64	49	22	2	0	0
REGION 2 - CURRENT	0	0	0	0	12	42	48	42	9	0	0
-PROPOSED	0	0	0	0	14	40	52	42	5	0	0
REGION 3 - CURRENT	0	0	0	14	54	72	49	21	9	0	0
-PROPOSED	0	0	0	17	59	73	61	9	0	0	0

*** ERAN - COMPANY STATISTICS REPORT FOR SCENERIO - DSWILSON ***

COMPANY DUE CURRENT	GEO-GRIDS 1st	GEO-GRIDS 2nd	AV TR T 1st	AV TR T 2nd	MAX TR T 1st	MAX TR T 2nd	STRUCTURAL 1st	STRUCTURAL 2nd	TOTAL ALARMS 1st	TOTAL ALARMS 2nd
E009020	215	442	1.9	3.5	3.9	4.2	5	20	6	22
E019010	442	215	2.1	3.0	4.2	5.4	20	5	22	6

*** ERAM - COMPANY STATISTICS REPORT FOR SCENERIO - DSWILSON ***

COMPANY DUE PROPOSED	GEO-GRIDS 1st	2nd	AV TR T 1st	2nd	MAX TR T 1st	2nd	STRUCTURAL 1st	2nd	TOTAL ALARMS 1st	2nd
E018018	319	338	2.0	2.8	3.2	4.2	16	9	18	10
E019010	338	319	2.0	2.9	3.2	4.2	9	16	10	18

*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

1st DUE - CITYWIDE

DEGRADED	>	GEO-GRIDS =	121	ALARMS =	4	STRUCTURAL ALARMS =	4
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	1.46	PROPOSED =	2.39	
		WEIGHTED - STRUCTURAL	CURRENT =	1.57	PROPOSED =	2.48	
		WEIGHTED - TOTAL ALARMS	CURRENT =	1.57	PROPOSED =	2.48	
		MAX TRAVEL TIME	CURRENT =	2.90	PROPOSED =	3.00	
IMPROVED	>	GEO-GRIDS =	219	ALARMS =	15	STRUCTURAL ALARMS =	13
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	2.62	PROPOSED =	1.88	
		WEIGHTED - STRUCTURAL	CURRENT =	2.56	PROPOSED =	1.91	
		WEIGHTED - TOTAL ALARMS	CURRENT =	2.63	PROPOSED =	1.96	
		MAX TRAVEL TIME	CURRENT =	4.20	PROPOSED =	3.20	
AFFECTED	>	GEO-GRIDS =	340	ALARMS =	19	STRUCTURAL ALARMS =	17
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	2.21	PROPOSED =	2.06	
		WEIGHTED - STRUCTURAL	CURRENT =	2.33	PROPOSED =	2.04	
		WEIGHTED - TOTAL ALARMS	CURRENT =	2.41	PROPOSED =	2.07	
		MAX TRAVEL TIME	CURRENT =	4.20	PROPOSED =	3.20	

*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

1st DUE - REGION 1

DEGRADED	>	GEO-GRIDS =	0	ALARMS =	0	STRUCTURAL ALARMS =	0
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	0.00	PROPOSED =	0.00	
		WEIGHTED - STRUCTURAL	CURRENT =	********	PROPOSED =	********	
		WEIGHTED - TOTAL ALARMS	CURRENT =	********	PROPOSED =	********	
		MAX TRAVEL TIME	CURRENT =	0.00	PROPOSED =	0.00	
IMPROVED	>	GEO-GRIDS =	94	ALARMS =	10	STRUCTURAL ALARMS =	10
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	2.46	PROPOSED =	1.80	
		WEIGHTED - STRUCTURAL	CURRENT =	2.46	PROPOSED =	1.89	
		WEIGHTED - TOTAL ALARMS	CURRENT =	2.46	PROPOSED =	1.89	
		MAX TRAVEL TIME	CURRENT =	3.50	PROPOSED =	2.90	
AFFECTED	>	GEO-GRIDS =	94	ALARMS =	10	STRUCTURAL ALARMS =	10
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	2.46	PROPOSED =	1.80	
		WEIGHTED - STRUCTURAL	CURRENT =	2.46	PROPOSED =	1.89	
		WEIGHTED - TOTAL ALARMS	CURRENT =	2.46	PROPOSED =	1.89	
		MAX TRAVEL TIME	CURRENT =	3.50	PROPOSED =	2.90	

*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

1st DUE - REGION 2

DEGRADED	>	GEO-GRIDS =	45	ALARMS =	2	STRUCTURAL ALARMS =	2
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	1.15	PROPOSED =	2.31	
		WEIGHTED - STRUCTURAL	CURRENT =	1.30	PROPOSED =	2.10	
		WEIGHTED - TOTAL ALARMS	CURRENT =	1.30	PROPOSED =	2.10	
		MAX TRAVEL TIME	CURRENT =	1.70	PROPOSED =	3.00	
IMPROVED	>	GEO-GRIDS =	105	ALARMS =	5	STRUCTURAL ALARMS =	3
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	2.91	PROPOSED =	2.11	
		WEIGHTED - STRUCTURAL	CURRENT =	2.90	PROPOSED =	1.97	
		WEIGHTED - TOTAL ALARMS	CURRENT =	2.96	PROPOSED =	2.10	
		MAX TRAVEL TIME	CURRENT =	4.20	PROPOSED =	3.20	
AFFECTED	>	GEO-GRIDS =	150	ALARMS =	7	STRUCTURAL ALARMS =	5
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	2.39	PROPOSED =	2.17	
		WEIGHTED - STRUCTURAL	CURRENT =	2.26	PROPOSED =	2.02	
		WEIGHTED - TOTAL ALARMS	CURRENT =	2.49	PROPOSED =	2.10	
		MAX TRAVEL TIME	CURRENT =	4.20	PROPOSED =	3.20	

*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

1st DUE - REGION 3

DEGRADED	>	GEO-GRIDS =	76	ALARMS =	2	STRUCTURAL ALARMS =	2
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	1.64	PROPOSED =	2.43
		WEIGHTED - STRUCTURAL		CURRENT =	1.85	PROPOSED =	2.85
		WEIGHTED - TOTAL ALARMS		CURRENT =	1.85	PROPOSED =	2.85
		MAX TRAVEL TIME		CURRENT =	2.90	PROPOSED =	3.00
IMPROVED	>	GEO-GRIDS =	20	ALARMS =	0	STRUCTURAL ALARMS =	0
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	1.84	PROPOSED =	1.05
		WEIGHTED - STRUCTURAL		CURRENT =	********	PROPOSED =	********
		WEIGHTED - TOTAL ALARMS		CURRENT =	********	PROPOSED =	********
		MAX TRAVEL TIME		CURRENT =	2.20	PROPOSED =	1.70
AFFECTED	>	GEO-GRIDS =	96	ALARMS =	2	STRUCTURAL ALARMS =	2
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	1.68	PROPOSED =	2.14
		WEIGHTED - STRUCTURAL		CURRENT =	1.85	PROPOSED =	2.85
		WEIGHTED - TOTAL ALARMS		CURRENT =	1.85	PROPOSED =	2.85
		MAX TRAVEL TIME		CURRENT =	2.90	PROPOSED =	3.00

*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

2nd DUE - CITY WIDE

DEGRADED	>	GEO-GRIDS =	49	ALARMS =	2	STRUCTURAL ALARMS =	1
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	2.79	PROPOSED =	3.06
		WEIGHTED - STRUCTURAL		CURRENT =	3.00	PROPOSED =	3.20
		WEIGHTED - TOTAL ALARMS		CURRENT =	3.00	PROPOSED =	3.30
		MAX TRAVEL TIME		CURRENT =	3.40	PROPOSED =	3.70
IMPROVED	>	GEO-GRIDS =	375	ALARMS =	20	STRUCTURAL ALARMS =	19
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	3.61	PROPOSED =	2.71
		WEIGHTED - STRUCTURAL		CURRENT =	3.71	PROPOSED =	2.67
		WEIGHTED - TOTAL ALARMS		CURRENT =	3.70	PROPOSED =	2.70
		MAX TRAVEL TIME		CURRENT =	5.40	PROPOSED =	4.20
AFFECTED	>	GEO-GRIDS =	424	ALARMS =	22	STRUCTURAL ALARMS =	20
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	3.51	PROPOSED =	2.75
		WEIGHTED - STRUCTURAL		CURRENT =	3.67	PROPOSED =	2.69
		WEIGHTED - TOTAL ALARMS		CURRENT =	3.63	PROPOSED =	2.76
		MAX TRAVEL TIME		CURRENT =	5.40	PROPOSED =	4.20

*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

2nd DUE - REGION 1

DEGRADED	>	GEO-GRIDS =	0	ALARMS =	0	STRUCTURAL ALARMS =	0
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	0.00	PROPOSED =	0.00	
		WEIGHTED - STRUCTURAL	CURRENT =	********	PROPOSED =	********	
		WEIGHTED - TOTAL ALARMS	CURRENT =	********	PROPOSED =	********	
		MAX TRAVEL TIME	CURRENT =	0.00	PROPOSED =	0.00	
IMPROVED	>	GEO-GRIDS =	282	ALARMS =	18	STRUCTURAL ALARMS =	18
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	3.65	PROPOSED =	2.60	
		WEIGHTED - STRUCTURAL	CURRENT =	3.69	PROPOSED =	2.61	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.69	PROPOSED =	2.61	
		MAX TRAVEL TIME	CURRENT =	5.40	PROPOSED =	4.20	
AFFECTED	>	GEO-GRIDS =	282	ALARMS =	18	STRUCTURAL ALARMS =	18
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	3.65	PROPOSED =	2.60	
		WEIGHTED - STRUCTURAL	CURRENT =	3.69	PROPOSED =	2.61	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.69	PROPOSED =	2.61	
		MAX TRAVEL TIME	CURRENT =	5.40	PROPOSED =	4.20	

*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

2nd DUE - REGION 2

DEGRADED	>	GEO-GRIDS =	0	ALARMS =	0	STRUCTURAL ALARMS =	0
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	0.00	PROPOSED =	0.00	
		WEIGHTED - STRUCTURAL	CURRENT =	********	PROPOSED =	********	
		WEIGHTED - TOTAL ALARMS	CURRENT =	********	PROPOSED =	********	
		MAX TRAVEL TIME	CURRENT =	0.00	PROPOSED =	0.00	
IMPROVED	>	GEO-GRIDS =	17	ALARMS =	2	STRUCTURAL ALARMS =	1
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	3.69	PROPOSED =	3.44	
		WEIGHTED - STRUCTURAL	CURRENT =	4.00	PROPOSED =	3.70	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.75	PROPOSED =	3.55	
		MAX TRAVEL TIME	CURRENT =	4.40	PROPOSED =	4.20	
AFFECTED	>	GEO-GRIDS =	17	ALARMS =	2	STRUCTURAL ALARMS =	1
		AVERAGE TRAVEL TIME (MINUTES)	CURRENT =	3.69	PROPOSED =	3.44	
		WEIGHTED - STRUCTURAL	CURRENT =	4.00	PROPOSED =	3.70	
		WEIGHTED - TOTAL ALARMS	CURRENT =	3.75	PROPOSED =	3.55	
		MAX TRAVEL TIME	CURRENT =	4.40	PROPOSED =	4.20	

*** ERAN - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - DSWILSON ***

2nd DUE - REGION 3

DEGRADED	>	GEO-GRIDS =	49	ALARMS =	2	STRUCTURAL ALARMS =	1
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	2.79	PROPOSED =	3.06
		WEIGHTED - STRUCTURAL		CURRENT =	3.00	PROPOSED =	3.20
		WEIGHTED - TOTAL ALARMS		CURRENT =	3.00	PROPOSED =	3.30
		MAX TRAVEL TIME		CURRENT =	3.40	PROPOSED =	3.70
IMPROVED	>	GEO-GRIDS =	76	ALARMS =	0	STRUCTURAL ALARMS =	0
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	3.43	PROPOSED =	2.92
		WEIGHTED - STRUCTURAL		CURRENT =	********	PROPOSED =	********
		WEIGHTED - TOTAL ALARMS		CURRENT =	********	PROPOSED =	********
		MAX TRAVEL TIME		CURRENT =	4.40	PROPOSED =	3.70
AFFECTED	>	GEO-GRIDS =	125	ALARMS =	2	STRUCTURAL ALARMS =	1
		AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	3.18	PROPOSED =	2.98
		WEIGHTED - STRUCTURAL		CURRENT =	3.00	PROPOSED =	3.20
		WEIGHTED - TOTAL ALARMS		CURRENT =	3.00	PROPOSED =	3.30
		MAX TRAVEL TIME		CURRENT =	4.40	PROPOSED =	3.70

*** ERAM - TARGET HAZARD STATISTICS REPORT FOR SCENERIO = DSWILSON ***

1st DUE
CITYWIDE >

GEO-GRIDS =	3	ALARMS =	0	STRUCTURAL ALARMS =	0
AVERAGE TRAVEL TIME (MINUTES)		CURRENT =	2.53	PROPOSED =	2.03
WEIGHTED - STRUCTURAL		CURRENT =	********	PROPOSED =	********
WEIGHTED - TOTAL ALARMS		CURRENT =	********	PROPOSED =	********
MAX TRAVEL TIME		CURRENT =	3.70	PROPOSED =	2.70

TRAVEL TIME TO TARGET LOCATIONS

LOCATION =	1.4 , 0.3	CURRENT =	2.20	PROPOSED =	2.20
LOCATION =	1.5 , 1.8	CURRENT =	1.70	PROPOSED =	1.20
LOCATION =	2.7 , 2.6	CURRENT =	3.70	PROPOSED =	2.70

*** ERAM - TARGET HAZARD STATISTICS REPORT FOR SCENERIO = DSWILSON ***

2nd DUE

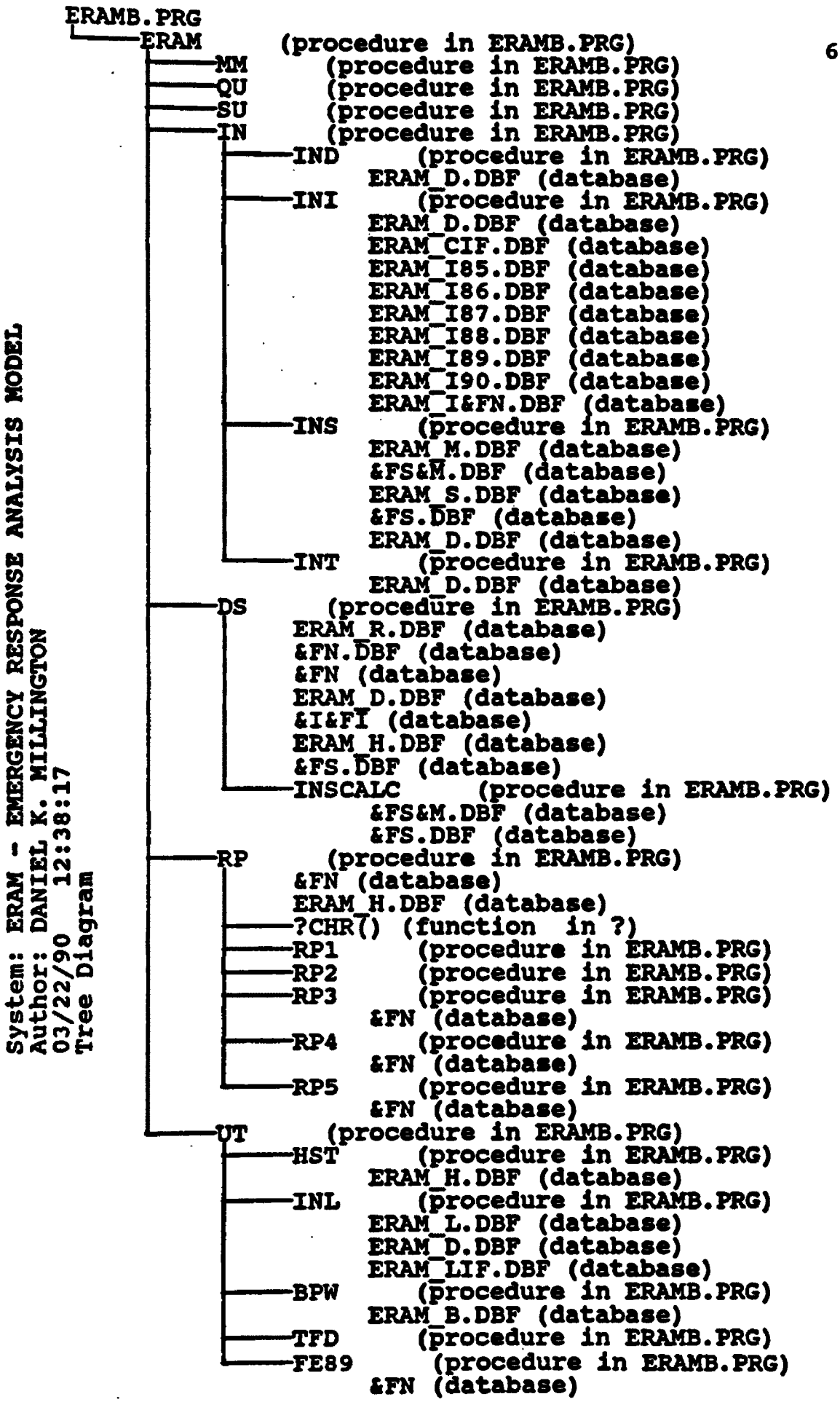
CITYWIDE >	GEO-GRIDS = 3	ALARMS = 0	STRUCTURAL ALARMS =		0
	AVERAGE TRAVEL TIME (MINUTES)	CURRENT = 3.27	PROPOSED =	3.10	
	WEIGHTED - STRUCTURAL	CURRENT = ********	PROPOSED =	********	
	WEIGHTED - TOTAL ALARMS	CURRENT = ********	PROPOSED =	********	
	MAX TRAVEL TIME	CURRENT = 3.90	PROPOSED =	3.70	

