AN OPERATIONAL PLANNING INFORMATION SYSTEM FOR SMALL COMMUNITIES

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Technical Paper

AN OPERATIONAL PLANNING INFORMATION SYSTEM FOR SMALL COMMUNITIES

TO: J. F. McLaughlin, Director
Joint Highway Research Project

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FROM: H. L. Michael, Associate Director
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Respectfully submitted,

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AN OPERATIONAL PLANNING INFORMATION
SYSTEM FOR SMALL COMMUNITIES

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INFORMATIVE ABSTRACT

The wealth of data collected on the urban area by a multiplicity of people for a multiplicity of purposes has led to an inefficient, disorganized utilization of resources for data handling. Until recently, most of the information collected has been gathered by a specific group for a specific purpose. This information was not useable by other than the primary data recipient because of its narrow definitions and specific characteristics.

Provided herein is a system whereby data that are collected only once are useable by all segments of the urban environment. Universally compatible definitions, aggregation unit, and procedures are developed. Computer programs were developed to handle the data for the system. The Environmental Data Storage and Retrieval System (EDSARS) will make a useful tool for all segments of the urban environment by putting all

generally useable data in one place with one set of definitions and aggregated on one useful module, utilizing one set of data handling procedures. The basic unit of data collection was established on a parcel basis, thereby providing a high degree of flexibility in data aggregation.

The conceptual development of information theory as it applies to urban data systems was first explored. The actual conceptual development of EDSARS is explained next, followed by the operational procedures needed to utilize the EDSARS system.

INTRODUCTION

DATA NEEDS

Fundamental to the planning process is the development of alternative plans which are provided to the decision maker for action. These plans develop as a result of thorough analysis of proper and sufficient data. Analyses are good as, but no better than the data quality. The present trend seems to be to seek more symptomatic relationships, which implies more data variables. Today it appears almost natural for researchers to add additional variables to the correlation analysis for the purpose of increasing the amount of variability of the dependent variable that can be explained. In spite of the general knowledge of the costliness of data collection, more data are being collected by more people for more reasons than ever before.

The value of data for proper analysis is not under question. The critical point is the efficiency of the entire data system, not from the standpoint of an individual user but in terms of total system costs. Data are being collected on many aspects, from the individuals' health to the number of trips he makes. In the past, most of this information has been gathered by a specific agency for a specific use, each agency applying its

own individualized definitions to the data. For example, definitions of land use density can range from trips generated per acre to persons per square foot of floor space. The definition has always depended upon the information user. This multiplicity of data definitions and uses results in a hodgepodge of data, collected many times by many agencies and many times without knowledge of each other's efforts (1)*.

Public agencies gather much of their data for normal operations; these data could be very useful to other agencies at little additional cost, if only common definitions and parameters could be established. Without these common definitions and parameters it is difficult for each agency to visualize the urban environment except in the perspective of its own narrowly defined information requirements.

Each urban area has developed a multiplicity of plans to channel the growth of the area in a manner that is deemed best for the community as a whole. Up to the present, just as the different agencies collect and use their own data, so do the various urban studies. While a Recreational or School Plan may use much of the data collected in a Transportation Study, the difference in data definitions and aggregation units makes the information nearly useless for any study other than the one that collected the data.

There are many segments of the urban environment which desire information on the community. The present means of getting this information is for each to go out into the urban area and collect the data directly. Any company, organization, or group that presently wants data on the community must collect the information itself or accept the narrow definitions of the data now established by existing governmental groups or studies.

*Numbers in parenthesis refer to numbers in list of references.

In order to facilitate the use of data by other than the primary information receiver, a set of universally compatible definitions is needed. This set of definitions is not impossible to develop if one attempts to direct the collection of "pure" data. The term "pure" simply means that the information should not be aggregated before collection. For instance, when square feet of space is collected, it should be recorded as square feet, not square feet per some other dimension. For example, square feet per employee may be useful to an industry, but square feet of building and number of employees is much more useful for planning purposes while still serving the original purpose.

The data system that is described below seeks to develop a tool for urban decision making that utilizes data from many sources and makes this information available and useable by other sectors of the urban community.

