TYLER COUNTY COMMISSIONER'S COURT
SPECIAL MEETING
SEPTEMBER 13, 1994 --- 11:00 A.M.

THE STATE OF TEXAS

COUNTY OF TYLER   ON THIS THE 13th day of SEPTEMBER, A.D.1994

the Commissioner's Court in and for Tyler County, Texas convened in a
Special Meeting at the Commissioner's Courtroom in Woodville, Texas,
the following members of the Court present, to wit:

JEROME OWENS	COUNTY JUDGE, Presiding
MAXIE L. RILEY	COMMISSIONER, PCT.#1
A.M. BARNES	COMMISSIONER, PCT.#2
JERRY MAHAN	COMMISSIONER, PCT.#3
HENRY EARL SAWYER	COMMISSIONER, PCT.#4
DONECE GREGORY	COUNTY CLERK, Ex-Officio

the following were absent: none   thereby constituting a quorum.
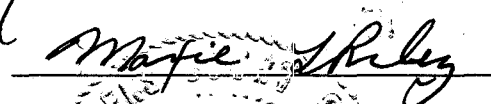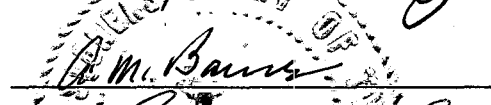In addition to the above were:

JOYCE MOORE   COUNTY AUDITOR

Upon deliberations within the workshop prior to this meeting, a
motion was made by **Commissioner Mahan** and seconded by **Commissioner
Sawyer** to adopt the **resolution** approving the standards for a rural
addressing project for county roads. All voted yes and none no. SEE
ATTACHED RESOLUTION. SEE ATTACHED SUMMATION OF WORKSHOP.

A motion was made by **Commissioner Riley** and seconded by **Commissioner
Mahan** to approve the **Agreement** with **DETCOG** for **funding** of this
project based upon review and approval by Judge Owens. All voted yes
and none no.

BY CONSENSUS OF THE COURT THE MEETING ADJOURNED.

SIGNED: _____ Jerome Owens, County Judge

_____ Maxie L. Riley, Comm. Pct. #1

_____ A. M. Barnes, Comm. Pct. #2

_____ Jerry Mahan, Comm. Pct. #3

_____ Henry Earl Sawyer, Comm. Pct. #4

ATTEST: _____ Donece Gregory, County Clerk
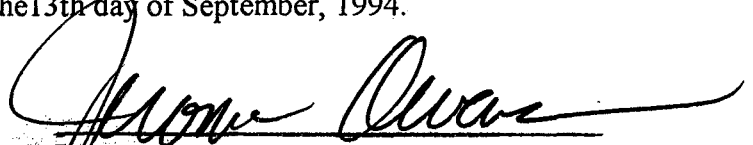
STATE OF TEXAS

COUNTY OF TYLER

TYLER COUNTY COMMISSIONERS COURT
ORDER # 9-13-94
ADOPTED SEPTEMBER 13, 1994

WHEREAS, Tyler County has joined the Deep East Texas Council of Governments, Regional 9-1-1 to facilitate the development, implementation and maintenance of an enhanced 9-1-1 emergency communications system which relies on the automatic display of a caller's phone number and address when they dial 9-1-1; and,

WHEREAS, Chapter 2, County Road and Bridge Act, (Art. 6702-1, Vernons Texas Civil Statutes) Section 2.011 (b) authorizes the Commissioners Court of a county to adopt standards to name and number roads and assign address numbers to property located in the unincorporated areas of the County;

NOW, THEREFORE, BE IT RESOLVED, that the Commissioners Court of Tyler County, in regular meeting duly convened and acting in its capacity as the governing body of Tyler County, does hereby adopt the standards attached hereto as Exhibit A.

PASSED AND ADOPTED this the 13th day of September, 1994.

Jerome Owens
Tyler County Judge

ATTEST

Donece Gregory,
County Clerk
Tyler County, Texas

AGREEMENT FOR FUNDING OF ADDRESSING ACTIVITIES

This agreement is made and entered into by and between the DEEP EAST TEXAS COUNCIL OF GOVERNMENTS, hereinafter named as "DETCOG", and TYLER COUNTY, hereinafter named as "COUNTY".

WITNESSETH

WHEREAS, DETCOG has been designated as the Grantee pursuant to a Grant Agreement between the Advisory Commission on State Emergency Communications, hereinafter named as "ACSEC"; and

WHEREAS, COUNTY, desires to receive funding for addressing activities from the addressing pool funds established by ACSEC; and

WHEREAS, an agreement between DETCOG and COUNTY which permits COUNTY to receive funding for addressing activities as defined in the agreement between DETCOG and ACSEC has been authorized by the Executive Committee of the DEEP EAST TEXAS COUNCIL OF GOVERNMENTS and the governing body of COUNTY.

NOW, THEREFORE DETCOG and COUNTY, in consideration of the terms covenants and conditions herein, hereby agree as follows:

I.

DETCOG agrees to submit requests for reimbursement for addressing activities conducted by COUNTY and/or its subcontractor to ACSEC and to distribute the resulting reimbursement to COUNTY and/or the parties performing the addressing activity on the behalf of COUNTY.

It is agreed and understood that DETCOG's ability to reimburse COUNTY for addressing activities is limited wholly and completely to its receipt of funds from the ACSEC. In no event shall DETCOG be liable or responsible for the failure of ACSEC to fund addressing activities.

FOR AND IN CONSIDERATION of the foregoing, COUNTY agrees to undertake addressing activities in COUNTY in accordance with ACSEC'S directives and requirements and to submit, on a timely basis, requests for reimbursement for addressing activities appended by a narrative report detailing the progress derived from the expense of those funds. COUNTY further agrees, with each reimbursement request, to include the required 25% match, either in cash or in-kind.

1

II.

It is agreed and understood that the term "addressing activity" is defined as work associated with the initial inventory of a county for the purpose of rural addressing, conversion of USPS box and route numbers to street addresses, correction of existing address errors, notification to residents of new addresses, resolution of address assignment problems, and installation of new street signs.

III.

For and in consideration of the receipt of reimbursement for addressing activities, to the extent funds are available from ACSEC, COUNTY agrees to the following:

A.   Addressing activity costs eligible for reimbursement under the terms of this agreement shall be limited to only those direct, actual expenses as approved in the COUNTY budget worksheet which are associated with the following:

(1)   One time county inventory to assign new addresses:

a. Acquire county maps and street lists;

b. Identify county and private roads (named and (unnamed);

c. Identify areas needing addresses;

d. Establish address ranges.

(2)   Correction of existing address errors;

a. Identify and locate areas currently addressed;

b. Review address assignment between incorporated and unincorporated areas.

(3)   Conversion of postal route/box numbers to street addresses:

a. Identify new addresses matched to route/box numbers (to facilitate Post office conversion).

2

(4) Notification of residents with new addresses:

    a. Identify territory for phased address notification (in cooperation with Post Office);

    b. Specify or determine type of response from residents;

    c. Notify residents of new addresses.

(5) Resolution of problems in assignment:

    a. Establish inquiry, post notification, and address correction measures, including follow-up responses certifying final address.

(6) Installation of new street signs:

    a. Identify numbers of street signs required as a result of addressing project;
    b. Identify material necessary for sign installation;

    c. Purchase necessary signage material;

    d. Install signs.

(7) Maintenance of County Database

    a. COUNTY shall be responsible for maintaining an up to date addressing system.

    b. COUNTY will be responsible for designating a database liaison responsible for coordinating and communicating initial MSAG and MSAG update data to DETCOG 9-1-1 Database.

    c. COUNTY will be responsible for providing DETCOG 9-1-1 MSAG data and mapping culminating from rural addressing program in either digital or hard copy format.

    B.   In carrying out its activities under the scope of the Agreement, COUNTY shall comply with the terms and provisions of the Uniform Grant and Contract Management Act of 1981, as amended (Tex. Rev. Civ. Stat. Ann. art. 4413 (32g).).

C.   COUNTY shall refund to DETCOG any sums granted under the terms of this Agreement, which ACSEC determines has resulted in overpayment to the COUNTY, or which ACSEC determines has not been used by the COUNTY strictly in accordance with the terms and provisions of this Agreement. Such refund shall be made by the County to DETCOG within ten (10) working days after said refund is requested by DETCOG.

D.   COUNTY shall insure that adequate fiscal records and supporting documentation of all costs reimbursed under the terms of this Agreement are maintained, as appropriate, and in accordance with the provisions of this Agreement and applicable state law. COUNTY shall maintain such fiscal records and supporting documentation of all costs reimbursed until instructed by DETCOG that such records are no longer required and may be disposed of.

E.   COUNTY shall insure that DETCOG, and/or its duly identified representative has access to and the right to examine all books, accounts, records, reports, files and other papers or property belonging to or in use by the COUNTY, its subcontractors and/or any other authorized agents or agencies that have or will be performing addressing activity to be reimbursed under the terms of this Agreement.