TRAVEL TIME TO TARGET LOCATIONS

LOCATION = 1.4 , 0.3	CURRENT = 3.70	PROPOSED =	3.40
LOCATION = 1.5 , 1.8	CURRENT = 2.20	PROPOSED =	2.20
LOCATION = 2.7 , 2.6	CURRENT = 3.90	PROPOSED =	3.70

Appendix C

PROGRAM



03/26/90 ERAMB.PRG
14:53 Copyright, DANIEL K. MILLINGTON, 1988
ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1  SET PROCEDURE TO eramb
2  DO eram
3  ************************************************************
4  *                          ERAM                            *
5  ************************************************************
6  PROCEDURE eram
7  CLEAR ALL
8  SET DEVICE TO SCREEN
9  SET TALK OFF
10 SET SAFETY OFF
11 *SET ECHO OFF
12 SET STATUS OFF
13 C=" "
14 CLEAR
15 @ 5,32 SAY "WELCOME TO"
16 @ 8,30 SAY "***  ERAM  ***"
17 @ 11,20 SAY "EMERGENCY RESPONSE ANALYSIS MODEL"
18 @ 20,5 SAY " "
19 WAIT
20 DO WHILE UPPER(C)<>"Q"
21    DO mm
22    DO CASE
23    CASE UPPER(C)="Q"
24       DO qu
25    CASE UPPER(C)="S"
26       DO su
27    CASE UPPER(C)="I"
28       DO in
29    CASE UPPER(C)="D"
30       DO ds
31    CASE UPPER(C)="R"
32       DO rp
33    CASE UPPER(C)="U"
34       DO ut
35    ENDCASE
36 ENDDO
37 QUIT
38 ************************************************************
39 *                          SU                              *
40 ************************************************************
41 PROCEDURE su
42 C=" "
43 CLEAR
44 @ 2,31 SAY "*** SETUP MENU ***"
45 @ 5,5 SAY "PLEASE ENTER YOUR SELECTION (M/F) > " GET C
```

```
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@ 10,5 SAY " N - FOR HARD DISK INSTALLATION / OPERATION"
@ 12,5 SAY " F - FOR FLOPPY DISK INSTALLATION / OPERATION"
READ
DO CASE
CASE UPPER(C)="N"
   D=" "
   @ 5,5 CLEAR
   @ 5,5 SAY "LEAVE ERAM DISK IN DRIVE "
   @ 10,5 SAY "ENTER HARD DISK DRIVE YOU WISH TO INSTALL ERAM ON > " GET D
   READ
   IF FILE("&D:\ERAM\ERAM_D.DBF")
      @ 5,5 CLEAR
      @ 5,5 SAY "ERAM ALREADY INSTALLED ON DRIVE &D"
      @ 7,5 SAY " "
      WAIT
   ELSE
      !&d:
      !md\eram
      !COPY *.* &d:\eram
      !COPY eramhd.bat &d:\eram.bat
   ENDIF
   !&d:
   !cd\eram
   SET DEFAULT TO &d:\eram
CASE UPPER(C)="F"
   CLEAR
   @ 5,5 SAY "LEAVE ERAM DISK IN DRIVE "
   *@ 10,5 SAY "ENTER FLOPPY DISK DRIVE YOU WISH DATA TO BE STORED TO > " GET D
ENDCASE
CLEAR
@ 18,5 SAY " "
WAIT
C=" "
RETURN
*****************************************************************
*                          UT                                   *
*****************************************************************
PROCEDURE ut
DO WHILE UPPER(C)<>"Q"
   y=" "
   C="  "
   D=" "
   CLEAR
   @ 2,40 SAY "**** UTILITY MENU ****"
   @ 4,5 SAY "PLEASE ENTER YOUR SELECTION (B/R/D/L/WB/WT/E/Q) >" GET C
```

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```

```
91    @ 6,5 SAY "B - BACKUP ERAM FILES FROM HARD DISK TO FLOPPY"
92    @ 8,5 SAY "R - RESTORE ERAM FILES FROM FLOPPY TO HARD DISK"
93    @ 10,5 SAY "D - DEPLOYMENT SCENERIO LISTING"
94    @ 12,5 SAY "L - LOCATION INFORMATION LISTING"
95    @ 14,5 SAY "WB - WORKSHEET FOR ACCESS REGION BREAK POINTS"
96    @ 16,5 SAY "WT - WORKSHEET FOR TIME FACTORED DISTANCE CALCULATIONS"
97    @ 18,5 SAY "E - EDIT AN EXISTING DATA BASE"
98    @ 20,5 SAY "Q - QUIT"
99    READ
100   DO CASE
101   CASE UPPER(C)="Q"
102      EXIT
103   CASE UPPER(C)="B"
104      @ 5,0 CLEAR
105      @ 5,5 SAY "BACKUP TO WHICH DRIVE (A/B) >" GET D
106      READ
107      @ 10,5 SAY "PLACE BACKUP DISK IN DRIVE &D"
108      @ 12,5 SAY " "
109      WAIT
110      !backup \eram\*.* &d:
111      CLEAR
112      @ 2,30 SAY "*** UTILITY MENU ***"
113      @ 5,5 SAY "BACKUP IS COMPLETE"
114      WAIT
115   CASE UPPER(C)="R"
116      @ 5,0 CLEAR
117      @ 5,5 SAY "RESTORE FROM WHICH DRIVE (A/B) >" GET D
118      READ
119      @ 10,5 SAY "PLACE BACKUP DISK IN DRIVE &D:"
120      @ 12,5 SAY " "
121      WAIT
122      !RESTORE &d: \eram\*.*
123      CLEAR
124      @ 2,30 SAY "*** UTILITY MENU ***"
125      @ 5,5 SAY "RESTORE IS COMPLETE"
126      WAIT
127   CASE UPPER(C)="D"
128      DO hst
129   CASE UPPER(C)="L"
130      DO inl
131   CASE UPPER(C)="WB"
132      DO bpw
133   CASE UPPER(C)="WT"
134      DO tfd
135   CASE UPPER(C)="E"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
136       DO fe89
137    ENDCASE
138    c=" "
139 ENDDO
140 c=" "
141 RETURN
142 ************************************************************
143 *                          RP                              *
144 ************************************************************
145 PROCEDURE rp
146 N=00.5
147 cd=0
148 cd=0
149 cp=0
150 r1=" "
151 r2=" "
152 r3=" "
153 r4=" "
154 r5=" "
155 r6=" "
156 prnt=" "
157 c=" "
158 fn="        "
159 CLEAR
160 @ 2,30 SAY "*** REPORT MENU ***"
161 DO WHILE UPPER(fn)<>"QUIT"
162    fn="        "
163    @ 3,0 CLEAR
164    @ 5,5 SAY "ENTER DEPLOYMENT SCENERIO FILENAME TO BASE REPORTS ON >" GET fn
165    @ 7,5 SAY "filename - DEPLOYMENT SCENERIO FILE"
166    @ 9,5 SAY "QUIT - SPELL OUT FULL WORD TO QUIT"
167    READ
168    IF UPPER(fn)="QUIT"
169       EXIT
170    ENDIF
171    USE &fn
172    SET UNIQUE ON
173    INDEX ON ddr TO INDEX
174    COUNT TO cd
175    SET UNIQUE OFF
176    USE eram_h
177    COUNT FOR UPPER(FILE)="&FN" .AND. UPPER(c_p)="C" TO cc
178    COUNT FOR UPPER(FILE)="&FN" .AND. UPPER(c_p)="P" TO cp
179    USE &fn
180    @ 7,0 CLEAR
```

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181     @ 7,5 SAY "SELECT PRINTER IBM/EPSON/OKIDATA/HP LASER JET  (I/E/O/H) >"GET prnt
182     @ 10,5 SAY "PLEASE SELECT REPORTS FROM LIST BELOW,  MARK WITH 'Y'  (Y/N)"
183     @ 12,5 SAY "DEMAND REGION STATISTICS              >" GET r1
184     @ 14,5 SAY "DISTRIBUTION OF RESPONSE TIMES        >" GET r2
185     @ 16,5 SAY "COMPANY STATISTICS                    >" GET r3
186     @ 18,5 SAY "DEPLOYMENT SCENERIO AFFECT            >" GET r4
187     @ 20,5 SAY "TARGET HAZARD STATISTICS              >" GET r5
188     READ
189     DO CASE
190     CASE UPPER(prnt)="I"
191        SET PRINT ON
192        ?CHR(15)
193        SET PRINT OFF
194     CASE UPPER(prnt)="E"
195        SET PRINT ON
196        ?CHR(15)
197        SET PRINT OFF
198     CASE UPPER(prnt)="O"
199        SET PRINT ON
200        ?CHR(29)
201        SET PRINT OFF
202     CASE UPPER(prnt)="H"
203        SET PRINT ON
204        p=CHR(27)+"&k2S"
205        SET PRINT OFF
206     ENDCASE
207     IF UPPER(r2)="Y"
208        @ 7,0 CLEAR
209        @ 7,5 SAY "ENTER INTERVAL FOR RESPONSE TIME HISTOGRAM (IN MINUTES) >" GET H PI
209  CTURE "99.9"
210        READ
211     ENDIF
212     EJECT
213     IF UPPER(r1)="Y"
214        DO rp1
215     ENDIF
216     IF UPPER(r2)="Y"
217        DO rp2
218     ENDIF
219     IF UPPER(r3)="Y"
220        DO rp3
221     ENDIF
222     IF UPPER(r4)="Y"
223        DO rp4
224     ENDIF
```

```
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225     IF UPPER(r5)="Y"
226        DO rp5
227     ENDIF
228  ENDDO
229  RETURN
230  ************************************************************
231  *                          RP4                             *
232  ************************************************************
233  PROCEDURE rp4
234  USE &fn
235  dsat=1
236  SET DEVICE TO PRINT
237  @ 1,32 SAY "**** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - &FN ****"
238  @ 3,25 SAY "1st DUE - CITYWIDE"
239  SET DEVICE TO SCREEN
240  DO WHILE dsat<=3
241     DO CASE
242     CASE dsat=1
243        SET DELETED OFF
244        RECALL ALL
245        DELETE ALL FOR r1ct>=r1pt
246        SET DELETED ON
247        dsan="DEGRADED"
248     CASE dsat=2
249        SET DELETED OFF
250        RECALL ALL
251        DELETE ALL FOR r1ct<=r1pt
252        SET DELETED ON
253        dsan="IMPROVED"
254     CASE dsat=3
255        SET DELETED OFF
256        RECALL ALL
257        DELETE ALL FOR r1ct=r1pt
258        SET DELETED ON
259        dsan="AFFECTED"
260     ENDCASE
261     @ 7,0 CLEAR
262     @ 7,5 SAY "PROCESSING DEMAND REGION STATISTICS REPORT"
263     r1cm=0
264     r1pm=0
265     COUNT TO cnb
266     SUM isa,(isa+ioa) TO cns,cns
267     SUM r1ct*isa,r1ct*(ioa+isa),r1pt*isa,r1pt*(ioa+isa) TO cw1csx,cw1ctx,cw1psx,cw1pt
267  x
268     cw1cs=cw1csx/cns
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
269     cw1ct=cw1ctx/cws
270     cw1ps=cw1psx/cws
271     cw1pt=cw1ptx/cws
272     AVERAGE r1ct,r1pt TO cw1c,cw1p
273     GO TOP
274     DO WHILE .NOT. EOF()
275        IF r1cm < r1ct
276           r1cm = r1ct
277        ENDIF
278        IF r1pm < r1pt
279           r1pm = r1pt
280        ENDIF
281        SKIP
282     ENDDO
283     SET DEVICE TO PRINT
284     @ PROW()+3,25 SAY "&DSAN   > "
285     @ PROW(),50 SAY "GEO-GRIDS = "+STR(cwb,8,0)
286     @ PROW(),80 SAY "ALARMS = "+STR(cws,8,0)
287     @ PROW(),100 SAY "STRUCTURAL ALARMS = "+STR(cwss,8,0)
288     @ PROW()+1,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
289     @ PROW(),80 SAY "CURRENT = "+STR(cw1c,8,2)
290     @ PROW(),100 SAY "PROPOSED = "+STR(cw1p,8,2)
291     @ PROW()+1,50 SAY "WEIGHTED - STRUCTURAL"
292     @ PROW(),80 SAY "CURRENT = "+STR(cw1cs,8,2)
293     @ PROW(),100 SAY "PROPOSED = "+STR(cw1ps,8,2)
294     @ PROW()+1,50 SAY "WEIGHTED - TOTAL ALARMS"
295     @ PROW(),80 SAY "CURRENT = "+STR(cw1ct,8,2)
296     @ PROW(),100 SAY "PROPOSED = "+STR(cw1pt,8,2)
297     @ PROW()+1,50 SAY "MAX TRAVEL TIME"
298     @ PROW(),80 SAY "CURRENT = "+STR(r1cm,8,2)
299     @ PROW(),100 SAY "PROPOSED = "+STR(r1pm,8,2)
300     SET DEVICE TO SCREEN
301     dsat=dsat+1
302  ENDDO
303  SET DEVICE TO PRINT
304  EJECT
305  SET DEVICE TO SCREEN
306  cnt=1
307  DO WHILE cnt<=cd
308     scnt=STR(cnt,2,0)
309     SET DEVICE TO PRINT
310     @ 1,32 SAY "**** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - &FN ****"
311     @ 3,25 SAY "1st DUE - REGION &SCNT"
312     SET DEVICE TO SCREEN
313     dsat=1
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
314     DO WHILE dsat<=3
315        DO CASE
316        CASE dsat=1
317           SET DELETED OFF
318           RECALL ALL
319           DELETE ALL FOR rict>=ript
320           SET DELETED ON
321           dsan="DEGRADED"
322        CASE dsat=2
323           SET DELETED OFF
324           RECALL ALL
325           DELETE ALL FOR rict<=ript
326           SET DELETED ON
327           dsan="IMPROVED"
328        CASE dsat=3
329           SET DELETED OFF
330           RECALL ALL
331           DELETE ALL FOR rict=ript
332           SET DELETED ON
333           dsan="AFFECTED"
334        ENDCASE
335        ricm=0
336        ripm=0
337        COUNT FOR VAL(ddr)=cnt TO cwb
338        SUM isa,(isa+ioa) FOR VAL(ddr)=cnt TO cws,cwa
339        SUM rict*isa,rict*(ioa+isa),ript*isa,ript*(ioa+isa) FOR VAL(ddr)=cnt TO cwicsx
339  ,cwictx,cwipsx,cwiptx
340        cwics=cwicsx/cws
341        cwict=cwictx/cwa
342        cwips=cwipsx/cws
343        cwipt=cwiptx/cwa
344        AVERAGE rict,ript FOR VAL(ddr)=cnt TO cwic,cwip
345        GO TOP
346        DO WHILE .NOT. EOF()
347           IF VAL(ddr)=cnt
348              IF ricm < rict
349                 ricm = rict
350              ENDIF
351              IF ripm < ript
352                 ripm = ript
353              ENDIF
354           ENDIF
355           SKIP
356        ENDDO
357        scnt=STR(cnt,2,0)
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
358         SET DEVICE TO PRINT
359         @ PROW()+3,25 SAY "&DSAN   > "
360         @ PROW(),50 SAY "GEO-GRIDS = "+STR(cwb,8,0)
361         @ PROW(),80 SAY "ALARMS = "+STR(cwa,8,0)
362         @ PROW(),100 SAY "STRUCTURAL ALARMS = "+STR(cws,8,0)
363         @ PROW()+1,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
364         @ PROW(),80 SAY "CURRENT = "+STR(cw1c,8,2)
365         @ PROW(),100 SAY "PROPOSED = "+STR(cw1p,8,2)
366         @ PROW()+1,50 SAY "WEIGHTED - STRUCTURAL"
367         @ PROW(),80 SAY "CURRENT = "+STR(cw1cs,8,2)
368         @ PROW(),100 SAY "PROPOSED = "+STR(cw1ps,8,2)
369         @ PROW()+1,50 SAY "WEIGHTED - TOTAL ALARMS"
370         @ PROW(),80 SAY "CURRENT = "+STR(cw1ct,8,2)
371         @ PROW(),100 SAY "PROPOSED = "+STR(cw1pt,8,2)
372         @ PROW()+1,50 SAY "MAX TRAVEL TIME"
373         @ PROW(),80 SAY "CURRENT = "+STR(r1cm,8,2)
374         @ PROW(),100 SAY "PROPOSED = "+STR(r1pm,8,2)
375         SET DEVICE TO SCREEN
376         dsat=dsat+1
377      ENDDO
378      SET DEVICE TO PRINT
379      EJECT
380      SET DEVICE TO SCREEN
381      cnt=cnt+1
382   ENDDO
383   dsat=1
384   SET DEVICE TO PRINT
385   @ 1,32 SAY "**** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - &FN ****"
386   @ 3,25 SAY "2nd DUE - CITY WIDE"
387   SET DEVICE TO SCREEN
388   DO WHILE dsat<=3
389      DO CASE
390      CASE dsat=1
391         SET DELETED OFF
392         RECALL ALL
393         DELETE ALL FOR r2ct>=r2pt
394         SET DELETED ON
395         dsan="DEGRADED"
396      CASE dsat=2
397         SET DELETED OFF
398         RECALL ALL
399         DELETE ALL FOR r2ct<=r2pt
400         SET DELETED ON
401         dsan="IMPROVED"
402      CASE dsat=3
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
403         SET DELETED OFF
404         RECALL ALL
405         DELETE ALL FOR r2ct=r2pt
406         SET DELETED ON
407         dsen="AFFECTED"
408      ENDCASE
409      @ 7,0 CLEAR
410      @ 7,5 SAY "PROCESSING DEMAND REGION STATISTICS REPORT"
411      r2cm=0
412      r2pm=0
413      COUNT TO cwb
414      SUM isa,(isa+ioa) TO cws,cwa
415      SUM r2ct*isa,r2ct*(ioa+isa),r2pt*isa,r2pt*(ioa+isa) TO cw2csx,cw2ctx,cw2psx,cw2pt
415  x
416      cw2cs=cw2csx/cws
417      cw2ct=cw2ctx/cwa
418      cw2ps=cw2psx/cws
419      cw2pt=cw2ptx/cwa
420      AVERAGE r2ct,r2pt TO cw2c,cw2p
421      GO TOP
422      DO WHILE .NOT. EOF()
423         IF r2cm < r2ct
424            r2cm = r2ct
425         ENDIF
426         IF r2pm < r2pt
427            r2pm = r2pt
428         ENDIF
429         SKIP
430      ENDDO
431      SET DEVICE TO PRINT
432      @ PROW()+3,25 SAY "&DSAN   > "
433      @ PROW(),50 SAY "GEO-GRIDS = "+STR(cwb,8,0)
434      @ PROW(),80 SAY "ALARMS = "+STR(cwa,8,0)
435      @ PROW(),100 SAY "STRUCTURAL ALARMS = "+STR(cws,8,0)
436      @ PROW()+1,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
437      @ PROW(),80 SAY "CURRENT = "+STR(cw2c,8,2)
438      @ PROW(),100 SAY "PROPOSED = "+STR(cw2p,8,2)
439      @ PROW()+1,50 SAY "WEIGHTED - STRUCTURAL"
440      @ PROW(),80 SAY "CURRENT = "+STR(cw2cs,8,2)
441      @ PROW(),100 SAY "PROPOSED = "+STR(cw2ps,8,2)
442      @ PROW()+1,50 SAY "WEIGHTED - TOTAL ALARMS"
443      @ PROW(),80 SAY "CURRENT = "+STR(cw2ct,8,2)
444      @ PROW(),100 SAY "PROPOSED = "+STR(cw2pt,8,2)
445      @ PROW()+1,50 SAY "MAX TRAVEL TIME"
446      @ PROW(),80 SAY "CURRENT = "+STR(r2cm,8,2)
```