The Scope

The project described involved the development of an urban data system for an area of approximately 100,000 population. The Lafayette-West Lafayette area was used to demonstrate the application of the developed system. The Greater Lafayette area had under consideration the conduct of a Land Use and Transportation study. In anticipation of the development of these data, this planning information system was developed. The system was to be much broader than the proposed study and is referred to as the Environmental Data Storage and Retrieval System (EDSARS).

The first developmental problem involved choosing the degree of sophistication needed for such a system. This involved choosing a particular level in a hierarchy of data system complexity. Once the level of sophistication had been decided, the basic data collection and aggregation module was chosen. The data to be used was decided along with specific definitions

for each data item. The methodology for entering these data into the system was developed along with updating procedures to keep information current. A logical and easily useable means of data storage and retrieval was developed to facilitate the use of the system by a wide variety of users.

DESCRIPTION OF EDSARS

Level of Data Sophistication

The information used in the Environmental Data Storage Retrieval System (EDSARS) is taken from the level in data hierarchy of a data library. Banked data, which is another level in the information hierarchy, are organized into machine records but need not be functional or logical in format. Raw data make up the lowest level of data sophistication. These data are not machine digestable and therefore are not useable in an organized data system. The data library information is logical and functional in format and can be updated, searched, and retrieved; these requirements are essential for any urban data system.

Level of System Sophistication

The three levels of system sophistication vary in the complexity of models incorporated. The first level uses no models, the second utilizes specialized models, while the third level uses simulation. EDSARS, being an attempt at developing the initial phase of an urban data system, utilizes the first level of sophistication. The system contains tabulated data but no specialized or simulation models. It is felt that the model requirements will evolve from the demands of the users on the data system. The addition of models to the system can be made within the present format; the data in the system will directly feed any models developed in the future.

The computer hardware that is incorporated also influences the level of system sophistication. EDSARS utilizes the CDC 6500 computer at Purdue University. This is a general purpose computer; the programming language used is Chippewa Fortran. The data system can be initialized and information retrieved or updated by merely submitting the correct program deck to the computer science center. The updating, retrieval or initialization will be run just as any other job that is submitted to the computer. The information for EDSARS is now stored on tape. As the system is initialized and the amount of stored information grows, the incorporation of a "disk pack" will become feasible. A "disk pack" is a mountable disk storage device that enables random access of information. This direct access feature will save valuable computer time when the system searches large quantities of data.

The decisions on the level of system sophistication were the result of many factors. Models were not incorporated into the system because of the necessity of actual data to test the validity of a model. This project outlines the initialization of EDSARS without actually inserting real data. The amount of data needed to initialize the system makes initialization another entire project of at least one to two years in duration. Once the initialization is complete, then the addition of models can be considered.

The decision of using the CDC 6500 computer was made in light of the hardware available. Purdue University now has an IBM 7094 computer which could handle a data system such as EDSARS. However, the 7094 is a second generation computer; this type of computer is now in the process of being phased out by many organizations; being replaced by a "third generation" computer such as the CDC 6500 computer. Any work done in the future on data systems will most probably be done on the more advanced equipment such as the CDC 6500. The use of Chippewa Fortran was the result of the authors'

knowledge of the language and the fact that the Fortran developed for the CDC system is quite efficient in its data-handling capabilities.

Data Module

The data module chosen for EDSARS is the parcel. This aggregation module seems to be almost the universal choice by existing urban data systems. The parcel provides a flexible, multi-purpose base from which to work. The data to be incorporated into an urban data system are easily keyed to the parcel. The tagging methods, which will be discussed below, work well with the parcel module. The parcel forms a very useful aggregation unit in that it is the largest common denominator that can be used to build zones. Any zone in an urban area can be represented fairly accurately, by a composite of parcels. This gives the system maximum flexibility in the designation of zones while containing a minimum number of data units.

The parcel in EDSARS is defined as all contiguous land under one ownership and one general land use. This definition closely parallels the parcel used in assessors' records. If two adjacent pieces of land are owned by the same person and used for the same purpose, they would be listed as one parcel. If two adjacent parcels had different uses, they could be listed as two parcels. This definition, being general, allows a certain measure of ambiguity in the designation of a parcel; the system has the facility, however, of being able to join two or more parcels into one new parcel, or break up one parcel into two or more parcels. This facility for redefining parcels allows the system to establish its own equilibrium as the data are used and reevaluated.