F.   DETCOG reserves the right to withhold any and all payments otherwise due COUNTY under the terms of this Agreement if the COUNTY fails to submit to DETCOG in a timely and satisfactory manner any report required in this Agreement. If DETCOG withholds such payments, it shall notify the ACSEC, in writing, of its decision and the reasons therefore. Payments withheld pursuant to this provision may be held by DETCOG until such time as the delinquent obligation for which funds are withheld have been fulfilled by Grantee. If for any reason, ACSEC fails and refuses to make reimbursement to DETCOG for amounts submitted by the COUNTY, COUNTY agrees that DETCOG shall have no liability for such funds.

G.   DETCOG and ACSEC reserve the right to perform periodic on-site monitoring of COUNTY, COUNTY'S performing subcontractors, agent, or employee and/or any other authorized agent in compliance with the conditions of this Agreement. Following such a monitoring visit, if ACSEC provides DETCOG with a written report which identifies non-compliance with the terms and provisions of this Agreement, the monitoring report shall also identify requirements for the timely correction of such deficiencies by the COUNTY. Failure by COUNTY to take action specified in the monitoring report may be cause for suspension or termination of this Agreement.

H.   Any alterations, additions or deletions to the terms of this Agreement shall be amended hereto, in writing, and executed by both parties to this Agreement.

I.   If COUNTY, COUNTY'S subcontractor and/or any of its authorized agents fail to comply with any term or provision of this agreement, DETCOG may, upon

4

written notification to COUNTY, suspend or terminate this Agreement, in whole or in part, and withhold further payments to COUNTY, and prohibit COUNTY, COUNTY'S performing subcontractor and/or any of its authorized agents from incurring additional obligations of funds under this Agreement.

J.   Unless otherwise directed by DETCOG, COUNTY shall arrange for the performance of annual financial and compliance audit of funds received and costs reimbursed under the terms of this Agreement and including the Texas Uniform Grant and Contract Management Standards. COUNTY shall be liable to DETCOG for any costs disallowed pursuant to financial and compliance audits of funds received under the terms of this agreement.

K.   To insure compliance with addressing standards according to 9-1-1 and USPS requirements, DETCOG 9-1-1 will be permitted oversight monitoring of all addressing activities upon request by COUNTY at any time within the duration of this agreement.

L.   In entering in this agreement, the COUNTY, its subcontractors, and/or any of their authorized agents shall comply with all applicable state and federal laws to include, but not limited to, the following:

(1)   Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000 (d) and with the provisions of 45 C.F.R., Chapter 80;

(2)   Executive Order 11246 (Equal Employment Opportunity), 41 C.F.R., Chapter 60;

(3)   The Age Discrimination Act of 1975 (42 U.S.C. 6101 et seq.);

(4)   Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and the Americans with Disabilities Act of 1990;

(5)   Occupational Safety and Health Act of 1970 and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333), as applicable.

All such provisions of state and federal laws shall be complied with by the COUNTY to the extent such state and federal laws are applicable.

5

M. COUNTY, its subcontractors, and/or any of their authorized agents shall agree to the regional oversight by DETCOG to ensure that State standards are complied with.

VOL 029 PAGE 94

IV.

For and in consideration of the receipt of reimbursement for addressing activities, the COUNTY agrees to be responsible for identifying and reporting to DETCOG addressing activity expenditures to be reimbursed under the Terms of this Agreement. Such reporting and related reimbursement shall comply with the following guidelines:

(1)   Individual county project expenditures shall be reported by DETCOG on the Project Financial Report, (Form 911-ADRO2), Attachment "C", one form for each project.

(2)   DETCOG shall summarize all such reports (for all projects involved) on Grantee Summary Financial Report and Reimbursement Request (Form 911-ADRO2), Attachment "C".

(3)   Request for reimbursement and all supporting documentation shall be submitted to DETCOG no more frequenty that once a month. Said report and request shall be submitted to DETCOG by the tenth of each month for reimbursement by the end of the month involved.

(4)   Upon verifying that the addressing and associated costs reflected in the above reports comply with the terms of this Agreement, DETCOG shall be authorized to reimburse COUNTY for eligible costs identified in the "Grantee Summary Financial Report and Reimbursement Request Form". DETCOG shall be responsible for reimbursing COUNTY for their appropriate eligible project expenditures. However, such reimbursement is specifically contingent upon receipt of reimbursement by DETCOG from ACSEC.

(5)   COUNTY shall submit to DETCOG a "narrative progress report" identifying the progress by component, of each project described in Attachment "B", as of the date of each Project Financial Report. (A project "component" is defined as an enumerated addressing activity

6

identified in Article #3, [Pages 2 and 3], above).

V.

It is understood and agreed that, notwithstanding any provisions contained herein to the contrary, DETCOG'S financial obligation to COUNTY under this subcontract will not exceed the total amount of the grant funds obligated by ACSEC.

VI.

Final acceptance of the costs to be reimbursed and that are submitted by COUNTY are subject to monitoring by ACSEC and final acceptance of any costs submitted for reimbursement is subject to approval by ACSEC prior to payment.

VII.

This contract shall be effective from _13_ day of _September_, 1994 and shall extend through the _13_ day of _September_, 1996.

VIII.

Limitations on Liability

DETCOG is dependent upon receipt of adequate funds from ACSEC to meet its obligations under the contract herein. It is expressly agreed and understood that DETCOG shall not be liable for reimbursement of costs under this agreement if such funds are not furnished, for any reason, for ACSEC.

DETCOG shall not be liable for expenditures made in violation of rules, regulations and guidelines promulgated by ACSEC or any applicable state or federal law, regulation, rule, or guideline.

DETCOG shall not be liable for costs incurred by the COUNTY for performances rendered by COUNTY prior to the beginning date of this subcontract or after the termination date of this subcontract.

DETCOG shall not be liable for any costs incurred by the COUNTY for performances rendered by COUNTY or any subcontractor of COUNTY under this Agreement that has not been reported to DETCOG within sixty (60) days following termination of this contract.

IX.

COUNTY assures and guarantees DETCOG that COUNTY possesses the legal authority to enter into this Agreement pursuant to official motion, resolution or action passed or taken by COUNTY'S governing body.

X.

Any alterations, additions or deletions to the terms of this subcontract which are required by changes in ACSEC'S rules, regulations or federal or state law are automatically incorporated into this Agreement without written amendment and are effective on the date designated by such laws or regulations. It is agreed that this contract may be amended from time to time during the term of the Agreement by DETCOG issuing policy directives that serve, establish, interpret or clarify, performance requirements under this agreement. Such policy directives shall be promulgated by the Executive Director of DETCOG or his designee in the form of a written communication, which have the effect of qualifying the terms of this Agreement.

Except as specifically provided by this Agreement, any other alterations, additions or deletions to the terms of this subcontract shall be by written agreement, executed by both parties.

XI.

Either party may terminate this Agreement for just cause upon ninety (90) days written notice.

XII.

All notices required are permitted under this Agreement shall be in writing and shall be delivered when delivered in person or deposited in the United States Mail, postage pre-paid, return-receipt mail, addressed as follows:

COUNTY: Tyler County, Texas
Jerome Owens, Tyler County Judge
100 Tyler County Courthouse

Woodville, TX 75951

DETCOG: Deep East Texas Council of Governments.
           Mr. Walter G. Diggles, Executive Director
           274 Lamar Street
           Jasper, TX 75951

Such addresses may change from time to time by either parties by providing written notice in the manner set forth above.

This Agreement contains the entire agreement of the parties and there are no other promises, terms, or conditions in any other agreement whether written or oral. This Agreement supersedes any prior written or oral agreements between the parties, if any.

XIV.

This Agreement shall be governed by the laws of the State of Texas.

Agreed this ___13___ day of ___September___, 1994.

TYLER COUNTY, TEXAS

By:_____
     Authorized Representative

DEEP EAST TEXAS COUNCIL OF GOVERNMENTS

By:_____
     Authorized Representative

EXHIBIT "A"

ADDRESSING STANDARDS

ADDRESSING HANDBOOK FOR LOCAL GOVERNMENTS

DRAFT

STATE OF TEXAS
ADVISORY COMMISSION ON STATE EMERGENCY COMMUNICATIONS
REVISED 1991

ADDRESSING ADVISORY SUBCOMMITTEE

Bill Munn, Chairman
Rob Aanstoos, Texas Water Commission
Jim Brandes, Alamo Area Council of Governments
Mark Brown, GTE
Martha Castillo, Lower Rio Grande Valley Council of Governments
Doug Clough, Greater Harris County 9-1-1
Jim Copeland, Texas Department of Highways and Public Transportation
Horace Groff, Grayson County Judge
Pam Horne, Southwestern Bell Telephone
John Lucas, United Telephone
Kim Ludeke, TNRIS
Trudy Messick, U. S. Postal Service
Bob O'Neal, North Central Texas Council of Governments
Beth Ozanich, Tarrant 9-1-1 District
Jim Ray, Texas Association of Regional Councils
Gene Weatherall, Texas Department of Health
Jim Wetzel, Continental Telephone
Leon Willhite, State Property Tax Board

CONTENTS

Street addressing - a simple concept which is employed daily as travellers cross Texas communities on their way to homes and businesses. Yet hundreds of Texas counties lack addresses and are looking for information on how to assign street names and numbers. In 1989, this book drew together addressing information particular to Texas that could be put into the hands of those ready to do it. Two years later, scores of counties are on their way to addressing and this revised book presents information often requested by readers, such as:

- Addressing recommendations from a statewide addressing committee,

- Funding recommendations

- How-To Implementation section, and

- Expanded GIS descriptions

Addressing and 9-1-1

Physical location identification continues to be essential for public safety, specifically for Enhanced 9-1-1 emergency systems which must have addresses in order to display location along with the caller's telephone number. While complete addressing is not a prerequisite for installation of enhanced 9-1-1 service, the full benefits of selective routing and Automatic Location Identification (ALI) features can only be achieved with comprehensive address information. By 1995, Texans will be fortunate to have nearly entire statewide 9-1-1 service, many with E9-1-1 systems, and now addressing takes on new importance.