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```
447     @ PROW(),100 SAY "PROPOSED = "+STR(r2pm,8,2)
448     SET DEVICE TO SCREEN
449     dsat=dsat+1
450  ENDDO
451  SET DEVICE TO PRINT
452  EJECT
453  SET DEVICE TO SCREEN
454  cnt=1
455  DO WHILE cnt<=cd
456     scnt=STR(cnt,2,0)
457     SET DEVICE TO PRINT
458     @ 1,32 SAY "*** ERAM - DEPLOYMENT SCENERIO AFFECT REPORT FOR SCENERIO - &FN ***"
459     @ 3,25 SAY "2nd DUE - REGION &SCNT"
460     SET DEVICE TO SCREEN
461     dsat=1
462     DO WHILE dsat<=3
463        DO CASE
464        CASE dsat=1
465           SET DELETED OFF
466           RECALL ALL
467           DELETE ALL FOR r2ct>=r2pt
468           SET DELETED ON
469           dsan="DEGRADED"
470        CASE dsat=2
471           SET DELETED OFF
472           RECALL ALL
473           DELETE ALL FOR r2ct<=r2pt
474           SET DELETED ON
475           dsan="IMPROVED"
476        CASE dsat=3
477           SET DELETED OFF
478           RECALL ALL
479           DELETE ALL FOR r2ct=r2pt
480           SET DELETED ON
481           dsan="AFFECTED"
482        ENDCASE
483        r2cm=0
484        r2pm=0
485        COUNT FOR VAL(ddr)=cnt TO cwb
486        SUM isa,(isa+ioa) FOR VAL(ddr)=cnt TO cws,cwa
487        SUM r2ct*isa,r2ct*(ioa+isa),r2pt*isa,r2pt*(ioa+isa) FOR VAL(ddr)=cnt TO cw2csx
487  ,cw2ctx,cw2psx,cw2ptx
488        cw2ca=cw2csx/cws
489        cw2ct=cw2ctx/cwa
490        cw2pa=cw2psx/cws
```

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491         cw2pt=cw2ptx/cwa
492         AVERAGE r2ct,r2pt FOR VAL(ddr)=cnt TO cw2c,cw2p
493         GO TOP
494         DO WHILE .NOT. EOF()
495            IF VAL(ddr)=cnt
496               IF r2cm < r2ct
497                  r2cm = r2ct
498               ENDIF
499               IF r2pm < r2pt
500                  r2pm = r2pt
501               ENDIF
502            ENDIF
503            SKIP
504         ENDDO
505         scnt=STR(cnt,2,0)
506         SET DEVICE TO PRINT
507         @ PROW()+3,25 SAY "&DSAN   > "
508         @ PROW(),50 SAY "GEO-GRIDS = "+STR(cwb,8,0)
509         @ PROW(),80 SAY "ALARMS = "+STR(cwa,8,0)
510         @ PROW(),100 SAY "STRUCTURAL ALARMS = "+STR(cws,8,0)
511         @ PROW()+1,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
512         @ PROW(),80 SAY "CURRENT = "+STR(cw2c,8,2)
513         @ PROW(),100 SAY "PROPOSED = "+STR(cw2p,8,2)
514         @ PROW()+1,50 SAY "WEIGHTED - STRUCTURAL"
515         @ PROW(),80 SAY "CURRENT = "+STR(cw2cs,8,2)
516         @ PROW(),100 SAY "PROPOSED = "+STR(cw2ps,8,2)
517         @ PROW()+1,50 SAY "WEIGHTED - TOTAL ALARMS"
518         @ PROW(),80 SAY "CURRENT = "+STR(cw2ct,8,2)
519         @ PROW(),100 SAY "PROPOSED = "+STR(cw2pt,8,2)
520         @ PROW()+1,50 SAY "MAX TRAVEL TIME"
521         @ PROW(),80 SAY "CURRENT = "+STR(r2cm,8,2)
522         @ PROW(),100 SAY "PROPOSED = "+STR(r2pm,8,2)
523         SET DEVICE TO SCREEN
524         dsat=dsat+1
525      ENDDO
526      SET DEVICE TO PRINT
527      EJECT
528      SET DEVICE TO SCREEN
529      cnt=cnt+1
530   ENDDO
531   SET DELETED OFF
532   RECALL ALL
533   RETURN
534   ************************************************************
535   *                          IND                             *
```