A special definition of the parcel is utilized when coding rights-of-way. Each street segment and utility right-of-way is coded just as any other parcel. A street or right-of-way is broken down into block long

segments if the block length is 500 feet or less; if the block length is longer than 500 feet, the block is broken down into segments of 500 feet or less. An intersection is taken as a street parcel. The parcel boundaries are defined as the right-of-way line for the street segments. An example of an area divided into parcels can be found in Figure 1.

Data Tagging Methods

EDSARS uses both the name method and location method of tagging data. The name tag utilized is the street address of a building or empty parcel. The street number, name and type (e.g., Drive, Street, Lane, etc.) are all noted in the name tag of the parcel or building. For rural areas, the street number is replaced by the rural route number, and the street name is replaced by "Rural Route." The name method of tagging gives the system the facility of locating data for the user on a basis that is familiar to all segments of the urban environment. Street addresses are universally known and understood, and, therefore, enable all potential users to be familiar with at least one retrieval method.

Street segments are coded by the street name and the number (in hundreds) of most of the houses on the street segment. A street segment along a street called Main Street, where house numbers go from 100-225 would be coded as 100B Main Street. This indicates that this is the one hundred block of Main Street. This gives the benefits of the name tag to street segments as well as individual parcels and buildings.

The location tag utilized by EDSARS is a rectangular grid coordinate system which is superimposed over the entire development area. The grid coordinate uses one foot as the basic unit. The parcels and street lengths are tagged by the coordinates of their approximate centroid. The actual digitizing of the coordinates is accomplished by an automatic

coordinate digitizer. By utilizing a location tag, internal logic is added to the data in EDSARS. The coordinates facilitate the retrieval of data on an areal basis. Data for certain geographical segments of the development area can be directly retrieved with the use of the coordinates. Density computations become immediately possible with the use of coordinates.

The utilization of rectangular grid coordinates provides another very useful capability. A zone, such as a Census Tract or Transportation Zone, can be represented by the grid coordinates of its boundary. This is accomplished by representing the zone by a series of triangles and digitizing the coordinates of the vertices. By representing zones in this way, a dictionary of zone names and grid coordinates is developed. When any information is desired on a zonal basis, the coordinates of the zone are read and each parcel is tested to establish whether or not it lies within the zone in question. The information for each parcel within the zone is then retrieved and aggregated thereby giving information on the desired zonal basis. Figure 2 shows a zone broken into triangles for coding.

In order to coordinate the actual data incorporated into the system and the tags for each parcel, a dictionary with the parcel number, building number, and street address (or block number for street segments) developed. Another file coordinating each parcel number and grid coordinate is then initialized. The actual data are stored in conjunction with a parcel number. The data are related to the name and location tags through the parcel number-building number-street address dictionary and the parcel number-grid coordinate dictionary. The parcel number is merely a unique number of 1 to 6 digits given to each parcel. The numbers need not be consecutive or have any logical order. The only requirement is that each parcel have one and only one unique number.

Data Dimensions

The definition of land use developed by the Metropolitan Washington Council of Governments was utilized to aid in determining the data needed to define the different areas of land use. Data were examined in the light of how well they defined:

1. Type of activity
2. Type of structure
3. Type of land use
4. Intensity of use
5. Aesthetic qualities
6. Restrictions on use
7. Nuisance characteristics
8. Economic functions (2)

In order to completely describe the urban environment, the information on each parcel is broken down into three categories:

1. Parcel Information - information on the parcel itself, including dimensions, restrictions, zoning, use, etc.
2. Building Information - information on each building on a parcel, including age, value, type of construction, condition, size, etc.
3. Establishment Information - specific information on each unit within a building such as a business, a dwelling unit, etc., including space use, number of employees, number of residents, age of residents, number of vehicles, etc.