Addressing and Business

Aside from public safety reasons for addressing, the private sector benefits from street addresses for efficiency and profitability. Consider any business, such as freight delivery or a utility, that relies on street addresses for actual deliveries. As many business can confirm, difficulty in locating customers results in extra labor and fuel costs to the business.

4

Texas Addressing - Before 1989

Prior to 1989, most municipalities addressed their streets. However, in unincorporated areas where there were no addresses, the U.S. Post Office assigned rural route and box numbers in order to deliver mail. Areas in most need of attention are the unincorporated areas outside of city boundaries, where often there is no system of addressing.

Texas Addressing - Since 1989

The authority to set addressing standards was granted to counties in 1989 through S.B. 1091 which amended the County Road and Bridge Act. With this power, a county can determine how their communities are addressed. However, in order to achieve maximum compatibility between newly-assigned addresses and existing addresses inside neighboring city boundaries, addressing has taken on a regional impact.

With a comprehensive addressing program, providers of services--both private and governmental--reap economic benefits through improved use of employee time as well as the ability to utilize computer technology for location purposes.

Who Can Help Assign Texas Addresses

Assigning addresses is not for an individual jack-of-all-trades person, rather, it requires a many individuals who will be impacted by addressing such as the cities, the Post Office, and others. An addressing project involves several decisions to be made, such as the geographic area to be included, the selected method for street naming and number assignment, and the extent of participation with multiple users.

Address assignment affects many government and private services in an unincorporated area. At minimum, assigning addresses where rural route boxes formerly stood will impact the U.S. Postal Service and residents. Changing or adding addresses can create problems or help smooth mail delivery depending on how much coordination takes place. The Handbook encourages the participation any party who can offer technical assistance in the design of an addressing program so that the community is better prepared to make subsequent technical decisions.

A representative community group can help:

- **Identify Common Needs and Goals** - Users can decide what an address project can do for local governments and other users based on mutual needs.

- **Share in Project Costs** - Users, as a group, can decide what addressing and mapping methods can reasonably be afforded and obtain or share the necessary resources.

- **Provide Technical Assistance** - Users can contribute first-hand knowledge of addressing methods and procedures. They are also instrumental in facilitating change in the community.

Addressing Goal and Objectives

The primary goal is to provide a complete set of addresses for the service area in support of the 9-1-1 enhanced system needs. The objectives are

- to make the address information compatible with the needs of the Post Office as well as telephone companies' computer programs and,

- to develop a method for continual maintenance of the addressing program, and effectively implement the use of new addresses.

The following chapters provide the fundamentals for an addressing project, first by describing statewide addressing recommendations and, second, by bringing in specific information to assist in addressing steps. For more quickly understanding terms, a brief glossary defines those terms used throughout the text.

With the diversity of Texas communities and local governments, there can be no single "best way" to address. There are, however, some general principles as well as specific standards and techniques that have proved to be applicable in most situations and these are included.

CHAPTER 1   A Primer On Addressing

For newcomers to addressing, this section introduces the subject and choices typical to an addressing project. A common thread running throughout this book is the importance of interagency cooperation. Interagency cooperation is not a foreign idea; local governments typically provide emergency services through mutual aid agreements, an important form of cooperation. Addressing needs that same cooperation to make it successful within a county.

A rule of thumb in selecting your addressing scheme is the following.

- Addressing must be easy to recognize and locate,

- Useable by local governments, the Postal Service, and utilities,

- Installed and maintained affordably.

If addressing follows the above rules, it will. . .

- help locate calls for emergency services,

- offer recognition when giving directions for public use, and

- create greater efficiency through consistent use of one address for postal delivery and commercial services.

What Constitutes a Good Addressing System?
The common denominator for an effective addressing system is can it be understood and used accurately for public safety and by the general public. If it cannot meet this test, more than likely it will create confusion and defeat the intended purpose.

Starting an Addressing Project -- Organization
A planning or steering group has been instrumental in most addressing projects in Texas for the primary reason that they provide technical expertise and coordination

7

with affected agencies. These groups can identify and develop financial and technical resources to carry out the project.

And, based on the newly-gained legal authority for counties to adopt addressing standards, it is recommended that a planning group be initiated or recognized by respective counties prior to starting an addressing program so that addresses may avoid legal challenge.

A planning/steering committee ideally includes the following organizations within the county:

> Regional Council of Government

> 9-1-1 Districts
> Emergency Services

> Post Office

> County and city planning/engineer staff
> Neighborhood Groups

> Central Appraisal Districts
> School Districts

> Telephone Companies
> Gas and Electric Utilities
> Cable Television

8
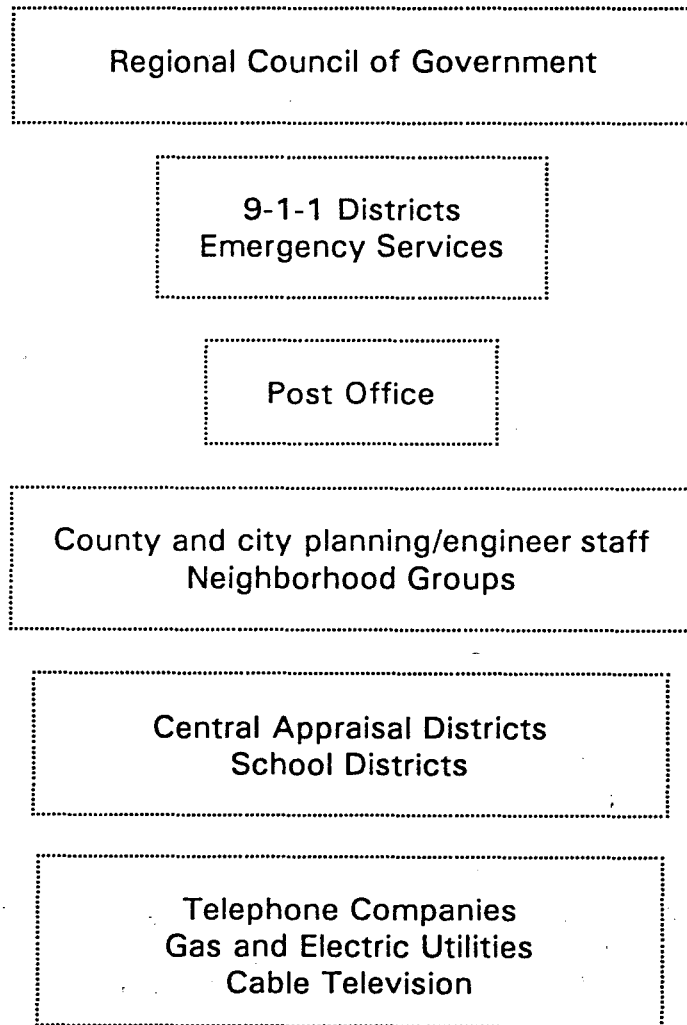
Each project is unique and must be tailored to a community's existing organizational capabilities, resources, and geography. As examples, the committee could be expected to:

- Develop specific written objectives as to organizational responsibilities and methods for implementation,

- Establish a workplan and timetable,

- Develop a project budget,

- Identify sources of direct financial support and in-kind assistance,

- Periodically review progress and problems encountered, and

- Assist through their respective organizations in implementation (e.g., mapping, address assignments, notification, installation of signs and markers, and maintenance of the system).

Local Addressing Standards

The standards to guide address numbering and street names need to be developed as part of the planning process. Examples of standards that have been used by Texas cities and by other rural addressing projects are contained in this handbook. There are some general principles such as consistency, simplicity, and non-duplication evident in all the examples cited. But more specific decisions need to be made on items such as address ranges, block lengths, street/road designations, and procedural questions such as approval authority.

Within city boundaries, standards may have already been adopted by ordinance. These standards apply within the city and may also apply within the city's area of extraterritorial jurisdiction, if the city has extended its subdivision regulations to that area under authority of Chapter 212 of the Local Government Code. Outside city limits, counties may adopt standards for addressing under Section 2.011 of the County Road and Bridge Act (Art. 6702-1 V.A.C.S.).