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```
536 *************************************************************
537 PROCEDURE ind
538 C=" "
539 slx=00.0
540 sly=00.0
541 flx=00.0
542 idr=" "
543 D=" "
544 @ 2,24 SAY "**** DEMAND REGION DATA INPUT ****
545 USE eram_d
546 GO BOTT
547 IF EOF()
548    @ 5,0 CLEAR
549    @ 5,5 SAY "ENTER STARTING X COORDINATE  >" GET slx PICTURE "99.9"
550    @ 7,5 SAY "ENTER STARTING Y COORDINATE  >" GET sly PICTURE "99.9"
551    @ 9,5 SAY "ENTER STARTING DEMAND REGION >" GET idr
552    READ
553    APPEND Blank
554    REPLACE lx WITH slx
555    REPLACE ly WITH sly
556    REPLACE ddr WITH idr
557 ENDIF
558 DO WHILE UPPER(C)<>"Q"
559    DO WHILE UPPER(idr)<>"N" .AND. UPPER(idr)<>"Q"
560       GO BOTT
561       *IF DDR<>" "
562       slx=lx+0.1
563       *ELSE
564       * SLX=LX
565       *ENDIF
566       sly=ly
567       @ 5,0 CLEAR
568       @ 5,5 SAY "START COORDINATE IS  >  "+STR(slx,4,1)+" , "+STR(sly,4,1)
569       @ 7,5 SAY "ENTER DEMAND REGION NUMBER / NEXT ROW / QUIT (#/N/Q) >"GET idr
570       READ
571       DO CASE
572       CASE UPPER(idr)="Q"
573          EXIT
574       CASE UPPER(idr)="N"
575          slx=00.0
576          @ 5,0 CLEAR
577          @ 5,5 SAY "ENTER NEW STARTING X COORDINATE >" GET slx PICTURE "99.9"
578          READ
579          APPEND Blank
580          REPLACE lx WITH slx
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
581           REPLACE ly WITH sly+0.1
582           *  SLY=SLY+0.1
583        CASE UPPER(idr)<>"Q"
584           IF ddr=" "
585              REPLACE ddr WITH idr
586           ENDIF
587           flx=00.0
588           @ 9,5 SAY "ENTER LAST X COORDINATE FOR DEMAND REGION &IDR >"  GET flx PICTU
588  RE "99.9"
589           READ
590           clx=slx
591           DO WHILE clx <= flx
592              APPEND Blank
593              REPLACE lx WITH clx
594              REPLACE ly WITH sly
595              REPLACE ddr WITH idr
596              clx=clx+0.1
597           ENDDO
598        ENDCASE
599     ENDDO
600     @ 5,0 CLEAR
601     @ 5,5 SAY "DO YOU WISH TO CONTINUE OR QUIT (C/Q) >" GET C
602     idr=" "
603     READ
604  ENDDO
605  RETURN
606  ************************************************************
607  *                          RP3                             *
608  ************************************************************
609  PROCEDURE rp3
610  *** REPORT CURRENTLY LIMITED TO 9 STATIONS
611  @ 7,0 CLEAR
612  @ 7,5 SAY "PROCESSING COMPANY STATISTICS REPORT - CURRENT"
613  USE &fn
614  SET UNIQUE ON
615  INDEX ON ricl TO INDEX
616  GO TOP
617  cnt=1
618  DO WHILE .NOT. EOF()
619     X=STR(cnt,1,0)
620     sc&x=ricl
621     cnt=cnt+1
622     SKIP
623  ENDDO
624  SET UNIQUE OFF
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
625  USE &fn
626  SET DEVICE TO PRINT
627  @ 2,33 SAY "**** ERAM - COMPANY STATISTICS REPORT FOR SCENERIO - &FN ****
628  @ 4,10 SAY "COMPANY"
629  @ 4,25 SAY "GEO-GRIDS"
630  @ 4,44 SAY "AV TR T"
631  @ 4,59 SAY "MAX TR T"
632  @ 4,74 SAY "STRUCTURAL"
633  @ 4,93 SAY "TOTAL ALARMS"
634  @ 5,10 SAY "DUE"
635  @ 5,25 SAY "1st"
636  @ 5,33 SAY "2nd"
637  @ 5,44 SAY "1st"
638  @ 5,50 SAY "2nd"
639  @ 5,59 SAY "1st"
640  @ 5,65 SAY "2nd"
641  @ 5,74 SAY "1st"
642  @ 5,82 SAY "2nd"
643  @ 5,93 SAY "1st"
644  @ 5,101 SAY "2nd"
645  @ 6,10 SAY "CURRENT"
646  SET DEVICE TO SCREEN
647  cnt=1
648  DO WHILE cnt<=cc
649     X=STR(cnt,1,0)
650     COUNT FOR r1ci=sc&x TO s1cc
651     COUNT FOR r2ci=sc&x TO s2cc
652     AVERAGE r1ct FOR r1ci=sc&x TO s1ct
653     AVERAGE r2ct FOR r2ci=sc&x TO s2ct
654     SUM isa,(isa+ioa) FOR r1ci=sc&x TO s1cs,s1ca
655     SUM isa,(isa+ioa) FOR r2ci=sc&x TO s2cs,s2ca
656     GO TOP
657     s1cm=0
658     s2cm=0
659     DO WHILE .NOT. EOF()
660        IF r1ci=sc&x
661           IF s1cm<r1ct
662              s1cm=r1ct
663           ENDIF
664           IF s2cm<r2ct
665              s2cm=r2ct
666           ENDIF
667        ENDIF
668        SKIP
669     ENDDO
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
670     SET DEVICE TO PRINT
671     @ PROW()+2,10 SAY sc&x
672     @ PROW(),25 SAY s1cc PICTURE "999999"
673     @ PROW(),33 SAY s2cc PICTURE "999999"
674     @ PROW(),44 SAY s1ct PICTURE "99.9"
675     @ PROW(),50 SAY s2ct PICTURE "99.9"
676     @ PROW(),59 SAY s1cm PICTURE "99.9"
677     @ PROW(),65 SAY s2cm PICTURE "99.9"
678     @ PROW(),74 SAY s1cs PICTURE "999999"
679     @ PROW(),82 SAY s2cs PICTURE "999999"
680     @ PROW(),93 SAY s1ca PICTURE "999999"
681     @ PROW(),101 SAY s2ca PICTURE "999999"
682     SET DEVICE TO SCREEN
683     cnt=cnt+1
684   ENDDO
685   EJECT
686   @ 7,0 CLEAR
687   @ 7,5 SAY "PROCESSING COMPANY STATISTICS REPORT - PROPOSED"
688   USE &fn
689   SET UNIQUE ON
690   INDEX ON r1pi TO INDEX
691   GO TOP
692   cnt=1
693   DO WHILE .NOT. EOF()
694     X=STR(cnt,1,0)
695     sc&x=r1pi
696     cnt=cnt+1
697     SKIP
698   ENDDO
699   SET UNIQUE OFF
700   USE &fn
701   SET DEVICE TO PRINT
702   @ 2,33 SAY "*** ERAM - COMPANY STATISTICS REPORT FOR SCENERIO - &FN ***"
703   @ 4,10 SAY "COMPANY"
704   @ 4,25 SAY "GEO-GRIDS"
705   @ 4,44 SAY "AV TR T"
706   @ 4,59 SAY "MAX TR T"
707   @ 4,74 SAY "STRUCTURAL"
708   @ 4,93 SAY "TOTAL ALARMS"
709   @ 5,10 SAY "DUE"
710   @ 5,25 SAY "1st"
711   @ 5,33 SAY "2nd"
712   @ 5,44 SAY "1st"
713   @ 5,50 SAY "2nd"
714   @ 5,59 SAY "1st"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
715  @ 5,65 SAY "2nd"
716  @ 5,74 SAY "1st"
717  @ 5,82 SAY "2nd"
718  @ 5,93 SAY "1st"
719  @ 5,101 SAY "2nd"
720  @ 6,10 SAY "PROPOSED"
721  SET DEVICE TO SCREEN
722  ent=1
723  DO WHILE ent<=cp
724     X=STR(ent,1,0)
725     COUNT FOR r1pi=sc&x TO s1pc
726     COUNT FOR r2pi=sc&x TO s2pc
727     AVERAGE r1pt FOR r1pi=sc&x TO s1pt
728     AVERAGE r2pt FOR r2pi=sc&x TO s2pt
729     SUM iss,(iss+ios) FOR r1pi=sc&x TO s1ps,s1pe
730     SUM iss,(iss+ios) FOR r2pi=sc&x TO s2ps,s2pe
731     GO TOP
732     s1pm=0
733     s2pm=0
734     DO WHILE .NOT. EOF()
735        IF r1pi=sc&x
736           IF s1pm<r1pt
737              s1pm=r1pt
738           ENDIF
739           IF s2pm<r2pt
740              s2pm=r2pt
741           ENDIF
742        ENDIF
743        SKIP
744     ENDDO
745     SET DEVICE TO PRINT
746     @ PROW()+2,10 SAY sc&x
747     @ PROW(),25 SAY s1pc PICTURE "999999"
748     @ PROW(),33 SAY s2pc PICTURE "999999"
749     @ PROW(),44 SAY s1pt PICTURE "99.9"
750     @ PROW(),50 SAY s2pt PICTURE "99.9"
751     @ PROW(),59 SAY s1pm PICTURE "99.9"
752     @ PROW(),65 SAY s2pm PICTURE "99.9"
753     @ PROW(),74 SAY s1ps PICTURE "999999"
754     @ PROW(),82 SAY s2ps PICTURE "999999"
755     @ PROW(),93 SAY s1pe PICTURE "999999"
756     @ PROW(),101 SAY s2pe PICTURE "999999"
757     SET DEVICE TO SCREEN
758     ent=ent+1
759  ENDDO
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
760  EJECT
761  RETURN
762  ************************************************************
763  *                          RP5                             *
764  ************************************************************
765  PROCEDURE rp5
766  t1cm=0
767  t1pm=0
768  @ 7,0 CLEAR
769  @ 7,5 SAY "PROCESSING TARGET HAZARD STATISTICS REPORT"
770  USE &fn
771  COUNT FOR UPPER(dth)="T" TO t1c
772  SUM isa,(isa+ioa) FOR UPPER(dth)="T" TO t1s,t1a
773  SUM r1ct*isa,r1ct*(ioa+isa),r1pt*isa,r1pt*(ioa+isa) FOR UPPER(dth)="T" TO t1csx,t1ct
773  x,t1psx,t1ptx
774  t1cs=t1csx/t1s
775  t1ca=t1ctx/t1a
776  t1ps=t1psx/t1s
777  t1pa=t1ptx/t1a
778  AVERAGE r1ct,r1pt FOR UPPER(dth)="T" TO t1ct,t1pt
779  GO TOP
780  DO WHILE .NOT. EOF()
781     IF UPPER(dth)="T"
782        IF t1cm<r1ct
783           t1cm=r1ct
784        ENDIF
785        IF t1pm<r1pt
786           t1pm=r1pt
787        ENDIF
788     ENDIF
789     SKIP
790  ENDDO
791  SET DEVICE TO PRINT
792  @ 1,30 SAY "*** ERAM - TARGET HAZARD STATISTICS REPORT FOR SCENERIO = &FN ***"
793  @ 3,25 SAY "1st DUE"
794  @ 4,25 SAY "CITYWIDE   > "
795  @ 4,50 SAY "GEO-GRIDS = "+STR(t1c,8,0)
796  @ 4,80 SAY "ALARMS = "+STR(t1a,8,0)
797  @ 4,100 SAY "STRUCTURAL ALARMS = "+STR(t1s,8,0)
798  @ 5,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
799  @ 5,80 SAY "CURRENT = "+STR(t1ct,8,2)
800  @ 5,100 SAY "PROPOSED = "+STR(t1pt,8,2)
801  @ 6,50 SAY "WEIGHTED - STRUCTURAL"
802  @ 6,80 SAY "CURRENT = "+STR(t1cs,8,2)
803  @ 6,100 SAY "PROPOSED = "+STR(t1ps,8,2)
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
804  @ 7,50 SAY "WEIGHTED - TOTAL ALARMS"
805  @ 7,80 SAY "CURRENT = "+STR(t1ca,8,2)
806  @ 7,100 SAY "PROPOSED = "+STR(t1pa,8,2)
807  @ 8,50 SAY "MAX TRAVEL TIME"
808  @ 8,80 SAY "CURRENT = "+STR(t1cm,8,2)
809  @ 8,100 SAY "PROPOSED = "+STR(t1pm,8,2)
810  SET DEVICE TO SCREEN
811  SET DELETED OFF
812  RECALL ALL
813  DELETE ALL FOR UPPER(dth)<>"T"
814  SET DELETED ON
815  GO TOP
816  SET DEVICE TO PRINT
817  @ PROW()+2,25 SAY "TRAVEL TIME TO TARGET LOCATIONS"
818  DO WHILE .NOT. EOF()
819     @ PROW()+2,50 SAY "LOCATION = "
820     @ PROW(),62 SAY ix
821     @ PROW(),67 SAY ","
822     @ PROW(),69 SAY iy
823     @ PROW(),80 SAY "CURRENT = "+STR(r1ct,8,2)
824     @ PROW(),100 SAY "PROPOSED = "+STR(r1pt,8,2)
825     SKIP
826  ENDDO
827  EJECT
828  SET DEVICE TO SCREEN
829  t2cm=0
830  t2pm=0
831  @ 7,0 CLEAR
832  @ 7,5 SAY "PROCESSING TARGET HAZARD STATISTICS REPORT"
833  USE &fn
834  COUNT FOR UPPER(dth)="T" TO t2c
835  SUM isa,(isa+ioa) FOR UPPER(dth)="T" TO t2s,t2a
836  SUM r2ct*isa,r2ct*(ioa+isa),r2pt*isa,r2pt*(ioa+isa) FOR UPPER(dth)="T" TO t2csx,t2ct
836  x,t2psx,t2ptx
837  t2cs=t2csx/t2s
838  t2ca=t2ctx/t2a
839  t2ps=t2psx/t2s
840  t2pa=t2ptx/t2a
841  AVERAGE r2ct,r2pt FOR UPPER(dth)="T" TO t2ct,t2pt
842  GO TOP
843  DO WHILE .NOT. EOF()
844     IF UPPER(dth)="T"
845        IF t2cm<r2ct
846           t2cm=r2ct
847        ENDIF
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
848         IF t2pm<r2pt
849            t2pm=r2pt
850         ENDIF
851      ENDIF
852      SKIP
853   ENDDO
854   SET DEVICE TO PRINT
855   @ 1,30 SAY "*** ERAM - TARGET HAZARD STATISTICS REPORT FOR SCENERIO = &FN ***"
856   @ 3,25 SAY "2nd DUE"
857   @ 4,25 SAY "CITYWIDE   > "
858   @ 4,50 SAY "GEO-GRIDS = "+STR(t2c,8,0)
859   @ 4,80 SAY "ALARMS = "+STR(t2a,8,0)
860   @ 4,100 SAY "STRUCTURAL ALARMS = "+STR(t2s,8,0)
861   @ 5,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
862   @ 5,80 SAY "CURRENT = "+STR(t2ct,8,2)
863   @ 5,100 SAY "PROPOSED = "+STR(t2pt,8,2)
864   @ 6,50 SAY "WEIGHTED - STRUCTURAL"
865   @ 6,80 SAY "CURRENT = "+STR(t2cs,8,2)
866   @ 6,100 SAY "PROPOSED = "+STR(t2ps,8,2)
867   @ 7,50 SAY "WEIGHTED - TOTAL ALARMS"
868   @ 7,80 SAY "CURRENT = "+STR(t2ca,8,2)
869   @ 7,100 SAY "PROPOSED = "+STR(t2pa,8,2)
870   @ 8,50 SAY "MAX TRAVEL TIME"
871   @ 8,80 SAY "CURRENT = "+STR(t2cm,8,2)
872   @ 8,100 SAY "PROPOSED = "+STR(t2pm,8,2)
873   SET DEVICE TO SCREEN
874   SET DELETED OFF
875   RECALL ALL
876   DELETE ALL FOR UPPER(dth)<>"T"
877   SET DELETED ON
878   GO TOP
879   SET DEVICE TO PRINT
880   @ PROW()+2,25 SAY "TRAVEL TIME TO TARGET LOCATIONS"
881   DO WHILE .NOT. EOF()
882      @ PROW()+2,50 SAY "LOCATION = "
883      @ PROW(),62 SAY lx
884      @ PROW(),67 SAY ","
885      @ PROW(),69 SAY ly
886      @ PROW(),80 SAY "CURRENT = "+STR(r2ct,8,2)
887      @ PROW(),100 SAY "PROPOSED = "+STR(r2pt,8,2)
888      SKIP
889   ENDDO
890   EJECT
891   SET DEVICE TO SCREEN
892   RETURN
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
893 ************************************************************
894 *                          RP2                             *
895 ************************************************************
896 PROCEDURE rp2
897 @ 7,0 CLEAR
898 @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT"
899 COUNT FOR rtct <=H TO cw1c0
900 COUNT FOR rtct >H .AND. rtct <= H*2 TO cw1c1
901 COUNT FOR rtct >H*2 .AND. rtct <= H*3 TO cw1c2
902 COUNT FOR rtct >H*3 .AND. rtct <= H*4 TO cw1c3
903 COUNT FOR rtct >H*4 .AND. rtct <= H*5 TO cw1c4
904 COUNT FOR rtct >H*5 .AND. rtct <= H*6 TO cw1c5
905 COUNT FOR rtct >H*6 .AND. rtct <= H*7 TO cw1c6
906 COUNT FOR rtct >H*7 .AND. rtct <= H*8 TO cw1c7
907 COUNT FOR rtct >H*8 .AND. rtct <= H*9 TO cw1c8
908 COUNT FOR rtct >H*9 .AND. rtct <= H*10 TO cw1c9
909 COUNT FOR rtct >H*10 TO cw1c10
910 SET DEVICE TO PRINT
911 @ 1,32 SAY "**** ERAM - DISTRIBUTION OF RESPONSE TIMES FOR SCENERIO - &FN ****"
912 @ 3,25 SAY "1st DUE"
913 @ 4,25 SAY "TRAVEL TIMES (MINUTES)"
914 @ 4,48 SAY STR(H*0,4,1)
915 @ 4,55 SAY STR(H*1,4,1)
916 @ 4,62 SAY STR(H*2,4,1)
917 @ 4,69 SAY STR(H*3,4,1)
918 @ 4,76 SAY STR(H*4,4,1)
919 @ 4,83 SAY STR(H*5,4,1)
920 @ 4,90 SAY STR(H*6,4,1)
921 @ 4,97 SAY STR(H*7,4,1)
922 @ 4,104 SAY STR(H*8,4,1)
923 @ 4,111 SAY STR(H*9,4,1)
924 @ 4,118 SAY ">"+STR(H*10,4,1)
925 @ 6,25 SAY "# OF GEO-GRIDS"
926 @ 7,25 SAY "CITYWIDE -CURRENT"
927 @ 7,50 SAY cw1c0 PICTURE "99999"
928 @ 7,57 SAY cw1c1 PICTURE "99999"
929 @ 7,64 SAY cw1c2 PICTURE "99999"
930 @ 7,71 SAY cw1c3 PICTURE "99999"
931 @ 7,78 SAY cw1c4 PICTURE "99999"
932 @ 7,85 SAY cw1c5 PICTURE "99999"
933 @ 7,92 SAY cw1c6 PICTURE "99999"
934 @ 7,99 SAY cw1c7 PICTURE "99999"
935 @ 7,106 SAY cw1c8 PICTURE "99999"
936 @ 7,113 SAY cw1c9 PICTURE "99999"
937 @ 7,120 SAY cw1c10 PICTURE "99999"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
938  SET DEVICE TO SCREEN
939  @ 7,0 CLEAR
940  @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT - PROPOSED"
941  COUNT FOR r1pt <=M TO cw1p0
942  COUNT FOR r1pt >M .AND. r1pt <= M*2 TO cw1p1
943  COUNT FOR r1pt >M*2 .AND. r1pt <= M*3 TO cw1p2
944  COUNT FOR r1pt >M*3 .AND. r1pt <= M*4 TO cw1p3
945  COUNT FOR r1pt >M*4 .AND. r1pt <= M*5 TO cw1p4
946  COUNT FOR r1pt >M*5 .AND. r1pt <= M*6 TO cw1p5
947  COUNT FOR r1pt >M*6 .AND. r1pt <= M*7 TO cw1p6
948  COUNT FOR r1pt >M*7 .AND. r1pt <= M*8 TO cw1p7
949  COUNT FOR r1pt >M*8 .AND. r1pt <= M*9 TO cw1p8
950  COUNT FOR r1pt >M*9 .AND. r1pt <= M*10 TO cw1p9
951  COUNT FOR r1pt >M*10 TO cw1p10
952  SET DEVICE TO PRINT
953  @ 8,25 SAY "          -PROPOSED"
954  @ 8,50 SAY cw1p0 PICTURE "99999"
955  @ 8,57 SAY cw1p1 PICTURE "99999"
956  @ 8,64 SAY cw1p2 PICTURE "99999"
957  @ 8,71 SAY cw1p3 PICTURE "99999"
958  @ 8,78 SAY cw1p4 PICTURE "99999"
959  @ 8,85 SAY cw1p5 PICTURE "99999"
960  @ 8,92 SAY cw1p6 PICTURE "99999"
961  @ 8,99 SAY cw1p7 PICTURE "99999"
962  @ 8,106 SAY cw1p8 PICTURE "99999"
963  @ 8,113 SAY cw1p9 PICTURE "99999"
964  @ 8,120 SAY cw1p10 PICTURE "99999"
965  SET DEVICE TO SCREEN
966  cnt=1
967  DO WHILE cnt<=cd
968     @ 7,0 CLEAR
969     @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT - CURRENT/REGIONAL"
970     COUNT FOR VAL(ddr)=cnt .AND. r1ct <=M TO cw1c0
971     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M .AND. r1ct <= M*2 TO cw1c1
972     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*2 .AND. r1ct <= M*3 TO cw1c2
973     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*3 .AND. r1ct <= M*4 TO cw1c3
974     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*4 .AND. r1ct <= M*5 TO cw1c4
975     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*5 .AND. r1ct <= M*6 TO cw1c5
976     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*6 .AND. r1ct <= M*7 TO cw1c6
977     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*7 .AND. r1ct <= M*8 TO cw1c7
978     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*8 .AND. r1ct <= M*9 TO cw1c8
979     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*9 .AND. r1ct <= M*10 TO cw1c9
980     COUNT FOR VAL(ddr)=cnt .AND. r1ct >M*10 TO cw1c10
981     SET DEVICE TO PRINT
982     scnt=STR(cnt,2,0)
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
 983     @ PROW()+2,25 SAY "REGION &SCNT - CURRENT"
 984     @ PROW(),50 SAY cw1c0 PICTURE "99999"
 985     @ PROW(),57 SAY cw1c1 PICTURE "99999"
 986     @ PROW(),64 SAY cw1c2 PICTURE "99999"
 987     @ PROW(),71 SAY cw1c3 PICTURE "99999"
 988     @ PROW(),78 SAY cw1c4 PICTURE "99999"
 989     @ PROW(),85 SAY cw1c5 PICTURE "99999"
 990     @ PROW(),92 SAY cw1c6 PICTURE "99999"
 991     @ PROW(),99 SAY cw1c7 PICTURE "99999"
 992     @ PROW(),106 SAY cw1c8 PICTURE "99999"
 993     @ PROW(),113 SAY cw1c9 PICTURE "99999"
 994     @ PROW(),120 SAY cw1c10 PICTURE "99999"
 995     SET DEVICE TO SCREEN
 996     @ 7,0 CLEAR
 997     @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT - PROPOSED"
 998     COUNT FOR VAL(ddr)=cnt .AND. r1pt <=N TO cw1p0
 999     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N .AND. r1pt <= N*2 TO cw1p1
1000     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*2 .AND. r1pt <= N*3 TO cw1p2
1001     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*3 .AND. r1pt <= N*4 TO cw1p3
1002     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*4 .AND. r1pt <= N*5 TO cw1p4
1003     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*5 .AND. r1pt <= N*6 TO cw1p5
1004     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*6 .AND. r1pt <= N*7 TO cw1p6
1005     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*7 .AND. r1pt <= N*8 TO cw1p7
1006     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*8 .AND. r1pt <= N*9 TO cw1p8
1007     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*9 .AND. r1pt <= N*10 TO cw1p9
1008     COUNT FOR VAL(ddr)=cnt .AND. r1pt >N*10 TO cw1p10
1009     SET DEVICE TO PRINT
1010     @ PROW()+1,25 SAY "          -PROPOSED"
1011     @ PROW(),50 SAY cw1p0 PICTURE "99999"
1012     @ PROW(),57 SAY cw1p1 PICTURE "99999"
1013     @ PROW(),64 SAY cw1p2 PICTURE "99999"
1014     @ PROW(),71 SAY cw1p3 PICTURE "99999"
1015     @ PROW(),78 SAY cw1p4 PICTURE "99999"
1016     @ PROW(),85 SAY cw1p5 PICTURE "99999"
1017     @ PROW(),92 SAY cw1p6 PICTURE "99999"
1018     @ PROW(),99 SAY cw1p7 PICTURE "99999"
1019     @ PROW(),106 SAY cw1p8 PICTURE "99999"
1020     @ PROW(),113 SAY cw1p9 PICTURE "99999"
1021     @ PROW(),120 SAY cw1p10 PICTURE "99999"
1022     SET DEVICE TO SCREEN
1023     cnt=cnt+1
1024  ENDDO
1025  EJECT
1026  SET DEVICE TO SCREEN
1027  @ 7,0 CLEAR
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1028  @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT"
1029  COUNT FOR r2ct <=M TO cw2c0
1030  COUNT FOR r2ct >M .AND. r2ct <= M*2 TO cw2c1
1031  COUNT FOR r2ct >M*2 .AND. r2ct <= M*3 TO cw2c2
1032  COUNT FOR r2ct >M*3 .AND. r2ct <= M*4 TO cw2c3
1033  COUNT FOR r2ct >M*4 .AND. r2ct <= M*5 TO cw2c4
1034  COUNT FOR r2ct >M*5 .AND. r2ct <= M*6 TO cw2c5
1035  COUNT FOR r2ct >M*6 .AND. r2ct <= M*7 TO cw2c6
1036  COUNT FOR r2ct >M*7 .AND. r2ct <= M*8 TO cw2c7
1037  COUNT FOR r2ct >M*8 .AND. r2ct <= M*9 TO cw2c8
1038  COUNT FOR r2ct >M*9 .AND. r2ct <= M*20 TO cw2c9
1039  COUNT FOR r2ct >M*10 TO cw2c10
1040  SET DEVICE TO PRINT
1041  @ 1,32 SAY "**** ERAM - DISTRIBUTION OF RESPONSE TIMES FOR SCENERIO - &FN ****"
1042  @ 3,25 SAY "2nd DUE"
1043  @ 4,25 SAY "TRAVEL TIMES (MINUTES)"
1044  @ 4,48 SAY STR(M*0,4,1)
1045  @ 4,55 SAY STR(M*1,4,1)
1046  @ 4,62 SAY STR(M*2,4,1)
1047  @ 4,69 SAY STR(M*3,4,1)
1048  @ 4,76 SAY STR(M*4,4,1)
1049  @ 4,83 SAY STR(M*5,4,1)
1050  @ 4,90 SAY STR(M*6,4,1)
1051  @ 4,97 SAY STR(M*7,4,1)
1052  @ 4,104 SAY STR(M*8,4,1)
1053  @ 4,111 SAY STR(M*9,4,1)
1054  @ 4,118 SAY ">"+STR(M*10,4,1)
1055  @ 6,25 SAY "# OF GEO-GRIDS"
1056  @ 7,25 SAY "CITYWIDE  -CURRENT"
1057  @ 7,50 SAY cw2c0 PICTURE "99999"
1058  @ 7,57 SAY cw2c1 PICTURE "99999"
1059  @ 7,64 SAY cw2c2 PICTURE "99999"
1060  @ 7,71 SAY cw2c3 PICTURE "99999"
1061  @ 7,78 SAY cw2c4 PICTURE "99999"
1062  @ 7,85 SAY cw2c5 PICTURE "99999"
1063  @ 7,92 SAY cw2c6 PICTURE "99999"
1064  @ 7,99 SAY cw2c7 PICTURE "99999"
1065  @ 7,106 SAY cw2c8 PICTURE "99999"
1066  @ 7,113 SAY cw2c9 PICTURE "99999"
1067  @ 7,120 SAY cw2c10 PICTURE "99999"
1068  SET DEVICE TO SCREEN
1069  @ 7,0 CLEAR
1070  @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT - PROPOSED"
1071  COUNT FOR r2pt <=M TO cw2p0
1072  COUNT FOR r2pt >M .AND. r2pt <= M*2 TO cw2p1
```