I. Parcel Information

1. Land use	13. Zoning
2. Ownership	14. Zone change request number
3. Frontage	15. Variance number
4. Area	16. Comprehensive Plan use
5. Year of subdivision	17. Utilities
6. Assessed value of land	18. Parking spaces
7. Easement	19. Loading area
8. Landmark	20. Assessed value of improvements
9. Neighborhood characteristics	21. Total assessed value
10. Land appearance	22. Sale date
11. Number of structures	23. Sale price
12. Year of zoning change	24. Nuisances

(The following data are collected for street segment parcels)

25. Intersection	35. Speed limit
26. Length of segment	36. Curb parking regulations
27. Right-of-way width	37. Curb type
28. Pavement width	38. Sidewalks
29. Functional class	39. Number of lanes
30. Structural composition	40. Loading zone
31. Per cent grade	41. Bus route
32. Average daily traffic	42. School route
33. Number of accidents	43. Access control
34. Traffic control signs and signals	44. Condition

II. Building Information

1. Year built	9. Basement
2. Type of construction	10. First floor area
3. Type of structure	11. Number of dwelling units
4. Building condition	12. Building setback
5. Year of latest building permit	13. Required setback
6. Cumulative cost of building permits	14. Rehabilitation cost
7. Number of floors	15. Type of building code violation
8. Total floor area	16. Number of building code violations
	17. Number of establishments

III. Establishment Information

1. Space use	8. Vehicles owned
2. Total number of employees	9. Police calls
3. First floor area	10. Fire calls
4. Total floor areas	11. Welfare payment
5. Number of rooms for rent	12. Number of communicable diseases
6. Number of residents by sex and age group	13. Type of communicable diseases
7. Family income	14. Rent

Each piece of data that was entered into the system was judged to be important to the planning community, able to be updated, and relatively easy to collect. Data that were too expensive to collect or not updatable were not incorporated into the system.

OPERATION OF EDSARS

Data File Characteristics

The data in EDSARS are established in four separate files. The first data file contains parcel numbers and parcel grid coordinates. Each parcel is given a unique number to identify it as a data entity; this number is correlated to the grid coordinates of the approximate parcel centroid by the Parcel Number-Grid Coordinate File. The second data file contains the parcel number, building number and address of each building in the system. In the case of a parcel with no building, the building number is listed as zero. Each building is given a unique number on a parcel, and coordinated to the correct address by the Parcel Number-Building Number-Address File. The third data file contains the parcel number and all general data on that parcel. The data for each parcel are correlated to the street address and grid coordinate via the parcel number. The fourth data file contains zone names and the coordinates of the zone boundary.

These four data files make up the data storage portion of EDSARS. The actual data is stored on tape and can be manipulated by a set of package programs. The first set of programs is used to initialize the system by reading cards and writing the information on tape. The second set of programs is used to incorporate more data items when they become available. The third set of programs is used to read the data tape and write on paper. This set of programs is used to check the other program sets and to give a complete list of all data in the system. The fourth set of programs is used to update the values of data items in the system when current information becomes available. The fifth and final set of programs is used to retrieve information from the system for special user purposes. The following is an explanation of the package programs and procedures for using them in EDSARS.

General Program Information

Each of the programs discussed below is used to manipulate the data in EDSARS. When data cards are to be read into the system, a card with "7, 8 and 9" punched in column one must follow the main body of the program and precede the actual data cards. When reading General Data cards, the last card should have a "99" in columns seven and eight. This indicates end-of-data to the system. The last data card in the Zone-Grid Coordinate File, the Parcel Number-Building Number-Address File, and Parcel Number-Grid Coordinate File should be blank to indicate end-of-data to the system. The last data card is followed by a card with "6, 7, 8, and 9" punched in column one. This indicates end-of-program to the computer. If no data cards are used in a program, the "6, 7, 8, and 9" card immediately follows the main body of the program.

Data File Initialization

Parcel Number-Grid Coordinate File

The initialization of the Parcel Number-Grid Coordinate File occurs first. To initialize this file, the coordinate digitizer of the Joint Highway Research Project at Purdue was utilized. An accurate base map of the entire development area was placed on the digitizer and a point 1,000 feet south and 1,000 feet west of the southwestern corner of the development area was set as point (0,0). Key points on the base map were digitized; the digitizer gave readings in inches and these readings were then converted to feet; the conversion depended upon the scale of the map utilized.

The key points digitized were the intersection of street center lines. The key points that are located on the base map were digitized on the more accurate maps, and the coordinates of these key points served as reference coordinates for the digitizing of all parcels.