From a legal policy standpoint, it would be appropriate for the planning or steering group to reach an agreement with the appropriate commissioners court(s) regarding its plans to submit recommended standards and specific address assignment plans for unincorporated areas. Once the addressing standards and plans are developed, the commissioners court may adopt them by order under the provisions of Section 2.011 of the Road and Bridge Act.

Implementation

The time needed to implement a typical county addressing project can range from six months up to several years. A good portion of this time will be occupied by planning and address mapping tasks. Staffing arrangements for past projects have drawn upon public service staff, university interns, and volunteer service organizations, among others.

Project costs will depend on the number of properties to be addressed and the automation or database needs. For undeveloped areas with few properties to address, costs may be minimal. However, for addressing projects dealing with a large volume of properties and with high expectations for mapping products, the costs can be expected to be greater for items such as computer memory expansion and software. Texas is seeing more joint government addressing projects for at least one reason that costs can be offset by having more than one user.

Probably the most critical system tools are maps and procedures for locating parcels and structures in the project area. The central appraisal district will likely have maps at a suitable scale for this purpose, and they may even be available in digital form. County government maps, if available, are typically prepared for road engineering and road maintenance. The State Department of Highways and Public Transportation (SDHPT) also uses county maps, some of which are digitized and of a scale suitable for addressing purposes. The SHD maps, while useful, are not current for all counties, and these may need supplemental aerial photography.

ADDRESSING TIMELINE
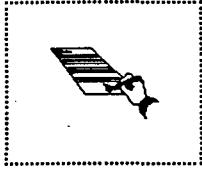
I. PHASE ONE

1st - 2nd Month

<u>Who</u> - County Commissioners Set Standards and Adopt Plan

    Select Addressing Leader and Make Appointments to Committee

    Leader Includes Participants in Initial Planning Meeting:
        Cities, Post Office, School Districts, Telcos,
        Emergency Services, Utilities, Neighborhood Groups

    Establish Entity who will Maintain Addressing

    Estimate costs and how they will be paid

<u>When</u> - The time addressing should commence and be completed.

    For E9-1-1, list telco critical dates for addressing purposes.

<u>What</u> - Necessary resources for the Addressing Team are <u>leadership</u>, personnel, maps, and address maintenance method.

    Prepare to educate local public on the need for addresses and their role in assisting the project through meetings and printed materials.

II. PHASE TWO

3rd - 9th Month

Work Plan - Analyze and construct the plan that fits the county and then share with affected agencies, such as post office.

Inventory entire county area - Collect maps and assign principal task to identify all roads, named or otherwise in order to establish an alpha listing whereby duplicates can be revealed. Identify what areas do have addresses and which ones don't, both incorporated and unincorporated.

Create land base map - After the above, select a local review team to ascertain the map is complete. Finalize road name changes where necessary.

III. PHASE THREE

10th - 15th Month

Number Assignment - Select one numbering method and apply to unaddressed areas. Plan accordingly for storing the numbers assigned in a pre-determined format. Follow-up number assignment with notification to occupants and verification. Include Problem Resolution strategy.
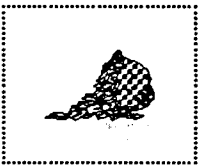
IV. PHASE FOUR

16th Month Forward

Address Maintenance - Implement maintenance system with county or other chosen office that includes continuing address issuance, problem resolution, map generation, and special products which may be needed locally.

ADDRESSING PROJECT CHECKLIST

I. PHASE ONE
1st-2nd Month

_____ County Commissioners adopt Addressing Plan

_____ County Commissioners adopt Addressing Standards

_____ Select Addressing Coordinator

_____ Identify possible Addressing Project Participants

_____ Make appointments to Addressing Committee

_____ Identify entity that will coordinate Address Maintenance

_____ Estimate Addressing Costs

_____ Identify possible Funding Sources

_____ Determine timeline for Project Completion

_____ Determine how timeline fits Critical Telco Dates for E9-1-1

II. PHASE TWO
3rd-9th Month

_____ Determine needs of all participating entities

_____ Develop work plan

_____ Identify Mapping Resource

_____ Identify all roads and establish alpha listing

_____ Identify any duplicate street names

_____ Identify all areas with and without addresses, including cities

_____ Review map contents

_____ Finalize any road name changes as needed

13

III. PHASE THREE
10th-15th Month

_____ Select one house numbering method and apply to unaddressed areas

_____ Develop method for Problem Resolution

_____ Determine format and method for storage of assigned addresses

_____ Address Assignment

_____ Determine method for Address Verification

_____ Determine method and timeline for Address Notification

_____ Develop Addressing Public Education program for citizens

_____ Distribute maps to Emergency Service Providers

IV. PHASE FOUR
16th Month Forward

_____ Implement maintenance system with chosen entity

_____ Determine method for issuance of new addresses

_____ Determine method for problem resolution

_____ Provide for generation of map product

_____ Determine county need for street signs

_____ Consider any other county specific problems with regard to addressing

14

CHAPTER 2   Actors In Addressing

Knowing the actors in addressing helps develop an intergovernmental approach to addressing. Knowledge of the actors and their programs, legal authority, and resources early in the planning process goes a long way in making effective organization and implementation decisions during the addressing project. Actors in this section carry out one or more of the following functions:

- active involvement in assignment of addresses or development of addressing programs,

- maintain databases and maps that are useful to addressing, and

- use the address information in carrying out their business.

Local Governments

Municipalities. Cities have broad legal authority to carry out addressing. Without addresses, many basic city services would be undeliverable. Cities are authorized by Chapter 51 of the Local Government Code to adopt ordinances, rules, and regulations that are necessary for the government and commerce of the municipality or to carry out other powers granted by law. Home-rule cities may generally adopt any ordinance that is not prohibited by the constitution or general laws. Also, cities have substantial authority under subdivision regulation statutes (Chapter 212 of the Local Government Code) to adopt general rules governing plats and the subdivision of land.

Municipal addressing generally extends to the city's boundaries, however, the municipality may extend its subdivision rules to the area of extraterritorial jurisdiction. This may result in the city addressing standards being extended to a contiguous area outside the city's boundaries. The width of a city's extraterritorial jurisdiction is determined by population size. Under Chapter 42 of the Local Government Code, extraterritorial jurisdiction is determined as follows:

Population	ETJ = This Distance Outside Boundaries
less than 5,000 pop.	one-half mile
between 5,000 and 24,999 pop.	one mile
between 25,000 and 49,999 pop.	two miles
between 50,000 and 99,999 pop.	three and 1/2 miles
100,000 or more pop.	five miles

In many of the Texas addressing projects, the addressing system of the largest city in the county has provided the basis for addressing the unincorporated areas in the remainder of the county.

Counties. County government in Texas has the principle task of overseeing the road system. A number of Texas counties have adopted road numbering plans and some have developed addressing or location identification systems for road engineering and maintenance purposes and to facilitate emergency services and other county business. The earliest addressing was initiated by the 9-1-1 districts and now counties have come into their own by initiating addressing.

The County Road and Bridge Act (Article 6702-1, V.A.C.S.) provides broad authority for laying out, constructing, and maintaining public roads, and the ability to adopt rules or standards regarding addressing system is probably implied by this authority. The Texas legislature, however, clarified this issue in the 1989 regular session by enacting S.B. 1091, which adds Section 2.011 to the County Road and Bridge Act. A copy of this bill is included as page ___ of the book.

Section 2.011 accomplishes two purposes. It clarifies that a county's adopted standards must be followed in new subdivisions and is for use by any entity that assigns addresses in unincorporated areas. It also allows the commissioners court to identify areas where addresses are needed and to make the appropriate address assignments and name the streets or roads. The municipal standards prevail if there is a conflict in the area of extraterritorial jurisdiction.

Central Appraisal Districts. The Texas Property Tax Code established a central appraisal district in each county to appraise all taxable property and to provide values to each taxing unit in the appraisal district. Today, there are 253 appraisal districts with a separate district in each county except for Potter and Randall Counties which are combined. Appraisal districts are governed by a board of directors selected by the taxing units within the district, such as cities and schools.

A complete set of maps is necessary for each appraisal district to locate, record, and appraise all real property (Subchapter 155.2, Texas Administrative Code). The maps

16

may contain information pertaining to the legal identification of the parcels, appraisal data, street address, property lines, easements, as well as other information. Other records they retain are for property ownership, location, value, and other data which can be useful in developing an addressing system.

Appraisal district records usually include physical address information for each parcel, along with other data, if the physical address information is available. Appraisal district maps and records have proved a valuable resource for several addressing projects in Texas counties, as illustrated in the project descriptions for Tarrant, Smith, and Lubbock Counties later in this handbook. There are considerable differences in districts's basic records systems, mapping systems, and procedures for maintaining the systems.

Maps are maintained by appraisal districts to ensure that all real property is inventoried and the addressing process has helped reveal property missing or incorrectly assessed as to land use. This has, on occasion, revealed additional tax revenues for the district.