```
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1073  COUNT FOR r2pt >M*2 .AND. r2pt <= M*3 TO cw2p2
1074  COUNT FOR r2pt >M*3 .AND. r2pt <= M*4 TO cw2p3
1075  COUNT FOR r2pt >M*4 .AND. r2pt <= M*5 TO cw2p4
1076  COUNT FOR r2pt >M*5 .AND. r2pt <= M*6 TO cw2p5
1077  COUNT FOR r2pt >M*6 .AND. r2pt <= M*7 TO cw2p6
1078  COUNT FOR r2pt >M*7 .AND. r2pt <= M*8 TO cw2p7
1079  COUNT FOR r2pt >M*8 .AND. r2pt <= M*9 TO cw2p8
1080  COUNT FOR r2pt >M*9 .AND. r2pt <= M*10 TO cw2p9
1081  COUNT FOR r2pt >M*10 TO cw2p10
1082  SET DEVICE TO PRINT
1083  @ 8,25 SAY "          -PROPOSED"
1084  @ 8,50 SAY cw2p0 PICTURE "99999"
1085  @ 8,57 SAY cw2p1 PICTURE "99999"
1086  @ 8,64 SAY cw2p2 PICTURE "99999"
1087  @ 8,71 SAY cw2p3 PICTURE "99999"
1088  @ 8,78 SAY cw2p4 PICTURE "99999"
1089  @ 8,85 SAY cw2p5 PICTURE "99999"
1090  @ 8,92 SAY cw2p6 PICTURE "99999"
1091  @ 8,99 SAY cw2p7 PICTURE "99999"
1092  @ 8,106 SAY cw2p8 PICTURE "99999"
1093  @ 8,113 SAY cw2p9 PICTURE "99999"
1094  @ 8,120 SAY cw2p10 PICTURE "99999"
1095  SET DEVICE TO SCREEN
1096  cnt=1
1097  DO WHILE cnt<=cd
1098     @ 7,0 CLEAR
1099     @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT - CURRENT/REGIONAL"
1100     COUNT FOR VAL(ddr)=cnt .AND. r2ct <=M TO cw2c0
1101     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M .AND. r2ct <= M*2 TO cw2c1
1102     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*2 .AND. r2ct <= M*3 TO cw2c2
1103     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*3 .AND. r2ct <= M*4 TO cw2c3
1104     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*4 .AND. r2ct <= M*5 TO cw2c4
1105     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*5 .AND. r2ct <= M*6 TO cw2c5
1106     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*6 .AND. r2ct <= M*7 TO cw2c6
1107     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*7 .AND. r2ct <= M*8 TO cw2c7
1108     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*8 .AND. r2ct <= M*9 TO cw2c8
1109     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*9 .AND. r2ct <= M*10 TO cw2c9
1110     COUNT FOR VAL(ddr)=cnt .AND. r2ct >M*10 TO cw2c10
1111     SET DEVICE TO PRINT
1112     scnt=STR(cnt,2,0)
1113     @ PROW()+2,25 SAY "REGION &SCNT - CURRENT"
1114     @ PROW(),50 SAY cw2c0 PICTURE "99999"
1115     @ PROW(),57 SAY cw2c1 PICTURE "99999"
1116     @ PROW(),64 SAY cw2c2 PICTURE "99999"
1117     @ PROW(),71 SAY cw2c3 PICTURE "99999"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1118     @ PROW(),78 SAY cw2c4 PICTURE "99999"
1119     @ PROW(),85 SAY cw2c5 PICTURE "99999"
1120     @ PROW(),92 SAY cw2c6 PICTURE "99999"
1121     @ PROW(),99 SAY cw2c7 PICTURE "99999"
1122     @ PROW(),106 SAY cw2c8 PICTURE "99999"
1123     @ PROW(),113 SAY cw2c9 PICTURE "99999"
1124     @ PROW(),120 SAY cw2c10 PICTURE "99999"
1125     SET DEVICE TO SCREEN
1126     @ 7,0 CLEAR
1127     @ 7,5 SAY "PROCESSING DISTRIBUTION OF RESPONSE TIME REPORT - PROPOSED"
1128     COUNT FOR VAL(ddr)=ent .AND. r2pt <=H TO cw2p0
1129     COUNT FOR VAL(ddr)=ent .AND. r2pt >H .AND. r2pt <= H*2 TO cw2p1
1130     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*2 .AND. r2pt <= H*3 TO cw2p2
1131     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*3 .AND. r2pt <= H*4 TO cw2p3
1132     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*4 .AND. r2pt <= H*5 TO cw2p4
1133     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*5 .AND. r2pt <= H*6 TO cw2p5
1134     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*6 .AND. r2pt <= H*7 TO cw2p6
1135     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*7 .AND. r2pt <= H*8 TO cw2p7
1136     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*8 .AND. r2pt <= H*9 TO cw2p8
1137     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*9 .AND. r2pt <= H*10 TO cw2p9
1138     COUNT FOR VAL(ddr)=ent .AND. r2pt >H*10 TO cw2p10
1139     SET DEVICE TO PRINT
1140     @ PROW()+1,25 SAY "          -PROPOSED"
1141     @ PROW(),50 SAY cw2p0 PICTURE "99999"
1142     @ PROW(),57 SAY cw2p1 PICTURE "99999"
1143     @ PROW(),64 SAY cw2p2 PICTURE "99999"
1144     @ PROW(),71 SAY cw2p3 PICTURE "99999"
1145     @ PROW(),78 SAY cw2p4 PICTURE "99999"
1146     @ PROW(),85 SAY cw2p5 PICTURE "99999"
1147     @ PROW(),92 SAY cw2p6 PICTURE "99999"
1148     @ PROW(),99 SAY cw2p7 PICTURE "99999"
1149     @ PROW(),106 SAY cw2p8 PICTURE "99999"
1150     @ PROW(),113 SAY cw2p9 PICTURE "99999"
1151     @ PROW(),120 SAY cw2p10 PICTURE "99999"
1152     SET DEVICE TO SCREEN
1153     ent=ent+1
1154  ENDDO
1155  EJECT
1156  SET DEVICE TO SCREEN
1157  RETURN
1158  ************************************************************
1159  *                        TFD                               *
1160  ************************************************************
1161  PROCEDURE tfd
1162  mm=0
```