Each map to be digitized, other than the base map, was first broken up into parcels and approximate centroids located as shown in Figure 1. Consecutive parcel numbers are then written on the map for each parcel. The map is placed on the digitizer, its key point located (for coordinate conversion to the base system), and then each parcel centroid can be digitized. The digitizer will punch the parcel number and the grid coordinates on an IBM card which can then be fed into the computer for coordinate conversion.

The data cards for actual initialization of this data file are read into the system via the "Initialize Parcel Number-Grid Coordinate-File" Program. The data cards for this file should have the format shown in Figure 3. This figure can also serve as a sample coding sheet. The parcel number is placed in columns 1-6. The X coordinate is placed in columns 8-13, and the Y coordinate in columns 15-20. When more information becomes available, a Program titled "Read More Information For The Parcel Number-Grid Coordinate-File" is used. This data file locates all of the parcels in the development area and coordinates the parcel location to a particular parcel number. This number is the identifying tag in the system used to locate all data that pertain to this particular parcel.

Parcel Number-Building Number-Address File

The Parcel Number-Building Number-Address File is initialized by putting the Parcel Number in columns 1-6 and the Building Number in columns 20-21. The street or rural route number is placed in columns 22-27. If the parcel is a street segment, the block number is placed in columns 20-26 with a "B" in column 27 to indicate "street block." All of these numbers should be right justified. Columns 30-69 contain the street name or "Rural Route." The name should start in column 30 and be punched on the card just

as it appears in the town directory with one column between each word in the name. The type of street is coded in columns 70-72. Format for this file card can be found in Fig. 3. When more information becomes available, a program titled "Read More Information For The Parcel Number-Building Number-Address File" is used. This file coordinates each building, vacant parcel and block segment with a particular address in the development area.

General-Data File

The file for general data is initialized after each parcel in the development area has been given a unique number. The format for General Data cards can be found on Figure 4; this figure can also serve as a sample coding sheet. The 01 card is used for every parcel in the development area. The 02 card is used where the parcel has a use other than right-of-way. A 12 card is used in place of the 02 card when a parcel is a right-of-way. If the parcel has multiple land use, zoning or comprehensive land use, an 11 card is used to supplement the 01 and 02 cards. Each building on a parcel is represented by the information on the 03 card, and each establishment (dwelling unit, business, office, etc.) in a building is represented by an 04 card. The information in the General Data File is broken into three categories. The first category is land use information and is represented by the 01, 02, or 12, and 11 cards; the second category is building information which is represented on the 03 card, and the third category is establishment information which is represented on the 04 card.

Each data item in the system is given a specific name. This name is used to refer to the particular data item within the system.

Each building on a parcel is given a number to uniquely identify it; if four buildings exist on one parcel, they would be numbered 1-4. Each establishment within a building is also given a unique number to identify it.

Building numbers start at one, with each separate parcel; establishment numbers start at one, with each separate building. A Program titled "Initialize the General Data File" is used to initialize this data file by reading data cards and writing the information on tape and paper as a check. The Program "Read More Information For the General Data File" is used to read in more information as it becomes available.

Zone-Grid Coordinate File

The last file to be initiated is the Zone-Grid Coordinate File. To define a zone, its boundary is located in the development area by the grid coordinate system. The zone is broken up into triangles and the grid coordinates of each of the three vertices are coded on data cards. The card format is shown in Figure 3. An example of a zone broken into triangles can be found in Figure 2. The coordinate of the vertices are placed on the data card by numbering the vertices 1-3. Point one is coded first, followed by point two, point three, and point one again. The first and last coordinate must be the same in order to close the triangle. The identifying zone name is placed in columns 1-12, the zone number is placed in columns 15-20. The coordinates of the vertices are placed in columns 22-80 in the format shown on Figure 3. The zone name starts in column 1. The zone number and grid coordinates are right justified. Program "Initialize The Zone Name-Grid Coordinate File" is used to initialize this file by reading data cards and writing the data on tape, and paper as a check. To read more information into the system as it becomes available the Program "Read More Information for the Zone-Grid Coordinate File" is used. It should be noted that this file can contain as many zonal systems as required by the users. Census Tracts, Transportation Zones, School Zones, etc. are all examples of possible zonal systems that could be incorporated into this file. The inclusion of a particular zonal system is dependent upon the potential use of its parcel aggregation.