Emergency Communication Districts. While most counties are familiar with regional 9-1-1 systems, countywide 9-1-1 emergency communication districts were pioneers in 9-1-1 operation starting with Harris County in 1983. A similar statute was enacted for Tarrant County in 1984, and all counties over 75,000 population were authorized to establish 9-1-1 districts in 1985. The population limit authorizing countywide districts was lowered to 20,000 in 1987, but the creation of new districts was prohibited after January 1, 1988. In all, 25 separate districts were established under the legislation. The relevant legal provisions pertaining to countywide 9-1-1 districts are contained in Chapter 772 of the Health and Safety Code.

The 9-1-1 districts have been instrumental in establishing a rural addressing program for the areas served by their emergency communication system. Most of the districts have implemented or are planning to implement enhanced 9-1-1 with automatic location identification (ALI) features. Of course, prerequisite for ALI operation is a reliable system of addressing throughout the area covered by the 9-1-1 system.

Regional Councils of Governments. Regional councils are voluntary associations of the local governments located within each of the state's 24 multi-county planning regions. Their governing body is composed primarily of local elected officials. While their names vary, with some called "planning commissions" and others are named "development councils," their statutory authority and basic operation are the same. Regional councils are established under Chapter 391 of the Local Government Code, which provides broad authority to conduct planning for the region and to participate in cooperative projects with member governments.

Regional councils are capable of assisting in addressing, such as Capital Area Planning Council for central Texas counties. As administrators of the regional 9-1-1 plans, regional councils work with local governments and emergency service providers toward 9-1-1 service start. Several regional councils provide mapping services and develop comprehensive plans for communities in their regions. Also, some councils develop extensive computer data files, and several have recently acquired computer mapping and geographic information system capabilities.

State Agencies

Advisory Commission on State Emergency Communications (ACSEC). The ACSEC is responsible for the implementation of 9-1-1 service. The Commission has approved regional plans developed by regional councils of governments under Chapter 771 of the Health and Safety Code, and it allocates money where necessary to assist in preparing and implementing 9-1-1 systems.

The ACSEC, after reviewing for cost effectiveness and appropriateness, monitors that plan in the establishment of statewide 9-1-1 service. State law requires that regional plans for 9-1-1 service include automatic number identification (ANI), a feature that displays the telephone number of the caller automatically when a call is received. Automatic location identification (ALI) is a feature that displays the caller's address when a call is received on a 9-1-1 system. Regional plans may include ALI, however, if this feature is financially feasible within the 50 cent maximum access line charge that is allowed for implementation and operation of regional plans.

As ALI becomes feasible in regions of the state, addressing programs will need to be undertaken in conjunction with 9-1-1 implementation in these areas. In these cases, proper planning and scheduling of necessary addressing projects will be important for the effective operation of the 9-1-1 system.

During preparation of regional 9-1-1 plans, the lack of addressing became apparent and the Commission directed the preparation of an addressing handbook, published in 1989. This book, now revised, is designed in response to requests for assistance to regional councils and local governments in carrying out the addressing. At the request of regional councils, a year later the ACSEC approved an addressing program that sets aside a small staff to assist regional councils and counties in addressing. Other programs include technical assistance and training for regional council personnel in 9-1-1 plan implementation.

This Handbook on addressing for local governments is a continuation of ACSEC efforts toward assisting in the implementation of appropriate and cost-effective 9-1-1 service statewide.

18

Texas Natural Resources Information System (TNRIS). This state agency is known as the primary clearinghouse for maps and natural resource data for the state, for universities, for governmental units, and the private sector. Whether maps or materials on file or available from other agencies, state or federal, the TNRIS staff is a central resource to be used. Materials and methods of accessing them include remote-sensed data, aerial photography, and other satellite imagery. The TNRIS serves as a distribution center for U.S. Geological Survey maps. A recent focus of TNRIS is on computer mapping and geographic information systems. Future activities will probably include technical assistance and training on these systems.

Texas Department of Information Resources. This new state agency is active in data and map exchange among state agencies that will impact what may be available to local governments in the future. While it primarily works on evaluating state government's major computer designs and acquisitions, information management and geographic information systems (GIS) are areas of expertise within this agency.

The State Department of Highways and Public Transportation. Working through its 25 district offices providing state highway construction and maintenance, the Department also is the major state player in mapping each county. Because of its local presence, the Highway Department district offices are interested in local addressing and have offered help in sign installation and map acquisition. The Department recently introduced a new reference marker system that measures state highways from county line to county line, assigning latitude and longitude coordinates using satellite technology.

The Texas Department of Public Safety This agency regularly collects and analyzes statewide traffic violation and accident data which relies heavily on specific geographic location data. DPS launched a new computer program to augment its traffic safety responsibility. Called the Law Enforcement Administrative Decision System (LEADS), this program collects statewide occurrences of accidents and violations and the time and location of each, all of which will ultimately form a specialized GIS.

19

Federal Agencies

U.S. Postal Service. The nation's primary mail carrier, this Post Office prepares local delivery routes and sets address display standards for use by the public. The Postal Service has two types of delivery systems: city delivery and rural route. Recently, instructions were issued to postmasters to consider in new addressing projects and the conversion from route and box numbers to physical addresses.

Local postmasters have some flexibility and discretion in the conversion process. This is generally a local decision, and in some situations, the department's budget may limit its cooperation in implementing a local addressing project.

The experience of most Texas addressing projects indicates that local postal units have been cooperative in the addressing process by assisting in the verification of locations for assignment of addresses, assisting in customer notification, and adopting address systems when complete. Conversion to addresses is particularly helpful to post offices in areas that are growing in population. New addresses eliminate the need to change route and box numbers as postal routes are realigned in response to population changes.

Generally, postal route maps are maintained by local offices and may be used as a resource in local addressing projects. This underscores the importance of working closely with the local postmasters in the area from the very beginning of a project.

Most local departments would not adopt an addressing system for mail delivery that is cumbersome or difficult to understand. National standards do exist for address format to assist in utilizing ZIP+4 and other features such as optical character readers. A list of standard abbreviations for street designators and suffixes (Avenue = Ave, etc.) has been prepared.

Bureau of the Census, U.S. Department of Commerce. This agency's data is typically more visible than the agency itself due to its mission: to collect population data through its decennial census. Census needs and uses available street addresses to distribute census questionnaires as part of their data collection. The agency then shares their population data with local governments in the form of population counts and population descriptions within each geographic unit.

The Bureau's interest in addressing is tied directly with enhancing the information they will collect during the 1990 and the 2000 census from Texas. Addresses and the use of digital mapping has improved the technology available to the 1990 Census. Census products will include county level maps which provide detailed street and address range information within major urban boundaries and general features such as roads and hydrographic data in the remainder of the county.

20

Utilities

Physical location information continues to be as essential for utilities as for emergency service providers. Providers of electricity, gas, and telephone services require maps and reference systems for installation and maintenance purposes. Some prototype addressing systems in the state were developed by electric utilities, and in at least one metropolitan county, the electric company actually assigns the addresses for subdivisions and new structures. The address assignments are accepted and used by local governments in the county for general purposes.

More than 60 independent carriers operate in local areas covered by 9-1-1 services, many already familiar with the use of customer data bases for 9-1-1 purposes. In areas of the state where address projects are undertaken, the electric cooperatives and other utilities serving unincorporated areas may be able to provide maps and address lists that are valuable for cross-checking locations and in some cases, locating customers that would otherwise not be identified.

◘ Addressing Advisory Subcommittee Recommendation ◘

Role and Authority

> **1.** **Commissioners court and city council(s) should set official addressing standards prior to addressing and a county addressing contact should be designated. Addresses assigned by a county are recognized as official addresses.**

a. The addressing contact should issue one street address per inhabited unit which will serve as the physical location address for emergency services, public services, and postal delivery.
b. The addressing contact notifies appraisal districts, utilities, and others of new or changed addresses at an official step such as in water/sewer permitting or plat approval.

Addressing authority resides with cities, under the Local Government Code, and counties, under the Road and Bridge Act, all under state statute. Orders, resolutions, and ordinances serve to stipulate addressing standards and procedures for street naming and number assignment.

> **2.** **Addressing Standards should be developed with at least the U.S. Postal Service, the central appraisal district, cities, and utilities as users of addresses.**

a. County standards should specify property address signs, location, and enforcement.
b. Residential street numbers should be posted at street access point to property for emergency services.

Addressing a county will necessitate replacing postal route and box numbers with street addresses. And for city- addressed property which falls adjacent to unaddressed areas, street number and naming should strive to be as consistent as

possible. Address changes will impact entities which provide property taxing services and utility services.

By including these items, the pitfalls of public misinformation can be avoided.

3.   Maintaining an addressing system should be an ongoing function of a county or its appointed addressing contact.

a. As property is subdivided and growth occurs, addresses need to be maintained permanently by the county and updated <u>often</u> to emergency service providers for any street name or numbering changes. If a utility receives a service request without a street address, the customer should be referred to the addressing contact to obtain the correct address promptly so as not to hinder utility service start.

b. Maintenance by the county addressing contact will require a map that displays unincorporated areas with street names and numbers and if possible, incorporated area addresses. As subdivision occurs, developers should be notified of addressing choices for names, numbers, and sign posting. Where map books are used by emergency services and businesses, revised inserts need to be distributed. Compliance with posting property signs can be encouraged through public education.