```
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1163  ss=0
1164  s=0
1165  tfd=0
1166  C=" "
1167  @ 2,19 SAY "*** TIME FACTORED DISTANCE WORKSHEET ***"
1168  DO WHILE UPPER(C)<>"Q"
1169     C=" "
1170     @ 5,0 CLEAR
1171     @ 5,5 SAY "ENTER TRAVEL TIME TO BE CONVERTED TO TIME FACTORED DISTANCE"
1172     @ 9,5 SAY "PLEASE SELECT  CONTINUE / QUIT  (C/Q) > "GET C
1173     READ
1174     IF UPPER(C)="Q"
1175        EXIT
1176     ENDIF
1177     mm=0
1178     ss=0
1179     @ 15,0 CLEAR
1180     @ 15,5 SAY "ENTER TIME IN MINUTES AND SECONDS  MM:SS OR '00:00' TO END >"
1181     @ 15,70 GET mm PICTURE "99"
1182     @ 15,73 SAY ":"
1183     @ 15,75 GET ss PICTURE "99"
1184     READ
1185     s=ss/60
1186     t=mm+s
1187     IF t=0
1188        EXIT
1189     ENDIF
1190     IF t <= 1.3
1191        tfd=(t/2.1)^2
1192     ELSE
1193        tfd=(t-.65)/1.7
1194     ENDIF
1195     @ 15,0 CLEAR
1196     @ 15,5 SAY "TIME FACTORED DISTANCE ="
1197     @ 15,35 SAY tfd PICTURE "99.9"
1198     WAIT
1199  ENDDO
1200  RETURN
1201  ************************************************************
1202  *                          INI                             *
1203  ************************************************************
1204  PROCEDURE ini
1205  DO WHILE UPPER(C)<>"Q"
1206     y=" "
1207     C=" "
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1208    CLEAR
1209    @ 2,25 SAY "**** INCIDENT DATA INPUT ****"
1210    @ 5,5 SAY "PLEASE ENTER YOUR SELECTION (C/M/Q) > "GET C
1211    @ 8,5 SAY "C - CREATE ACTIVE INCIDENT DATA FILE FOR INPUT"
1212    @ 10,5 SAY "M - MODIFY INCIDENT COUNTS IN EXISTING INCIDENT DATA FILE"
1213    @ 12,5 SAY "Q - QUIT"
1214    READ
1215    IF C<>"Q"
1216       @ 18,5 SAY "REMEMBER - DEMAND REGION DATA FILE MUST BE COMPLETE PRIOR"
1217       @ 19,5 SAY "TO INCIDENT DATA INPUT.  IS FILE COMPLETE? (Y/N) >"GET y
1218       READ
1219       IF UPPER(y)<>"Y"
1220          RETURN
1221       ENDIF
1222    ENDIF
1223    DO CASE
1224    CASE UPPER(C)="Q"
1225       RETURN
1226    CASE UPPER(C)="C"
1227       IF FILE("ERAM_CIF.DBF")
1228          85,5 CLEAR
1229          85,5 SAY "INCIDENT FILES ALREADY EXIST - CHOICE (MODIFY OR QUIT)"
1230          WAIT
1231       ELSE
1232          USE eram_d
1233          COPY STRU TO eram_cif
1234          USE eram_185
1235          APPEND FROM eram_d FIELDS lx,ly
1236          USE eram_186
1237          APPEND FROM eram_d FIELDS lx,ly
1238          USE eram_187
1239          APPEND FROM eram_d FIELDS lx,ly
1240          USE eram_188
1241          APPEND FROM eram_d FIELDS lx,ly
1242          USE eram_189
1243          APPEND FROM eram_d FIELDS lx,ly
1244          USE eram_190
1245          APPEND FROM eram_d FIELDS lx,ly
1246       ENDIF
1247    CASE UPPER(C)="M"
1248       lx=0
1249       fn=" "
1250       C=" "
1251       @ 5,0 CLEAR
1252       @ 5,5 SAY "ENTER YEAR WHICH DATA REPRESENTS (85/86/87/88/89/90) >"GET fn
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1253        @ 7,5 SAY "REMEMBER - ENTER INCIDENT DATA INTO APPROPRIATE YEAR'S DATA FILE"
1254        READ
1255        USE eram_i&fn
1256        INDEX ON STR(lx,4,1)+STR(ly,4,1) TO INDEX
1257        DO WHILE lx<>99.9
1258           SET STATUS ON
1259           sx=0
1260           sy=0
1261           @ 2,25 SAY "**** INCIDENT DATA INPUT ****"
1262           @ 5,0 CLEAR TO 21,80
1263           @ 5,5 SAY "COORDINATE VALUES OF 99.9 = QUIT"
1264           @ 7,5 SAY "ENTER X COORDINATE OF INCIDENT (##.#) >" GET sx PICTURE '##.#'
1265           @ 9,5 SAY "ENTER Y COORDINATE OF INCIDENT (##.#) >" GET sy PICTURE '##.#'
1266           READ
1267           IF sx=99.9
1268              EXIT
1269           ENDIF
1270           SEEK STR(sx,4,1)+STR(sy,4,1)
1271           IF FOUND()
1272              SET CONFIRM ON
1273              SET FORMAT TO ini
1274              EDIT
1275              SET CONFIRM OFF
1276              SET FORMAT TO
1277              CLEAR
1278              @ 2,25 SAY "**** INCIDENT DATA INPUT ****"
1279              IF EOF() .OR. BOF()
1280                 GO TOP
1281                 @ 5,5 SAY "YOUR LAST PAGE PLACED YOU OUT OF DATA BASE RANGE."
1282                 @ 7,5 SAY "PROCEED WITH ANOTHER COORDINATE SELECTION"
1283                 @ 9,5 SAY " "
1284                 WAIT
1285                 sx=0
1286                 sy=0
1287              ENDIF
1288           ELSE
1289              @ 5,0 CLEAR
1290              @ 5,5 SAY "COORDINATE POINT ("+STR(sx,4,1)+","+STR(sy,4,1)+") IS NOT"
1291              @ 7,5 SAY "ON THE DISTRICT LIST.  PLEASE CHECK COORDINATES AND REENTER"
1292              @ 9,5 SAY " "
1293              WAIT
1294           ENDIF
1295           SET STATUS OFF
1296        ENDDO
1297     ENDCASE
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1298 ENDDO
1299 RETURN
1300 ************************************************************
1301 *                          INS                             *
1302 ************************************************************
1303 PROCEDURE ins
1304 E=".DBF"
1305 y=" "
1306 F=" "
1307 fs="       "
1308 C=" "
1309 m="N"
1310 CLEAR
1311 @ 2,27 SAY "**** STATION DATA INPUT ****"
1312 fs="       "
1313 @ 5,0 CLEAR
1314 @ 5,5 SAY "ENTER STATION DATABASE >" GET fs
1315 @ 7,5 SAY "FILENAME EXAMPLE - E025040"
1316 READ
1317 IF FILE("&FS&E")
1318    f="T"
1319 ELSE
1320    @ 9,5 SAY "THIS IS A NEW FILENAME - ONLY OPTIONS 'C/Q' ON NEXT MENU ARE VALID"
1321    f="F"
1322    WAIT
1323 ENDIF
1324 DO WHILE UPPER(C)<>"Q"
1325    C=" "
1326    @ 7,0 CLEAR
1327    @ 7,5 SAY "PLEASE ENTER YOUR SELECTION (C/E/U/Q) >" GET C
1328    @ 9,5 SAY "C - CREATE A STATION DATABASE"
1329    @ 11,5 SAY "E - EDIT THE STATION RESPONSE MATRIX"
1330    @ 13,5 SAY "U - UPDATE STATION ACCESS REGION DATABASE "
1331    @ 15,5 SAY "Q - QUIT"
1332    READ
1333    IF UPPER(F)="F" .AND. UPPER(C)<>"C"
1334       RETURN
1335    ENDIF
1336    DO CASE
1337    CASE UPPER(C)="Q"
1338       RETURN
1339    CASE UPPER(C)="C"
1340       @ 7,0 CLEAR
1341       @ 7,5 SAY "NOTE: THE DEMAND REGION DATA FILE MUST BE COMPLETE PRIOR TO"
1342       @ 9,5 SAY "      RUNNING THE STATION UPDATE PROGRAM"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1343        @ 11,5 SAY "IS THIS FILE COMPLETE (Y/N) >" GET y
1344        READ
1345        IF UPPER(y)<>"Y"
1346           y=" "
1347           C=" "
1348           RETURN
1349        ENDIF
1350        IF FILE("&FS&E")
1351           @ 7,0 CLEAR
1352           @ 7,5 SAY "FILE &FS ALREADY EXISTS"
1353           WAIT
1354        ELSE
1355           USE eram_m
1356           COPY STRU TO &fs&m
1357           USE eram_s
1358           COPY STRU TO &fs
1359           USE &fs
1360           APPEND FROM eram_d FIELDS lx,ly
1361           @ 7,0 CLEAR
1362           @ 7,5 SAY "FILE &FS HAS BEEN CREATED"
1363           WAIT
1364        ENDIF
1365        f="T"
1366     CASE UPPER(C)="E"
1367        USE &fs&m
1368        SET FORMAT TO sdi
1369        SET CONFIRM ON
1370        SET MENU ON
1371        SET STATUS ON
1372        APPEND
1373        SET FORMAT TO
1374        SET CONFIRM OFF
1375        SET MENU OFF
1376        SET STATUS OFF
1377        DELETE ALL FOR mdt=" "
1378        PACK
1379        CLEAR
1380        @ 2,27 SAY "*** STATION DATA INPUT ***"
1381        @ 5,5 SAY "ENTER STATION DATABASE > &FS"
1382        IF EOF() .OR. BOF()
1383           GO TOP
1384           @ 7,5 SAY "YOUR LAST PAGE PLACED YOU OUT OF DATABASE RANGE"
1385           @ 9,5 SAY "PROCEED WITH ANOTHER SELECTION"
1386           WAIT
1387        ENDIF
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1388    CASE UPPER(C)="U"
1389       USE &fs
1390       @ 7,0 CLEAR
1391       @ 7,5 SAY "NOTE: BOTH THE DEMAND REGION DATA FILE & THE STATION MATRIX FOR"
1392       @ 9,5 SAY "   MUST BE COMPLETE PRIOR TO RUNNING THE STATION UPDATE PROGRAM"
1393       @ 11,5 SAY "ARE BOTH OF THESE FILES COMPLETE (Y/N) >" GET y
1394       READ
1395       IF UPPER(y)<>"Y"
1396          y=" "
1397          C=" "
1398          RETURN
1399       ENDIF
1400       DO WHILE UPPER(y)<>"Q"
1401          y=" "
1402          @ 7,0 CLEAR
1403          @ 7,5 SAY "PLEASE ENTER YOUR SELECTION (A/Q) " GET y
1404          @ 9,5 SAY "A - ACCESS REGION DATA INPUT"
1405          @ 11,5 SAY "Q - QUIT"
1406          READ
1407          DO CASE
1408          CASE UPPER(y)="Q"
1409             y=" "
1410             EXIT
1411          CASE UPPER(y)="A"
1412             USE &fs
1413             SET DELETED OFF
1414             RECALL ALL
1415             INDEX ON STR(iy,4,1)+STR(ix,4,1) TO INDEX
1416             DELETE ALL FOR sar<>" "
1417             SET DELETED ON
1418             GO BOTT
1419             IF EOF()
1420                @ 7,0 CLEAR
1421                @ 7,5 SAY "ACCESS REGION DATA COMPLETE"
1422                @ 9,5 SAY " "
1423                SET DELETED OFF
1424                RECALL ALL
1425                WAIT
1426                EXIT
1427             ENDIF
1428             GO TOP
1429             C=" "
1430             y=" "
1431             CLEAR
1432             @ 2,24 SAY "**** ACCESS REGION DATA INPUT ****"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1433            DO WHILE UPPER(y)<>"Q"
1434               sly=ly
1435               DO WHILE sly=ly
1436                  C=" "
1437                  @ 7,0 CLEAR
1438                  @ 7,5 SAY "STATION > &FS"
1439                  @ 9,5 SAY "START COORDINATE IS >  "+STR(lx,4,1)+" , "+STR(ly,4,1)
1440                  @ 11,5 SAY "ENTER ACCESS REGION ID  OR  QUIT  (ID/Q) >" GET C
1441                  @ 13,5 SAY "ACCESS ID CHOICES - 'A - J' WHERE 'A' IS"
1442                  @ 15,5 SAY " ALWAYS THE ACCESS REGION OF THE STATION"
1443                  @ 17,5 SAY "Q - QUIT"
1444                  READ
1445                  IF UPPER(C)="Q"
1446                     SET DELETED OFF
1447                     RECALL ALL
1448                     C=" "
1449                     y=" "
1450                     RETURN
1451                  ENDIF
1452                  flx=00.0
1453                  @ 11,0 CLEAR
1454               ✓  @ 11,5 SAY "ENTER LAST X COORDINATE FOR ACCESS REGION &C >"GET flx
1454  PICTURE "99.9"
1455                  READ
1456                  DO WHILE lx<=flx .AND. sly=ly
1457                     REPLACE sar WITH C
1458                     SKIP
1459                     IF EOF()
1460                        @ 11,0 CLEAR
1461                        @ 11,5 SAY "ACCESS REGION DATA INPUT IS COMPLETE"
1462                        SET DELETED OFF
1463                        RECALL ALL
1464                        y=" "
1465                        C=" "
1466                        WAIT
1467                        RETURN
1468                     ENDIF
1469                  ENDDO
1470                  @ 7,0 CLEAR
1471                  @ 7,5 SAY "PLEASE ENTER YOUR SELECTION (C/Q) >" GET y
1472                  @ 9,5 SAY "C - CONTINUE"
1473                  @ 11,5 SAY "Q - QUIT"
1474                  READ
1475                  sly=ly
1476               ENDDO
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1477                SET DELETED OFF
1478                RECALL ALL
1479                y=" "
1480                C=" "
1481             ENDDO
1482             GO TOP
1483          ENDCASE
1484       ENDDO
1485    ENDCASE
1486 ENDDO
1487 RETURN
1488 ************************************************************
1489 *                          INSCALC                         *
1490 ************************************************************
1491 PROCEDURE inscalc
1492 R=" "
1493 D=0
1494 mlx=00.0
1495 mly=00.0
1496 dt=" "
1497 USE &fs&m
1498 SELECT 2
1499 USE &fs
1500 SELECT 1
1501 @ 7,0 CLEAR
1502 @ 7,5 SAY "PROCESSING STATION RESPONSE TIMES ... PLEASE WAIT"
1503 DO WHILE .NOT. EOF()
1504    R=mid
1505    D=mld
1506    mlx=lx
1507    mly=ly
1508    dt=mdt
1509    SELECT 2
1510    IF UPPER(dt)="A"
1511       REPLACE ALL sld WITH (D+ABS(mlx-lx)+ABS(mly-ly)) FOR sar=R
1512    ELSE
1513       REPLACE ALL sld WITH (D+(SQRT(((mlx-lx)^2)+((mly-ly)^2)))) FOR sar=R
1514    ENDIF
1515    SELECT 1
1516    SKIP
1517 ENDDO
1518 CLOSE ALL DATABASES
1519 USE &fs
1520 REPLACE ALL slt WITH (2.1*SQRT(sld)) FOR sld<=0.38
1521 REPLACE ALL slt WITH (0.65+(1.7*sld)) FOR sld>0.38
```

```
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1522  GO TOP
1523  @ 7,0 CLEAR
1524  @ 7,5 SAY "PROCESSING COMPLETE"
1525  @ 9,5 SAY " "
1526  WAIT
1527  RETURN
1528  ************************************************************
1529  *                          INL                             *
1530  ************************************************************
1531  PROCEDURE inl
1532  DO WHILE UPPER(C)<>"Q"
1533     y=" "
1534     C=" "
1535     CLEAR
1536     @ 2,25 SAY "*** LOCATION DATA INPUT ***"
1537     @ 5,5 SAY "PLEASE ENTER YOUR SELECTION (C/M/L/Q) > "GET C
1538     @ 8,5 SAY "C - CREATE ACTIVE LOCATION DATA FILE FOR INPUT"
1539     @ 10,5 SAY "M - MODIFY INFORMATION IN EXISTING LOCATION DATA FILE"
1540     @ 12,5 SAY "L - LIST LOCATIONS WITH A DESCRIPTION TO PRINTER"
1541     @ 14,5 SAY "Q - QUIT"
1542     READ
1543     IF C<>"Q"
1544        @ 18,5 SAY "REMEMBER - DEMAND REGION DATA FILE MUST BE COMPLETE PRIOR"
1545        @ 19,5 SAY "TO LOCATION DATA INPUT.  IS FILE COMPLETE? (Y/N) >"GET y
1546        READ
1547        IF UPPER(y)<>"Y"
1548           RETURN
1549        ENDIF
1550     ENDIF
1551     DO CASE
1552     CASE UPPER(C)="Q"
1553        RETURN
1554     CASE UPPER(C)="L"
1555        USE eram_l
1556        LIST ALL FOR ldesc<>"          " TO PRINT
1557        EJECT
1558     CASE UPPER(C)="C"
1559        IF FILE("ERAM_LIF.DBF")
1560           @5,5 CLEAR
1561           @5,5 SAY "INCIDENT FILES ALREADY EXIST - CHOICE (MODIFY OR QUIT)"
1562           WAIT
1563        ELSE
1564           USE eram_d
1565           COPY STRU TO eram_lif
1566           USE eram_l
```

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```
1567          APPEND FROM eram_d FIELDS lx,ly
1568       ENDIF
1569    CASE UPPER(C)="M"
1570       lx=0
1571       fm=" "
1572       C=" "
1573       USE eram_l
1574       INDEX ON STR(lx,4,1)+STR(ly,4,1) TO INDEX
1575       DO WHILE lx<>99.9
1576          SET STATUS ON
1577          sx=0
1578          sy=0
1579          @ 2,25 SAY "**** LOCATION DATA INPUT ****"
1580          @ 5,0 CLEAR TO 21,80
1581          @ 5,5 SAY "COORDINATE VALUES OF 99.9 = QUIT"
1582          @ 7,5 SAY "ENTER X COORDINATE OF LOCATION (##.#) >" GET sx PICTURE '##.#'
1583          @ 9,5 SAY "ENTER Y COORDINATE OF LOCATION (##.#) >" GET sy PICTURE '##.#'
1584          READ
1585          IF sx=99.9
1586             EXIT
1587          ENDIF
1588          SEEK STR(sx,4,1)+STR(sy,4,1)
1589          IF FOUND()
1590             SET CONFIRM ON
1591             SET FORMAT TO inl
1592             EDIT
1593             SET CONFIRM OFF
1594             SET FORMAT TO
1595             CLEAR
1596             @ 2,25 SAY "**** LOCATION DATA INPUT ****"
1597             IF EOF() .OR. BOF()
1598                GO TOP
1599                @ 5,5 SAY "YOUR LAST PAGE PLACED YOU OUT OF DATA BASE RANGE."
1600                @ 7,5 SAY "PROCEED WITH ANOTHER COORDINATE SELECTION"
1601                @ 9,5 SAY " "
1602                WAIT
1603                sx=0
1604                sy=0
1605             ENDIF
1606          ELSE
1607             @ 5,0 CLEAR
1608             @ 5,5 SAY "COORDINATE POINT ("+STR(sx,4,1)+","+STR(sy,4,1)+") IS NOT"
1609             @ 7,5 SAY "ON THE DISTRICT LIST.  PLEASE CHECK COORDINATES AND REENTER"
1610             @ 9,5 SAY " "
1611             WAIT
```

```
1612          ENDIF
1613          SET STATUS OFF
1614       ENDDO
1615    ENDCASE
1616 ENDDO
1617 RETURN
1618 ************************************************************
1619 *                          RP1                             *
1620 ************************************************************
1621 PROCEDURE rp1
1622 @ 7,0 CLEAR
1623 @ 7,5 SAY "PROCESSING DEMAND REGION STATISTICS REPORT"
1624 r1cm=0
1625 r1pm=0
1626 COUNT TO cwb
1627 SUM isa,(isa+ioa) TO cws,cwa
1628 SUM r1ct*isa,r1ct*(ioa+isa),r1pt*isa,r1pt*(ioa+isa) TO cw1csx,cw1ctx,cw1psx,cw1ptx
1629 cw1cs=cw1csx/cws
1630 cw1ct=cw1ctx/cwa
1631 cw1ps=cw1psx/cws
1632 cw1pt=cw1ptx/cwa
1633 AVERAGE r1ct,r1pt TO cw1c,cw1p
1634 GO TOP
1635 DO WHILE .NOT. EOF()
1636    IF r1cm < r1ct
1637       r1cm = r1ct
1638    ENDIF
1639    IF r1pm < r1pt
1640       r1pm = r1pt
1641    ENDIF
1642    SKIP
1643 ENDDO
1644 SET DEVICE TO PRINT
1645 @ 1,32 SAY "**** ERAM - DEMAND REGION STATISTICS REPORT FOR SCENERIO - &FN ****"
1646 @ 3,25 SAY "1st DUE"
1647 @ 4,25 SAY "CITYWIDE   > "
1648 @ 4,50 SAY "GEO-GRIDS = "+STR(cwb,8,0)
1649 @ 4,80 SAY "ALARMS = "+STR(cwa,8,0)
1650 @ 4,100 SAY "STRUCTURAL ALARMS = "+STR(cws,8,0)
1651 @ 5,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
1652 @ 5,80 SAY "CURRENT = "+STR(cw1c,8,2)
1653 @ 5,100 SAY "PROPOSED = "+STR(cw1p,8,2)
1654 @ 6,50 SAY "WEIGHTED - STRUCTURAL"
1655 @ 6,80 SAY "CURRENT = "+STR(cw1cs,8,2)
1656 @ 6,100 SAY "PROPOSED = "+STR(cw1ps,8,2)
```