Read Programs

There is a general class of programs in EDSARS that will read the data file tape and print the information on paper. These programs should be used after reading in more data or updating the system to check the accuracy of the tape file. These programs can also be used to obtain a complete list of all information on the tape. These Read Programs will read the Parcel Number-Grid Coordinate file and print a complete list of the tape file, read the Parcel Number-Building Number-Address file and print a complete list of the tape, read the General Data file and print a complete list, read the Zone-Grid Coordinate file and print a complete listing of this information.

Update Programs

In order to change any of the information in the system or update the information, a set of update programs has been developed to replace the old information, with the new. This is accomplished by using the initializing programs to make a tape file of the new information. This new information file and the original file are then used to initialize a new tape file with all of the new information incorporated into it.

All of the update programs require that the new data cards be identical to the original in format. The new cards should be complete - all information that is not changed should still be punched on the update card. The new information is punched on the card replacing the old in the same format. These cards are then used to form the update file. Any data card that has no data changed need not be entered into the update file, but any card that has any piece of information changed must be completely repunched with all of the new and unchanged information.

Retention of Old Data Files

A decision on how many old data files should be kept needs to be approached at this time. Data files represent current data for a certain period of time. The comparison of data files for different time periods can yield useful information on trends that exist in the development area. It is felt that files should be updated at least once a year. These yearly files should be retained for at least a period of five years. The final decision on this policy is, of course, up to the initializing agency.

RETRIEVAL PROGRAMS

To retrieve information from the data files for special purposes, there are a set of programs in EDSARS which give specific information for the special purposes of the user. The following programs were designed to be general in their characteristics so that specific user needs could be satisfied. The retrieval programs available in the system are:

- a. To retrieve a list of Y and X.
- b. To retrieve the sum of Y for a specific X.
- c. To retrieve a list of Y for a specific X.
- d. To retrieve X for specific parcel numbers.
- e. To retrieve a parcel number and building number for a specific address.
- f. To retrieve a list of parcel numbers for a specific zone.

CONCLUSIONS

The following conclusions about EDSARS and its potential can be made:

1. EDSARS should facilitate efficient and economical handling of planning data for an area of about 100,000 population.
2. The utilization of a general purpose computer and general purpose programming languages should make EDSARS available to most metropolitan areas in the United States.

3. The concept of a unified data system is the most important contribution of EDSARS.

4. The data proposed for EDSARS are the most usable and easily obtainable information available to the urban area.

5. The incorporation of a flexible method of representing zones by their location is essential to an efficient urban data system such as EDSARS.

6. The information for an urban data system should be in three separate files so that one file can be updated and improved without disturbing the other files.

7. Zone names and boundary locations should comprise one file; parcel numbers and parcel location comprise another file; parcel numbers, building numbers, and street address should comprise the third file; and the fourth file should be made up of general data.

8. The best unit for data collection is the parcel.

9. The data system should be flexible so that improvements can be made as used and technology increases.

10. The streets and rights-of-way should be represented as special parcels in order to ensure full territorial and information coverage.

11. All data incorporated should be potentially useful and updatable.

12. Utilization of applicable theory and practical experience of existing data systems are needed to develop a useful, efficient and improved data system.

The concepts that are represented by these conclusions when tied together into an urban data system such as EDSARS give the planning community and the urban environment as a whole a flexible and useful tool which should make more information available to more people at a much lower cost and with much less effort.

It is important to acknowledge that the conceptual technique for retrieving information on a zonal basis through the use of coordinates was developed at the University of Washington by Mr. Robert B. Dial. The details of the EDSARS system, including initialization, update and retrieval programs, codes utilized and complete descriptions are available in a Purdue University, Joint Highway Research Project Information Report No. 5, March 1968. Copies are available at the cost of reproduction. This project was funded by the Public Health Service through the Environmental Health Institute of Purdue University.