4.   Should counties elect to have third-parties contract for addressing, the county addressing standards should be followed.

Counties retain responsibility of addressing standards and notification.

CHAPTER 3   Road Naming and Street Numbering

1.   Citizen participation should be included during development of standards and street name assignment.

a.   Where street name changes are required, street residents may select name substitute.

Opportunities for citizen participation and suggestions in the entire addressing project allows neighborhoods to make some local choices and should be encouraged to promote use of new addresses.

2.   Street names within a county should be inventoried to identify and eliminate duplicate names. Community participation in street naming is encouraged. Procedures for future name changes should be set.

First, street name change criteria should be agreed upon for any current or future changes. A name change which results from the addressing project should be presented to residents and name choices given. Future name changes should ideally be entertained only for emergency services reasons or to commemorate notable persons. Name changes may create extra costs to business and these should be considered prior to final decisions. Duplicate street names left unchanged or undetected will lead to errors in service delivery.

3.   Street name and number field should be limited to 40 characters, six characters for number.

Field lengths are restricted by the U.S. Postal Service and telephone companies.

Punctuation allowed by the Postal Service within the street number and name should normally include only periods, slashes, and hyphens.

> **4.** Each street should have one legal name only as designated by city or county. Avoid sound-alike names or names that indicate a direction.

Sound-alike names create confusion when dispatching emergency services, e.g., **Beach Street**and **Beech Street**. **North Court Street** can be misinterpreted to be N. Court Street.

> **5.** A named street should be continuous throughout its length. Caution should be given to naming and numbering roads based on its location in a county precinct; precinct boundaries may change.

a. Intersections should not disrupt a street name except in instances where city streets continue into county areas and the county has named the street differently.
b. Numbering along a continuous street should be sequential.

> **6.** Public-maintained roads and private roads are recommended to be named and signed for mapping purposes in the following way.

This is not to say that by providing a name or sign to a road, public maintenance of the private road is mandated.

Private roads with multiple residences should be named and numbered off of the private road.
For others, property should be numbered off the public road. For counties not providing names to private roads, property should be numbered off of the public roads.

Street Numbering

Establish one street number per residence in a city-style numbering system. Numbers should be sequential with even and odd numbers on opposite sides of the street.

a. <u>Caution:</u> Numbering based upon moveable boundaries (i.e. county precinct lines) will cause inconsistent numbering as population grows or moves in a county and city or precinct lines shift to accommodate it. This should be avoided.

A numbering system built on relatively small intervals (5-10 ft.) provides adequate numbers in developed areas. If land is largely unsubdivided, intervals may be larger, such as 50 to 200 foot intervals. The equal interval approach allows future subdivisions and roads to be fitted within the established numbering system.

Multi-unit structures, such as apartment groups, should use individual numbers with unit designations as 103 Beech Apt 201.

For a multi-unit apartment complex, the property would be assigned its street number and unit number. If building and unit number combinations are used, each unit number should be unique, such as Apt 201 (building 2, unit 01) Some telephone companies do extract the unit number, while the U.S. Postal Service prefers not to use it in the address field.

Corner addresses, such as 12th and Trinity Street, should be replaced with a single street number and name, 1105 Trinity.

9-1-1 and the U.S. Postal Service require a singular address for physical location.

26

State highways should be recognized by their numeric name.

a. Where considerable history or distance dictates, a single community name for the highway should be used.

CHAPTER 4 Addressing and Databases

With an addressing project, a database of new addresses is created or data is added to an existing database provided by some other entity, such as an appraisal district, 9-1-1 district, public works/planning department (county or city), or utility. The project planning group must identify the data type and format needs. This means identifying the proper fields of information, the largest unit of a database for input in the database. The particular software used will dictate how much information (characters) can be contained in each field.

To assign addresses and store them for future update, a database management program or manual listing system should be selected that can handle the task. To get a ballpark estimate of how many records or entries will be handled, determine the total parcel numbers within the address area on file by the appraisal district. In addition, some telephone companies can print a listing of unaddressed customers. Once addresses are assigned and are verified, they are ready to be entered into the database.

Basic fields

At minimum the fields needed to be retained are property parcel number or equivalent identifier number, new address assigned, phone number, and zip code. If the database is for 9-1-1 purposes, refer to telephone companies serving the area for data and format requirements.

If other information is desired, is accessible, and can be useful in addressing objectives, consider adding the following: zoning status, voting precincts, school district boundaries, utility routing (water, sewer, etc.), other county/city public works items. These files do not necessarily have to be added to the database. They can be stored separately for retrieval.

Next, specify the applications this database will produce: special reports for each user, mailing labels, zip code and other boundary breakouts, among others.

Utilize or "borrow from" an existing database

It may be possible to shorten this process of entering data for use in the address database. Tax appraisal districts and local telephone companies have property owner and customer listings, usually on a database. The appraisal district records are not proprietary while the utilities' records usually are and access to either may require negotiations. This list is useful to the number assignment process, particularly the printout as a ready-made list to verify entries.

Remember that in using data used from "outside" sources, old addresses need to be verified to retain purity in a database.

Maintaining Address Systems

Once new addresses are assigned, a new list or database is created. When starting a project, the project working or steering group may have been composed of volunteer or temporary staff. But in order to guarantee that the address system is kept up-to-date, an on-going maintenance responsibility needs to be assumed by an appropriate body.

Maintenance activities will include:

- Obtaining utility service connections in order to add new service locations.

- Monitoring county and appraisal district records for new subdivision plats. Monitoring municipal annexations and other development showing new thoroughfares. Assignment of addresses as needed.

- Answering citizen address inquiries, correcting occasional address errors, and representing the address system to other users.

- Updating data on a periodic basis in order to generate accurate reports to users.

- Securing database by backing up the system to ensure the master file is stored away from hazards or loss.

These tasks are of great importance in the maintenance of an address system. One of the steering or working group participants may be the choice to maintain this system or the administration of these tasks may be divided among participants. This portion of the project can be established via contract for fee or as in-kind services.
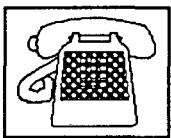
The Value of the Database

The database will have a monetary value to the private sector. With the exception of perhaps utilities who may have shared project costs in exchange for future information, some communities are considering the marketability of their databases to help recoup development costs. For government, only reproduction costs can be recovered.

Public Access to Data

Public information collected by governmental bodies is generally available to the public unless specifically exempted under the Open Records Act or by judicial decision (Article 6252-17a, Sec. 3(a)(1), V.A.C.S.). Public information is any information collected, assembled, or maintained by governmental bodies in connection with the transaction of official business (Sec. 2).

In February of 1989, the Attorney General interpreted the Open Records Act as it pertained to the release of a recording from a 9-1-1 emergency call (Open Records Decision No. 519). Part of that interpretation held that public records were subject to the Open Records Act even if the information is held by a special district such as a 9-1-1 district. The key here is to know if any data has been defined confidential or otherwise exempted from this act and to know what laws protect distribution of that information. The Open Records Act is, by law, liberally interpreted to make most government information available to the public.

One of the more immediate users of new addresses will be the 9-1-1 emergency system database. The database for a fully enhanced 9-1-1 system, which allows call identification by location, uses three central computer files: the telephone number records file, the address records file, and the Master Street Address Guide (MSAG) which is a file containing street address ranges associated with emergency service numbers (ESN). Each ESN represents a specific combination of law enforcement, fire, and emergency medical service respondents.

A match must occur for these three files to display the location information on the Public Safety Answering Point (PSAP) screen where the call is received. Therefore the street addresses must be prepared accurately and be compatible with the database to ensure the routing of calls within the system. Database managers with the 9-1-1 districts and with the local telephone company can provide specifications needed for their particular system configurations.

Master Street Address Guide (MSAG)

As one of the primary files upon which the 9-1-1 database relies, the MSAG must have accurate and current service area street names and number ranges in order to operate properly. A 9-1-1 system relies on telephone companies for the customer service address information and that information must match with an address in the district's MSAG.

The base for most MSAGs is the telephone company service address data. This data is supplemented by telephone companies' ongoing service records updates and by other address sources in order that all block ranges are represented properly.

Community names are also captured so that emergency service number (ESN) boundaries for emergency services which have been assigned can be included in this file.

Not only does address data need to be verified upon entry and when any change in emergency service coverage occurs, the emergency service numbers assigned to particular areas may undergo changes. If a street is added to a community, or if it undergoes a name change, or if the street is further developed, it is possible to impact the MSAG quite dramatically. Databases should have automatic verification reports to reveal the exceptions where addresses do not match and need prompt investigation. With information being captured from perhaps two or more sources, it is imperative that data be compatible with the format being used by the 9-1-1 district's database. Street and community names should fit the field length of the district's database and abbreviations should be standardized.