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1657  @ 7,50 SAY "WEIGHTED - TOTAL ALARMS"
1658  @ 7,80 SAY "CURRENT = "+STR(cw1ct,8,2)
1659  @ 7,100 SAY "PROPOSED = "+STR(cw1pt,8,2)
1660  @ 8,50 SAY "MAX TRAVEL TIME"
1661  @ 8,80 SAY "CURRENT = "+STR(r1cm,8,2)
1662  @ 8,100 SAY "PROPOSED = "+STR(r1pm,8,2)
1663  cnt=1
1664  DO WHILE cnt<=cd
1665     r1cm=0
1666     r1pm=0
1667     COUNT FOR VAL(ddr)=cnt TO cub
1668     SUM isa,(isa+ioa) FOR VAL(ddr)=cnt TO cws,cwa
1669     SUM r1ct*isa,r1ct*(ioa+isa),r1pt*isa,r1pt*(ioa+isa) FOR VAL(ddr)=cnt TO cw1csx,cw
1669  1ctx,cw1psx,cw1ptx
1670     cw1cs=cw1csx/cws
1671     cw1ct=cw1ctx/cwa
1672     cw1ps=cw1psx/cws
1673     cw1pt=cw1ptx/cwa
1674     AVERAGE r1ct,r1pt FOR VAL(ddr)=cnt TO cw1c,cw1p
1675     GO TOP
1676     DO WHILE .NOT. EOF()
1677        IF VAL(ddr)=cnt
1678           IF r1cm < r1ct
1679              r1cm = r1ct
1680           ENDIF
1681           IF r1pm < r1pt
1682              r1pm = r1pt
1683           ENDIF
1684        ENDIF
1685        SKIP
1686     ENDDO
1687     scnt=STR(cnt,2,0)
1688     @ PROW()+2,25 SAY "REGION &SCNT   > "
1689     @ PROW(),50 SAY "GEO-GRIDS = "+STR(cub,8,0)
1690     @ PROW(),80 SAY "ALARMS = "+STR(cwa,8,0)
1691     @ PROW(),100 SAY "STRUCTURAL ALARMS = "+STR(cws,8,0)
1692     @ PROW()+1,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
1693     @ PROW(),80 SAY "CURRENT = "+STR(cw1c,8,2)
1694     @ PROW(),100 SAY "PROPOSED = "+STR(cw1p,8,2)
1695     @ PROW()+1,50 SAY "WEIGHTED - STRUCTURAL"
1696     @ PROW(),80 SAY "CURRENT = "+STR(cw1cs,8,2)
1697     @ PROW(),100 SAY "PROPOSED = "+STR(cw1ps,8,2)
1698     @ PROW()+1,50 SAY "WEIGHTED - TOTAL ALARMS"
1699     @ PROW(),80 SAY "CURRENT = "+STR(cw1ct,8,2)
1700     @ PROW(),100 SAY "PROPOSED = "+STR(cw1pt,8,2)
```

```
1701     @ PROW()+1,50 SAY "MAX TRAVEL TIME"
1702     @ PROW(),80 SAY "CURRENT = "+STR(r1cm,8,2)
1703     @ PROW(),100 SAY "PROPOSED = "+STR(r1pm,8,2)
1704     cnt=cnt+1
1705  ENDDO
1706  EJECT
1707  SET DEVICE TO SCREEN
1708  r2cm=0
1709  r2pm=0
1710  COUNT TO cwb
1711  SUM isa,(isa+ioa) TO cws,cwa
1712  SUM r2ct*isa,r2ct*(ioa+isa),r2pt*isa,r2pt*(ioa+isa) TO cw2csx,cw2ctx,cw2psx,cw2ptx
1713  cw2cs=cw2csx/cws
1714  cw2ct=cw2ctx/cwa
1715  cw2ps=cw2psx/cws
1716  cw2pt=cw2ptx/cwa
1717  AVERAGE r2ct,r2pt TO cw2c,cw2p
1718  GO TOP
1719  DO WHILE .NOT. EOF()
1720     IF r2cm < r2ct
1721        r2cm = r2ct
1722     ENDIF
1723     IF r2pm < r2pt
1724        r2pm = r2pt
1725     ENDIF
1726     SKIP
1727  ENDDO
1728  SET DEVICE TO PRINT
1729  @ 1,32 SAY "**** ERAM - DEMAND REGION STATISTICS REPORT FOR SCENERIO - &FN ****"
1730  @ 3,25 SAY "2nd DUE"
1731  @ 4,25 SAY "CITYWIDE   > "
1732  @ 4,50 SAY "GEO-GRIDS = "+STR(cwb,8,0)
1733  @ 4,80 SAY "ALARMS = "+STR(cwa,8,0)
1734  @ 4,100 SAY "STRUCTURAL ALARMS = "+STR(cws,8,0)
1735  @ 5,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
1736  @ 5,80 SAY "CURRENT = "+STR(cw2c,8,2)
1737  @ 5,100 SAY "PROPOSED = "+STR(cw2p,8,2)
1738  @ 6,50 SAY "WEIGHTED - STRUCTURAL"
1739  @ 6,80 SAY "CURRENT = "+STR(cw2cs,8,2)
1740  @ 6,100 SAY "PROPOSED = "+STR(cw2ps,8,2)
1741  @ 7,50 SAY "WEIGHTED - TOTAL ALARMS"
1742  @ 7,80 SAY "CURRENT = "+STR(cw2ct,8,2)
1743  @ 7,100 SAY "PROPOSED = "+STR(cw2pt,8,2)
1744  @ 8,50 SAY "MAX TRAVEL TIME"
1745  @ 8,80 SAY "CURRENT = "+STR(r2cm,8,2)
```

```
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1746  @ 8,100 SAY "PROPOSED = "+STR(r2pm,8,2)
1747  cnt=1
1748  DO WHILE cnt<=ccd
1749     r2cm=0
1750     r2pm=0
1751     COUNT FOR VAL(ddr)=cnt TO cub
1752     SUM isa,(isa+ioa) FOR VAL(ddr)=cnt TO cus,cua
1753     SUM r2ct*isa,r2ct*(ioa+isa),r2pt*isa,r2pt*(ioa+isa) FOR VAL(ddr)=cnt TO cu2csx,cu
1753  2ctx,cu2psx,cu2ptx
1754     cu2cs=cu2csx/cus
1755     cu2ct=cu2ctx/cua
1756     cu2ps=cu2psx/cus
1757     cu2pt=cu2ptx/cua
1758     AVERAGE r2ct,r2pt FOR VAL(ddr)=cnt TO cu2c,cu2p
1759     GO TOP
1760     DO WHILE .NOT. EOF()
1761        IF VAL(ddr)=cnt
1762           IF r2cm < r2ct
1763              r2cm = r2ct
1764           ENDIF
1765           IF r2pm < r2pt
1766              r2pm = r2pt
1767           ENDIF
1768        ENDIF
1769        SKIP
1770     ENDDO
1771     scnt=STR(cnt,2,0)
1772     @ PROW()+2,25 SAY "REGION &SCNT   > "
1773     @ PROW(),50 SAY "GEO-GRIDS = "+STR(cub,8,0)
1774     @ PROW(),80 SAY "ALARMS = "+STR(cua,8,0)
1775     @ PROW(),100 SAY "STRUCTURAL ALARMS = "+STR(cus,8,0)
1776     @ PROW()+1,50 SAY "AVERAGE TRAVEL TIME (MINUTES)"
1777     @ PROW(),80 SAY "CURRENT = "+STR(cu2c,8,2)
1778     @ PROW(),100 SAY "PROPOSED = "+STR(cu2p,8,2)
1779     @ PROW()+1,50 SAY "WEIGHTED - STRUCTURAL"
1780     @ PROW(),80 SAY "CURRENT = "+STR(cu2cs,8,2)
1781     @ PROW(),100 SAY "PROPOSED = "+STR(cu2ps,8,2)
1782     @ PROW()+1,50 SAY "WEIGHTED - TOTAL ALARMS"
1783     @ PROW(),80 SAY "CURRENT = "+STR(cu2ct,8,2)
1784     @ PROW(),100 SAY "PROPOSED = "+STR(cu2pt,8,2)
1785     @ PROW()+1,50 SAY "MAX TRAVEL TIME"
1786     @ PROW(),80 SAY "CURRENT = "+STR(r2cm,8,2)
1787     @ PROW(),100 SAY "PROPOSED = "+STR(r2pm,8,2)
1788     cnt=cnt+1
1789  ENDDO
```

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1790  EJECT
1791  SET DEVICE TO SCREEN
1792  RETURN
1793  ************************************************************
1794  *                          INT                             *
1795  ************************************************************
1796  PROCEDURE INT
1797  DO WHILE UPPER(C)<>"Q"
1798     y=" "
1799     C=" "
1800     CLEAR
1801     @ 2,25 SAY "**** TARGET HAZARD INPUT ****"
1802     @ 5,5 SAY "PLEASE ENTER YOUR SELECTION (M/Q) > "GET C
1803     @ 8,5 SAY "M - MODIFY TARGET STATUS IN EXISTING TARGET HAZARD FILE"
1804     @ 10,5 SAY "Q - QUIT"
1805     READ
1806     IF C<>"Q"
1807        @ 18,5 SAY "REMEMBER - DEMAND REGION DATA FILE MUST BE COMPLETE PRIOR"
1808        @ 19,5 SAY "TO TARGET HAZARD INPUT.  IS FILE COMPLETE? (Y/N) >"GET y
1809        READ
1810        IF UPPER(y)<>"Y"
1811           RETURN
1812        ENDIF
1813     ENDIF
1814     DO CASE
1815     CASE UPPER(C)="Q"
1816        RETURN
1817     CASE UPPER(C)="M"
1818        lx=0
1819        fn=" "
1820        C=" "
1821        @ 5,0 CLEAR
1822        USE eram_d
1823        INDEX ON STR(lx,4,1)+STR(ly,4,1) TO INDEX
1824        DO WHILE lx<>99.9
1825           SET STATUS ON
1826           sx=0
1827           sy=0
1828           @ 2,25 SAY "**** TARGET HAZARD INPUT ****"
1829           @ 5,0 CLEAR TO 21,80
1830           @ 5,5 SAY "COORDINATE VALUES OF 99.9 = QUIT"
1831           @ 7,5 SAY "ENTER X COORDINATE OF TARGET (##.#) >" GET sx PICTURE '##.#'
1832           @ 9,5 SAY "ENTER Y COORDINATE OF TARGET (##.#) >" GET sy PICTURE '##.#'
1833           READ
1834           IF sx=99.9
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1835            EXIT
1836         ENDIF
1837         SEEK STR(sx,4,1)+STR(sy,4,1)
1838         IF FOUND()
1839            SET CONFIRM ON
1840            SET FORMAT TO INT
1841            EDIT
1842            SET CONFIRM OFF
1843            SET FORMAT TO
1844            CLEAR
1845            @ 2,25 SAY "*** TARGET HAZARD INPUT ***"
1846            IF EOF() .OR. BOF()
1847               GO TOP
1848               @ 5,5 SAY "YOUR LAST PAGE PLACED YOU OUT OF DATA BASE RANGE."
1849               @ 7,5 SAY "PROCEED WITH ANOTHER COORDINATE SELECTION"
1850               @ 9,5 SAY " "
1851               WAIT
1852               sx=0
1853               sy=0
1854            ENDIF
1855         ELSE
1856            @ 5,0 CLEAR
1857            @ 5,5 SAY "COORDINATE POINT ("+STR(sx,4,1)+","+STR(sy,4,1)+") IS NOT"
1858            @ 7,5 SAY "ON THE DISTRICT LIST.  PLEASE CHECK COORDINATES AND REENTER"
1859            @ 9,5 SAY " "
1860            WAIT
1861         ENDIF
1862         SET STATUS OFF
1863      ENDDO
1864   ENDCASE
1865 ENDDO
1866 RETURN
1867 ************************************************************
1868 *                          QU                              *
1869 ************************************************************
1870 PROCEDURE qu
1871 CLEAR
1872 @ 2,31 SAY "*** EXIT MENU ***"
1873 @ 5,5 SAY "DO YOU WISH TO QUIT OR CONTINUE (C/Q) > " GET C
1874 @ 8,5 SAY "C - CONTINUE"
1875 @ 10,5 SAY "Q - QUIT"
1876 READ
1877 IF UPPER(C)="Q"
1878    @ 5,0 CLEAR
1879    @ 8,30 SAY "THANK-YOU FOR USING"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
1880    @ 10,32 SAY "***  ERAM  ***"
1881  ENDIF
1882  @ 18,5 SAY " "
1883  WAIT
1884  RETURN
1885  ************************************************************
1886  *                          MM                              *
1887  ************************************************************
1888  PROCEDURE mm
1889  C=" "
1890  CLEAR
1891  @ 2,32 SAY "*** MAIN MENU ***"
1892  @ 5,5 SAY "PLEASE ENTER YOUR SELECTION (S/I/D/R/U/Q) > " GET C
1893  @ 8,5 SAY "S - SYSTEM SETUP"
1894  @ 10,5 SAY "I - INPUT DATA"
1895  @ 12,5 SAY "D - DEVELOP DEPLOYMENT SCENERIO"
1896  @ 14,5 SAY "R - RUN REPORTS"
1897  @ 16,5 SAY "U - UTILITIES"
1898  @ 18,5 SAY "Q - QUIT"
1899  READ
1900  RETURN
1901  ************************************************************
1902  *                          IN                              *
1903  ************************************************************
1904  PROCEDURE in
1905  DO WHILE UPPER(C)<>"Q"
1906     C=" "
1907     CLEAR
1908     @ 2,31 SAY "*** INPUT MENU ***"
1909     @ 5,5 SAY " PLEASE ENTER YOUR SELECTION (D/I/S/T/Q) > "GET C
1910     @ 7,5 SAY " * THE DEMAND REGION DATA FILE MUST BE COMPLETE **
1911     @ 8,5 SAY " * PRIOR TO ACCESS OF ANY OTHER INPUT FILES.    **
1912     @ 10,5 SAY "D - DEMAND REGION DATA INPUT"
1913     @ 12,5 SAY "I - INCIDENT DATA INPUT"
1914     @ 14,5 SAY "S - STATION DATA INPUT"
1915     @ 16,5 SAY "T - TARGET HAZARD INPUT"
1916     @ 18,5 SAY "Q - QUIT"
1917     READ
1918     DO CASE
1919     CASE UPPER(C)="Q"
1920        EXIT
1921     CASE UPPER(C)="D"
1922        DO ind
1923     CASE UPPER(C)="I"
1924        DO ini
```

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```
1925    CASE UPPER(C)="S"
1926       DO ins
1927    CASE UPPER(C)="I"
1928       DO INT
1929    ENDCASE
1930    C=" "
1931 ENDDO
1932 C=" "
1933 RETURN
1934 ************************************************************
1935 *                          BPW                             *
1936 ************************************************************
1937 PROCEDURE bpw
1938 cd=0
1939 C=" "
1940 @ 2,18 SAY "*** ACCESS REGION BREAK POINT WORKSHEET ***"
1941 DO WHILE UPPER(C)<>"Q"
1942    D=01.0
1943    USE eram_b
1944    ZAP
1945    C=" "
1946    @ 5,0 CLEAR
1947    @ 5,5 SAY "ENTER DISTANCES ON TRAVERSE FROM THE STATION THROUGH THE"
1948    @ 7,5 SAY "ACCESS POINTS TO THE REGION YOU ARE TESTING FOR THE"
1949    @ 9,5 SAY "EXISTANCE OF A BREAK POINT IN ACCESS TO THE REGION."
1950    @ 11,5 SAY "PLEASE SELECT  CONTINUE / QUIT  (C/Q) > "GET C
1951    READ
1952    IF UPPER(C)="Q"
1953       EXIT
1954    ENDIF
1955    DO WHILE D<>0
1956       D=0
1957       @ 15,0 CLEAR
1958       @ 15,5 SAY "ENTER DISTANCE OR '0' TO END >" GET D PICTURE "99.9"
1959       READ
1960       IF D=0
1961          EXIT
1962       ELSE
1963          APPEND Blank
1964          REPLACE dist WITH D
1965       ENDIF
1966    ENDDO
1967    SUM dist TO sr
1968    COUNT TO cr
1969    cd=sr/2
```