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FIGURE I. SEPARATING AN AREA INTO PARCELS FOR DATA CODING

FIGURE 2. ZONE DIVIDED INTO TRIANGLES FOR DATA CODING

ZONE NAME										ZONE NUMBER										COORDINATES OF V1										COORDINATES OF V2										COORDINATES OF V3										COORDINATES OF V4									

(1)

PARCEL NUMBER										COORDINATES OF PARCEL CENTROID																			

(2)

PARCEL NUMBER										BUILDING NUMBER										STREET NUMBER										STREET NAME										STREET TYPE									

(3)

FIGURE 3 - FORMAT OF : ZONE NAME - GRID COORDINATE CARD,
 PARCEL NUMBER - GRID COORDINATE CARD, AND
 PARCEL NUMBER - BUILDING NUMBER - ADDRESS CARD

PARCEL NUMBER	CARD CODE	CHANGE DATE MO YR	TRANSACTION CODE	OLD PARCEL NUMBER	LAND USE	OLD	PRESENT	OWNERSHIP	FRONTAGE	AREA (0)	YEAR OF SUBDIVISION	ASSESSED VALUE OF LAND	EASEMENT	LANDMARK CHANGES	LAND APPEARANCE	NO OF STRUCTURES	ZONE CHANGE YEAR OF	ZONING	ZONE CODE REQUEST NUMBER	ZONE VARIATION & EXCEPTION NUMBER	COMPREHENSIVE PLAN USE	FLAG	WATER SYSTEM	SEWER SYSTEM	ELECTRICITY	GAS	WATER WELL	SEPTIC TANK
01																												
PARCEL NUMBER	CARD CODE	CHANGE DATE MO YR	TRANSACTION CODE	EMPLOYEE PARKING	CUSTOMER PARKING	RESIDENTIAL PARKING	COMMERCIAL PARKING	OFF STREET PARKING	ASSESSED IMPROVEMENTS AREA (00)	TOTAL ASSESSED VALUE (00)	SALE DATE	SALE PRICE (00)	GLARE	HEAT	VENTILATION	SMELL	RADIATION	NOISE	ELECTROMAGNETIC INTERFERENCE	SMOKE								
02																												
PARCEL NUMBER	CARD CODE	CHANGE DATE MO YR	TRANSACTION CODE	PRIMARY ZONING	SECONDARY ZONING	TERTIARY ZONING	MAIN COMP	SECOND COMP	THIRD COMP	MAIN LAND USE	SECOND LAND USE	THIRD LAND USE																
11																												
PARCEL NUMBER	CARD CODE	CHANGE DATE MO YR	TRANSACTION CODE	INTERSECTION	LENGTH OF THIS PARCEL SEGMENT	RAW PARCEL WIDTH	PERCENT GRADE	FUNCTIONAL CLASS	ADT	ACCIDENTS	TRAFFIC CONTROL	SIGNS & SIGNALS	SPEED LIMIT	CURB TYPE	SOFTWALKS	NO OF LAMES	LOADING ZONE	BUS ROUTE	SCHOOL ROUTE	ACCESS CONTROL	CONDITION							
12																												
PARCEL NUMBER	CARD CODE	CHANGE DATE MO YR	TRANSACTION CODE	BUILDING YEAR BUILT	OLD NEW	FOUNDATION	FRAME	SHEDDING	MOOF	TYPE OF	STRUCTURE	CUMULATIVE COST OF BUILDING PERMITS (00)	NO OF FLOORS	BASEMENT	FIRST FLOOR AREA	NO OF BUILDING REQUIRED SETBACK	REHABILITATION	COST (00)	NUMBER OF VIOLATIONS OF CODE	ESTABLISHMENT NUMBER OF								
03																												
PARCEL NUMBER	CARD CODE	CHANGE DATE MO YR	TRANSACTION CODE	LOCATION	PRESENT	SPACE USE CODE	OLD	PRESENT	TOTAL EMPLOYEES	FIRST FLOOR AREA (00)	TOTAL FLOOR AREA (00)	NO OF ROOMS	NUMBER OF MALE RESIDENTS	NUMBER OF FEMALE RESIDENTS	FAMILY INCOME (000)	VEHICLES OWNED	POLICE CALLS	FIRE CALLS	TYPE OF ESTABLISHMENT	COMMERCIAL	RECREATION	INDUSTRIAL	OFFICE	RETAIL	RESTAURANT	ENTERTAINMENT		
04																												

FIGURE 4 — FORMAT OF GENERAL DATA CARDS