Recommendations for Standardized Data Exchange

Data interchange is fast becoming a necessity between levels of government and, if addressing uniformity can facilitate interchange, this is a chance to start. The following is a minimum format of address information for interface in retrieval. As new addresses are established during the upcoming months, this standard format is provided as a format. The criteria applied to selecting a format are as follows:

★ to establish a standard format compatible with frequently-used information, primarily street name and number character lengths, ranges, position, abbreviations in use with the Postal Service

★ hierarchy used to designate the following:

1. MSAG
2. 9-1-1
3. Map

Proposed MSAG Record Format

Field Length (Bytes, Alpha-Numeric)	Description
Prefix-Directional, 2, AN	Street direction prefix; left justified with trailing spaces. N, S, E, W, NE, NW, SE, SW
Street Name, 40, AN	Street name; left justified with trailing spaces
Street Suffix, 4, A	Street type - Avenue, Road, Post Office abbreviations
Post-Directional, 2, AN	Street direction suffix; e.g. North St., SW
Low Range, 10, AN	Lowest house number in specific address range; left justified with trailing spaces

32

Field Length	Description
High Range, 10, AN	Highest house number in specific address range; left justified with trailing spaces
Community Name, 32, A	Valid community name of the street/house number range, left justified w/trail. spaces
State, 2, A	Alpha state abbreviation (e.g. TX)
Odd/Even Number, 1, A	Whether range defined odd, even, or both; O = odd, E = even, Space = both
ESN, 5, AN	Emergency Service Number to be assigned to the street defined within the house number range specified.
County I.D., 4, AN	Identification code (usually FIPS code) of the County for specified house number range.
Exchange Code, 4, AN	Telco code identifying the telephone exchange that serves the specified street and range.
TAR Code, 4, N	Tax area number for specific house number range.
Map Reference Code, 24, N	MSAG future use for hazardous materials
Point Location, 15, AN	XY coordinate for point
XY Coordinate - Address	Digital map location point identifier.
XY Coordinate to (line segment)	
XY Coordinate from (line segment)	

◘ Addressing Advisory Subcommittee ◘

Recommendations on Mapping Software

Capabilities

<u>State Base Map</u>
|
<u>TIGER Accessibility and Update</u>
|
<u>Graphics Import/Exportability to Government and Telcos</u>
|
<u>County Address Range Location</u>
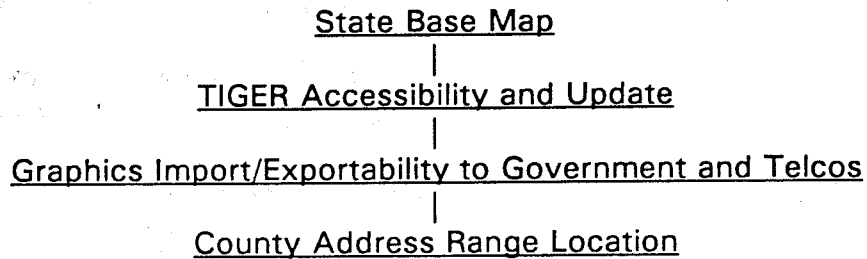
Software

Graphics   ★   Allows reading of TIGER, update to TIGER, and import/export of TIGER data.

★   Secondary considerations for specific use with local governments, such as county, appraisal district, cities, and others.

★ Update capability.

Hardware

As appropriate to support application.

CHAPTER 5 Funding

Funds for Addressing

Street addressing and street signs are a public service whose responsibility falls upon the shoulders of local governments. However, arranging financial support for this service has been done successfully with the help of local business and community groups. Most addressing projects received funding because of the following:

1. An addressing plan was prepared.
2. County commissioners supported it with funds and or staff.
3. Community involvement.

For counties who may not have immediate access to funds, it is possible to start the planning phase of addressing. For many projects in Texas, this is the only way to make progress in addressing.

Regardless of how an addressing project is funded, a plan must be in place to explain what needs to be done and the estimated cost. Common items in such a plan are (1) setting local addressing standards, (2) projecting number of properties needing addresses and (3) estimating personnel and equipment needs. Potential contributors expect this information before committing their money.

With estimates in hand, the next task is to identify who has the resources the county may need or want to cost-share in. Money, people, vehicles, postage or equipment can be found at sources such as the following:

- school districts and PTA
- all utilities
- delivery services: Central Freight, Federal Express
- charitable foundations: local/regional, Meadows, Moody, Richardson
- service organizations: Lions Club, Jaycees, United Way,
       League of Women Voters, Junior League

These groups, and individuals, convinced of the public safety value of 9-1-1 can be asked for their commitment to help at whatever level.

The Advisory Commission on State Emergency Communications continues to search for funds to support local addressing and has located initial funds for 24 counties through the Local EMS fund operated by the State Highway Department. As information becomes available, this is communicated to the regional councils of government and through the 9-1-1 Caller. Promotional materials for local addressing presentation to groups can also be provided by contacting the Commission.

For addressing software or vendor information, the ACSEC maintains a vendor list for any vendor offering these services. No endorsement is implied by this list.

$$$$$$$

Helpful Budgeting Tips

1. Know what tasks can be done up-front with little money.

2. Confirm what in-kind resources can be donated from others: maps, volunteers, phone bank staff, driving time.

3. Meet with the regional council of governments for joint purchase possibilities and state funding opportunities.

4. Scout the funding cycles of private foundations and their past favored projects prior to submitting a proposal. Know their requirements.

5. Present the addressing project as an important one-time cost.

6. If addressing will be part of a GIS, seek local partners to share costs.

7. Seek several opinions prior to purchasing consultant time or products. Check with previous clients as both a timesaver and moneysaver.

8. For maps, poll local surveying companies and utilities to locate current maps before committing to new map purchases. Check with TNRIS.

9. Seek advice from other successful community projects which relied on non-government financial assistance.

10. Announce the need for and account for all financial assistance; publicly thank those contributors at public events.

◘ Addressing Advisory Subcommittee ◘

Recommendations on Funds for Addressing

General Criteria

- Evidence of County commissioners' readiness and commitment to address
- County addressing plan and timeline in place
- Choice of logical numbering method for area
- Use of TIGER Maps and the ability to retain map ownership as developed

Fund Distribution

- Allocation based on specific need by county with supporting documentation

- Allocation based on physical and economic factors:
  1 - Route and Box numbers to be replaced
  2 - Road Mileage Unaddressed
  3 - Economic Factors: unemployment rate, population growth projection

- Distribution based on application within each regional council and through the ACSEC
  - Minimum amount projected to be $10,000
  - Multi-year project with "completion" determined at notification stage
  - Approved activities are address assignment, verification, notification, mapping, initial signage

- Typical 2-year project cost based on map acquisition, address assignment, verification, notification, some computer acquisition, and personnel: $35,000. Funding range will be based on factors 1 and 2.

Fund Origin

- State pool, consisting of grant funds and contributions from utilities and business statewide

- Incentives: joint purchase or state contract cost for software, equipment

- If available, service fee revenue within regional plans

CHAPTER 6 Maps For Addressing

Perhaps the most important tools in address assignment are the maps used for the project. Maps allow directional placement for basic addressing, serve as a grid for the registration of multiple layers, and can be used to build a data base for a large area from smaller pieces should a computer mapping capability be included in the project.

Maps

Base maps are the bedrock of an addressing system. It will be necessary to obtain or create a base map that contains the fundamental data necessary to address accurately. Maps are available from several sources: cities, counties, the State Department of Highways and Public Transportation, tax appraisal districts, the U.S. Geological Survey, the U.S. Department of Commerce Bureau of the Census, and also commercial mapping companies. It should be noted that each of these sources have different data to contribute to a base map. This is some of the information you might expect to find when using these maps:

- City and county maps show local road names, county road numbers, and incorporated area and county boundaries based on recorded property transactions.

- Appraisal district maps will give you property (parcel) and right-of-way information in order to locate property.

- Highway Department maps show all public roads existing in the counties, all bridges 20 feet and over in length, major drainage, railroads, cities, towns, and many other features of local importance.

- Aerial photography has the capability to display actual pictures of public roads, private roads, driveways, and structures as well as other topological features. The National Aerial Photography Program (NAPP) currently has the most recent aerial photographs in Texas.

- Maps from the U.S. Geological Survey are compiled from both aerial photography and field survey information showing detailed topological features along with the public road system.

- The Census TIGER line file maps were generated by the 1990 U.S. Census. These maps show the local road network including some street and county road names, address block ranges in urban areas, and some topological features.

Appraisal districts and school districts have recently been directed by the state legislature to capture particular district map information as part of their activities. As these districts progress in mapping, there is potential to offer or to share mapping expertise and resources.

There are three main types of maps:

Planimetric - a line map that displays cultural characteristics, including roads, some landmarks, and land drainage. A typical example is the commercial street map.

Topographic - usually a planimetric map that also displays the ground surface characteristics using contour lines. Topographic quadrangles of the nation are produced by the U.S. Geological Survey.