```
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1970     @ 15,0 CLEAR
1971     @ 15,5 SAY "BREAK POINT ="
1972     @ 15,25 SAY cd PICTURE "99.9"
1973     WAIT
1974  ENDDO
1975  RETURN
1976  ************************************************************
1977  *                          HST                             *
1978  ************************************************************
1979  PROCEDURE hst
1980  y=" "
1981  C=" "
1982  F="        "
1983  DO WHILE UPPER(C)<>"Q"
1984     CLEAR
1985     @ 2,24 SAY "*** DEPLOYMENT SCENERIO MENU ***"
1986     @ 5,5 SAY "PLEASE ENTER YOUR SELECTION (D/S/Q) >" GET C
1987     @ 7,5 SAY "D   DEPLOYMENT NAME AS SELECTION CRITERIA"
1988     @ 9,5 SAY "S - STATION AS SELECTION CRITERIA"
1989     @ 19,5 SAY "Q - QUIT"
1990     READ
1991     DO CASE
1992     CASE UPPER(C)="Q"
1993        EXIT
1994     CASE UPPER(C)="D"
1995        CLEAR
1996        !DIR ds*.dbf /W
1997        @ 20,5 SAY "ENTER DEPLOYMENT NAME OR 'ALL' TO SELECT (name/ALL) >" GET F
1998        READ
1999        USE eram_h
2000        INDEX ON FILE+c_p+station TO INDEX
2001        IF UPPER(F)="ALL"
2002           LIST ALL TO PRINT
2003        ELSE
2004           LIST ALL FOR FILE="&F" TO PRINT
2005        ENDIF
2006     CASE UPPER(C)="S"
2007        @ 5,0 CLEAR
2008        @ 5,5 SAY "ENTER STATION LOCATION OR 'ALL' TO SELECT (xxxyyy,ALL) >" GET F
2009        READ
2010        USE eram_h
2011        INDEX ON station+c_p+FILE TO INDEX
2012        IF UPPER(F)="ALL"
2013           LIST ALL TO PRINT
2014        ELSE
```

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```
2015          LIST ALL FOR station="&F" TO PRINT
2016       ENDIF
2017    ENDCASE
2018    C=" "
2019 ENDDO
2020 C=" "
2021 RETURN
2022 ************************************************************
2023 *                          DS                              *
2024 ************************************************************
2025 PROCEDURE ds
2026 cp=" "
2027 F=" "
2028 C=" "
2029 fn="        "
2030 fs="       "
2031 fi="  "
2032 m="N"
2033 E=".DBF"
2034 I="ERAM_I"
2035 CLEAR
2036 @ 2,21 SAY "*** DEPLOYMENT SCENERIO DATA INPUT ***"
2037 DO WHILE UPPER(C)<>"Q"
2038    C=" "
2039    @ 5,0 CLEAR
2040    @ 5,5 SAY "PLEASE ENTER YOUR SELECTION (A/Q) >" GET C
2041    @ 7,5 SAY "A - ADD A DEPLOYMENT SCENERIO"
2042    @ 9,5 SAY "Q - QUIT"
2043    READ
2044    DO CASE
2045    CASE UPPER(C)="Q"
2046       CLOSE DATABASES
2047       C=" "
2048       EXIT
2049    CASE UPPER(C)="A"
2050       DO WHILE UPPER(F)<>"N"
2051          fn="        "
2052          @ 5,0 CLEAR
2053          @ 5,5 SAY "ENTER FILENAME FOR THE DEPLOYMENT SCENERIO (NAME/QUIT) >" GET fn
2054          @ 7,5 SAY "NOTE >>  NAMES - MUST START WITH 'DS ' & HAVE NO EXTENSION"
2055          @ 8,5 SAY "EXAMPLES - DS12 / DSEAST / DSOAK2C / DSMOVE3"
2056          @ 10,5 SAY "QUIT - ENTER THE FULL WORD  'QUIT'  TO EXIT"
2057          READ
2058          IF UPPER(fn)="QUIT"
2059             CLOSE DATABASES
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
2060            RETURN
2061         ENDIF
2062         IF FILE ("&FN&E")
2063            @ 12,5 SAY "FILE ALREADY EXISTS ... SELECT A NEW FILENAME"
2064            f="E"
2065            WAIT
2066         ELSE
2067            f="N"
2068         ENDIF
2069      ENDDO
2070      USE eram_r
2071      COPY STRUCTURE TO &fn
2072      USE &fn
2073      APPEND FROM eram_d FIELDS lx,ly,dth,ddr
2074      REPLACE ALL r1ct WITH 99.9
2075      REPLACE ALL r2ct WITH 99.9
2076      REPLACE ALL r1pt WITH 99.9
2077      REPLACE ALL r2pt WITH 99.9
2078      fi=" "
2079      DO WHILE fi<>"Q"
2080         F=" "
2081         DO WHILE UPPER(F)<>"L"
2082            fi=" "
2083            @ 7,0 CLEAR
2084            @ 7,5 SAY "ENTER AN INCIDENT DATA FILE YEAR TO INCLUDE IN SCENERIO >" GE
2084 T fi
2085            @ 9,5 SAY "## - YEAR OF INCIDENT DATA"
2086            @ 11,5 SAY "Q - QUIT"
2087            READ
2088            IF UPPER(fi)="Q"
2089               CLOSE DATABASES
2090               EXIT
2091            ENDIF
2092            IF .NOT. FILE("&I&FI&E")
2093               @ 13,5 SAY "UNABLE TO LOCATE FILE ... SELECT A NEW DATABASE NAME"
2094               F="U"
2095               WAIT
2096            ELSE
2097               F="L"
2098            ENDIF
2099         ENDDO
2100         IF UPPER(fi)="Q"
2101            EXIT
2102         ENDIF
2103         USE &I&fi
```

```
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2104          SELECT 2
2105          USE &fn
2106          SELECT 1
2107          @ 7,0 CLEAR
2108          @ 7,5 SAY "PROCESSING INCIDENT DATA ... PLEASE WAIT"
2109          DO WHILE .NOT. EOF()
2110             X=lx
2111             y=ly
2112             s=iss
2113             o=ios
2114             SELECT 2
2115             IF lx<>X .OR. ly<>y
2116                @ 7,0 CLEAR
2117                @ 7,5 SAY "FILE MATCHING ERROR - ABORT - CALL SOFTWARE SUPPORT"
2118                WAIT
2119                CLOSE DATABASES
2120                RETURN
2121             ENDIF
2122             REPLACE fss WITH fss+s
2123             REPLACE fos WITH fos+o
2124             SKIP
2125             SELECT 1
2126             SKIP
2127          ENDDO
2128          @ 7,0 CLEAR
2129          @ 7,5 SAY "PROCESSING COMPLETE"
2130          WAIT
2131       ENDDO
2132       CLOSE ALL DATABASES
2133       DO WHILE fs<>"QUIT"
2134          F=" "
2135          DO WHILE UPPER(F)<>"L"
2136             fs="       "
2137             @ 7,0 CLEAR
2138             @ 7,5 SAY "STATION DATABASE FILENAME TO INCLUDE IN SCENERIO (NAME/QUIT)>
2138 " GET fs
2139             @ 9,5 SAY "filename - STATION DATABASE FILENAME"
2140             @ 11,5 SAY "QUIT - ENTER FULL WORD 'QUIT' TO EXIT"
2141             READ
2142             IF UPPER(fs)="QUIT"
2143                CLOSE DATABASES
2144                EXIT
2145             ENDIF
2146             IF .NOT. FILE("&FS&E")
2147                @ 13,5 SAY "UNABLE TO LOCATE FILE ... SELECT A NEW DATABASE NAME"
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
2148              f="U"
2149              WAIT
2150           ELSE
2151              f="L"
2152           ENDIF
2153        ENDDO
2154        IF UPPER(fs)="QUIT"
2155           EXIT
2156        ENDIF
2157        cp=" "
2158        @ 9,0 CLEAR
2159        @ 9,5 SAY "FOR THIS LOCATION ON THIS INPUT RUN - IS THIS A CURRENT"
2160        @ 11,5 SAY "OR A PROPOSED STATION LOCATION  (C/P)  >" GET cp
2161        @ 13,5 SAY "C - CURRENT STATION CONFIGURATION INPUT"
2162        @ 15,5 SAY "P - PROPOSED STATION DEPLOYMENT INPUT"
2163        READ
2164        USE eram_h
2165        APPEND Blank
2166        REPLACE FILE WITH fn
2167        REPLACE station WITH fs
2168        REPLACE c_p WITH cp
2169        USE &fs
2170        DO inscalc
2171        SELECT 2
2172        USE &fn
2173        SELECT 1
2174        @ 7,0 CLEAR
2175        @ 7,5 SAY "PROCESSING 1st & 2nd DUE RESPONSE DATA ... PLEASE WAIT"
2176        DO WHILE .NOT. EOF()
2177           X=lx
2178           y=ly
2179           D=sld
2180           t=slt
2181           SELECT 2
2182           IF lx<>X .OR. ly<>y
2183              @ 7,0 CLEAR
2184              @ 7,5 SAY "FILE MATCHING ERROR - ABORT - CALL SOFTWARE SUPPORT"
2185              WAIT
2186              CLOSE DATABASES
2187              RETURN
2188           ENDIF
2189           DO CASE
2190           CASE UPPER(cp)="C"
2191              DO CASE
2192              CASE rlct>t
```

ERAM - EMERGENCY RESPONSE ANALYSIS MODEL

```
2193                   REPLACE r2ci WITH r1ci
2194                   REPLACE r2cd WITH r1cd
2195                   REPLACE r2ct WITH r1ct
2196                   REPLACE r1ci WITH fs
2197                   REPLACE r1cd WITH D
2198                   REPLACE r1ct WITH t
2199                CASE r2ct>t
2200                   REPLACE r2ci WITH fs
2201                   REPLACE r2cd WITH D
2202                   REPLACE r2ct WITH t
2203                ENDCASE
2204             CASE UPPER(cp)="P"
2205                DO CASE
2206                CASE r1pt>t
2207                   REPLACE r2pi WITH r1pi
2208                   REPLACE r2pd WITH r1pd
2209                   REPLACE r2pt WITH r1pt
2210                   REPLACE r1pi WITH fs
2211                   REPLACE r1pd WITH D
2212                   REPLACE r1pt WITH t
2213                CASE r2pt>t
2214                   REPLACE r2pi WITH fs
2215                   REPLACE r2pd WITH D
2216                   REPLACE r2pt WITH t
2217                ENDCASE
2218             ENDCASE
2219             SKIP
2220             SELECT 1
2221             SKIP
2222          ENDDO
2223          @ 7,0 CLEAR
2224          @ 7,5 SAY "PROCESSING COMPLETE"
2225          WAIT
2226       ENDDO
2227       CLOSE DATABASES
2228    ENDCASE
2229 ENDDO
2230 CLOSE DATABASES
2231 RETURN
2232 ************************************************************
2233 *                        INT.FMT                           *
2234 ************************************************************
2235 PROCEDURE int.fmt
2236 @  1, 28  SAY "*** TARGET HAZARD INPUT ***"
2237 @  4,  4  SAY "NEXT COORDINATE - PgDn   CONFIRM COUNT - Enter        RETURN"
```

```
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@ 5, 4 SAY "PREV COORDINATE - PgUp   MOVE CURSOR   - ARROW KEYS   TO MENU - "End"
@ 10, 23 SAY "TARGET LOCATION"
@ 10, 43 SAY  lx
@ 10, 48 SAY ","
@ 10, 50 SAY  ly
@ 14, 19 SAY "ENTER 'T' IF TARGET HAZARD      >"
@ 14, 55 GET  dth
@ 8, 15 TO 16, 62    DOUBLE
@ 12, 16 TO 12, 61
@ 3, 3 TO 6, 74
@ 4, 56 TO 5, 56
@ 4, 27 TO 5, 27
**********************************************************************
*                          INI.FMT                                   *
**********************************************************************
PROCEDURE ini.fmt
@ 1, 28 SAY "**** INCIDENT DATA INPUT ****
@ 4, 4 SAY "NEXT COORDINATE - PgDn   CONFIRM COUNT - Enter        RETURN"
@ 5, 4 SAY "PREV COORDINATE - PgUp   MOVE CURSOR   - ARROW KEYS   TO MENU - "End"
@ 10, 23 SAY "INCIDENT LOCATION"
@ 10, 43 SAY  lx
@ 10, 48 SAY ","
@ 10, 50 SAY  ly
@ 14, 19 SAY "STRUCTURAL INCIDENT COUNT       >"
@ 14, 55 GET  isa  RANGE 0, 999
@ 16, 19 SAY "NON - STRUCTURAL INCIDENT COUNT >"
@ 16, 55 GET  ioa  RANGE 0, 999
@ 8, 15 TO 18, 62    DOUBLE
@ 12, 16 TO 12, 61
@ 3, 3 TO 6, 74
@ 4, 56 TO 5, 56
@ 4, 27 TO 5, 27
**********************************************************************
*                          INL.FMT                                   *
**********************************************************************
PROCEDURE inl.fmt
@ 1, 28 SAY "**** LOCATION INFO INPUT ****
@ 4, 4 SAY "NEXT COORDINATE - PgDn   CONFIRM COUNT - Enter        RETURN"
@ 5, 4 SAY "PREV COORDINATE - PgUp   MOVE CURSOR   - ARROW KEYS   TO MENU - "End"
@ 10, 23 SAY "LOCATION"
@ 10, 43 SAY  lx
@ 10, 48 SAY ","
@ 10, 50 SAY  ly
@ 14, 23 SAY "ENTER LOCATION DESCRIPTION BELOW "
@ 16, 16 GET  ldesc
```

```
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2283  @  8, 14  TO 19, 67    DOUBLE
2284  @ 12, 15  TO 12, 66
2285  @  3,  3  TO  6, 74
2286  @  4, 56  TO  5, 56
2287  @  4, 27  TO  5, 27
2288  ************************************************************
2289  *                          SDI.FMT                         *
2290  ************************************************************
2291  PROCEDURE sdi.fmt
2292  @  0, 17  SAY "**** ACCESS REGION MATRIX FOR "+fg+" ****"
2293  @  1,  2  SAY "REMEMBER - FIRST RECORD IN MATRIX SHOULD BE FOR THE STATION w/ DISTAN
2293  CE = 0"
2294  @  3,  6  SAY "WHEN YOU COMPLETE AN ACCESS RULE, THE NEXT BLANK RECORD IN THE"
2295  @  4,  6  SAY "MATRIX WILL BE PRESENTED FOR INPUT."
2296  @  5, 56  SAY "|CONFIRM w/"
2297  @  6,  6  SAY "RETURN TO MENU - ^END | REVIEW MATRIX - PgUp/PgDn |ENTER key"
2298  @  9, 14  SAY "TO ACCESS REGION   '"
2299  @  9, 34  GET  mid
2300  @  9, 35  SAY "'"
2301  @ 11, 14  SAY "TRAVEL"
2302  @ 11, 25  GET  mld
2303  @ 11, 31  SAY "MILES FROM THE STATION TO"
2304  @ 13, 14  SAY "THE LAST ACCESS POINT PRIOR TO THE INCIDENT"
2305  @ 15, 14  SAY "AT"
2306  @ 15, 18  GET  lx
2307  @ 15, 23  SAY ","
2308  @ 15, 25  GET  ly
2309  @ 15, 32  SAY "AND USE DISTANCE ESTIMATION"
2310  @ 17, 14  SAY "TECHNIQUE '"
2311  @ 17, 25  GET  mdt
2312  @ 17, 26  SAY "' TO COMPLETE TO RESPONSE DISTANCE"
2313  @ 19, 14  SAY "CALCULATION."
2314  @  8, 11  TO 20, 62
2315  @  2,  4  TO  7, 69
2316  ************************************************************
2317  *                         FE89                             *
2318  ************************************************************
2319  PROCEDURE fe89
2320  fn="        "
2321  c=" "
2322  f="*.DBF"
2323  CLEAR
2324  DO WHILE UPPER(C)<>"Q"
2325     @ 2,30 SAY "****   FILE EDITOR   ****"
2326     @ 5,5 SAY "ENTER NAME OF FILE TO EDIT (filename) > " GET fn
```

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```
2327     @ 7,5 SAY "DO YOU WISH TO BROWSE/EDIT/OR QUIT (B/E/Q) > " GET C
2328     READ
2329     IF FILE("&FN&E")
2330        DO CASE
2331        CASE UPPER(C)="Q"
2332           EXIT
2333        CASE UPPER(C)="B"
2334           USE &fn
2335           BROWSE
2336           CLEAR
2337        CASE UPPER(C)="E"
2338           USE &fn
2339           EDIT
2340           CLEAR
2341        ENDCASE
2342        C=" "
2343     ELSE
2344        @ 5,5 CLEAR
2345        @ 5,5 SAY "FILE NOT FOUND ERROR"
2346        WAIT
2347     ENDIF
2348  ENDDO
2349  RETURN
```

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