Aerial - actual photograph of the land surface geo-referenced with a common mapping coordinate system.

The most useful map information will be the current city and county boundaries, all road names and numbers, and parcel lines. A field survey of the entire area is recommended due to the fact that mapping accuracy will be no better than the least accurate map source used. How detailed a base map will be depends on how many features are needed for the addressing project objectives.

On the following page is a map provided by a commercial vendor showing two different addressing styles.

Addressing Styles

Courtesy of ETG Inc.

Massachusetts St
Massachusetts St
Massachusetts St

New Hampshire St
New Hampshire St
New Hampshire St

Rhode Island St
Rhode Island St
Rhode Island St

Connecticut St
Connecticut St
Connecticut St

New York St
New York St

New Jersey St
New Jersey St

E 6th St
E 7th St
E 7th St
E 7th St

E 8th St
E 8th St
E 8th St

E 9th St
E 9th St
E 9th St

899-801 799-701 699-601
898-800 798-700 698-600

KANSAS RIVER

UNION RD

FALL LEAF RD
FALL CREEK RD

CRAMER, LINDA 12194
STRAYHAN, JIM 12177
JAMES, PAUL 13590
WILLIAMS, IDA 10582
BILLINGS, CHRIS 10097
WELLS, RAY 9687
DOUGLAS, DAVID 7498
EDWARDS, KEITH 6941
SAUNDERS, BERRY 170
HARVEY, RICK 5794
SMITH, ROY 6349
GIFFORD, DEBBIE 4780
MORRIS, BILL 4787

Location

To describe how points of location are related to one another, one must use the concepts of distance and direction. There are several types of measurement of the earth's surface, with the most universally used method being the "Global Grid Coordinate System". Simply put, this system consists of grid lines running around the Earth north to south and east to west, with east-west lines called parallels due to being parallel to the equator. Parallels measure latitude, while north-south lines, called meridians, measure longitude. The incremental measurements are expressed in degrees (°), minutes ('), and seconds ("), from largest to smallest. On Earth, a degree of latitude equals 69 miles; a second is about 34 yards. For example, when ordering a 7.5 minute map, the land area displayed will be the equivalent of 8.6 miles in the north-south direction.

The "Universal Transverse Mercator" (UTM) metric grid system is a second type of mapping measurement, based on square grids of 100,000 meters on a set longitude and latitude. Designed by the U.S. Army Topographic Command, much of North America is mapped in this system of 6-mile strips showing township and range designations. The UTM system separates Texas land area measurements into three zones.

The "State Plane Coordinate System" is another method of measurement designed by the National Oceanic Survey, National Geodetic Survey using plane rectangular coordinates for Texas and all states. Texas originally adopted the system through law in 1943. This method is based on the location of original land survey monuments placed by the U.S. Coast and Geodetic Survey. The basic unit is a square of 10,000 feet per side. Adopted first by North Carolina, each state represents a segment of the system. If a state is relatively long from north and south and narrow from east to west, the Transverse Mercator system of measuring is used. States which measure broadly from east to west and are relatively short north and south use Lambert Conformal Conic Projections.

Since Texas conforms to neither of these models, the state was divided into 5 zones with individual x coordinates (east-west) and y coordinates (north-south) given to designate zone positions. Each Texas county will fall in its entirety into one of the five zones within the state plane coordinate system. Maps from the U.S. Geological Survey give state plane coordinates for each zone as well as longitude and latitude and the UTM measurements.

Scale and Measurements

The scale of a map is the ratio of the length of a feature as measured on the map to the true length of the feature on the surface of the Earth, expressed as a representative fraction. For example, a map at 1:2400 scale would represent 1 inch on the map as 2,400 inches (200 feet) on the ground. Maps are said to be

42

larger in scale as the denominator of the proportion gets smaller, and a larger scale map shows features larger than a smaller scale map. Graphic scale indicators can be shown as graphic lines or bars.

TIGER
Post-Census TIGER file maps are provided for public use by the United States Department of Commerce. These maps were generated by the 1990 U.S. Census and offer varying levels of information depending on the particular area of Texas in question. The TIGER file maps are produced at various scale sizes ranging from 1:4800 to 1:63,360 for county maps and from 1:4800 to 1:14,400 for city maps. These maps contain information including the local road network, some street names and county road names, address block ranges, census block and tract areas, and topographical information. The coverage of these maps is complete statewide and can be used with various Geographic Information Systems for base-map data retrieval.

Highway Department Maps
The county maps produced by the Texas State Department of Highways and Public Transportation are road maps showing all public roads existing in a particular county at the time of the field inventory. These maps also show bridges, major drainage, railroads, cities, and towns. Highway Department maps are revised to include changes in the State Highway System that have resulted from new construction or from the addition of new routes since the last complete revision. The revision dates on these maps varies greatly form the early 1960's to 1989. Only approximately one-fourth of the county maps have been updated since 1980. Of the remaining three-fourths of the county maps, most have not been updated since 1970. Only 30 maps are less than 5 years old. Recently the Highway Department has made a move to convert their paper maps into digital form.

Remote Sensing
To capture an accurate picture of the earth's surface requires moving away from the earth to get a better perspective of the land. Aircraft and satellites perform this function by measuring the earth's surface from their remote location, based on radiant energy that all earth materials reflect or emit. In the last 20 years satellites have increased their image-enhancement ability and cost-effectiveness to make the technology more accessible.

Aerial photographs record the earth's visible and reflected sunlight, infrared radiation, and microwave radiation. These photographs are then interpreted based on colors, patterns, texture, and resolution. Aerial photography is used in a

43

process called photogrammetry to create topographic maps. Typical map scales produced from this process are 1" = 800' and 1" = 400' for rural areas and down to 1" = 100' for urbanized areas.

Satellite-based remote sensing involves imaging the Earth's surface from the perspective of space. This technology has advanced over the past 25 years to provide high resolution imaging approaching the detail of aerial photography. SPOT Image Corporation is one such firm that produces this sort of photography. SPOT imaging can provide black and white images up to a 10 meter ground resolution along a 60 meter ground coverage area. This type of imaging allows for repeat photographs of certain areas several times a week. Since the orbit of the SPOT imaging satellite is sun-synchronous, the satellite always passes over the same location at the same solar time, observation of a particular region can be made regularly under the same sun illumination conditions. Viewing angles can be adjusted up to 27 degrees on either side of the satellite's vertical track which allows SPOT to view any location within a 950 kilometer wide corridor. This feature allows for viewing of the same site from different angles to produce three dimensional data that can be used for terrain interpretation and mapping.

Astronauts have been using hand-held cameras to photograph the Earth since the early 1960's beginning with the Mercury space missions. Since 1981 space shuttle crews have taken more than 37,000 photographs with 85% of these being Earth-looking views. The Shuttle hand-held photography fills the gap between aerial photography and satellite imaging, complementing these two formats with additional information from altitudes ranging from 110 to 300 nautical miles. With the combination of highly trained Astronauts, different types of photographs that have been taken (natural color, black and white with polarizing filters, color infrared) and photographing from different Sun angles provided by the Earth's rotation and the Shuttle's orbit duration to highlight different geologic features, there is a wide range of unique photography available.

Field Surveys.
There is no good substitute for actually driving the road to reveal the base map accuracy, or inaccuracy, needed before assigning addresses. For smaller areas a field survey is quite manageable. For larger areas, more staff time and travel costs are likely. One helpful tool for the survey is a digital measuring device (in feet) designed to be mounted on a vehicle. Forestry or surveyor supply sources can provide this tool or it might be acquired on loan from a governmental agency or university.

Logs of field surveys can be composed of the customer list printouts from utilities, route maps from the postal service, or combinations of aerial photos and grids.

44

Numbers of structures, entrance direction, and other features for each parcel are noted on the logs during the survey.

A good starting point to identify maps and their availability is the state agency, Texas Natural Resources Information System (TNRIS). TNRIS has conducted inventories of computerized and non-automated natural resource data housed in Texas State agencies. These inventories include aerial photography and map holdings of private companies, universities, libraries, and other entities. TNRIS also maintains a library of data which can be accessed directly. This library includes aerial photography, satellite imagery, U.S Geological Survey maps, and several other map collections available for in-house use or reproduction. Computerized files have information pertaining to water resources, meteorology, biological resources, geology, and Census data.

The following map types are described for their use in addressing projects.

Map Features

Source	Type	Scale**	Cost
Counties	Aerial, plat records	1:100 1:400	Varies
Appraisal Districts	Aerial, line parcel, wall-size easements. Updated - 5 years or more often	1:100' 1:400'	Varies
State Highway Department	standard topo., line & digitized, aerial	See "Type" 1:2,000	Varies TNRIS, U.S.G.S. Aerial $4/sheet
U.S. Bureau of Census	TIGER Line File	Varies	$30

Source	Type	Scale**	Cost
TNRIS, U.S.G.S.*	U.S. standard topo. 7.5 & 15 min. quadrangles; Orthophotomaps show color, state/county/local bound- aries, roads, rivers. Orthophoto- quads show black/white, some color but few symbols or contours. Land use/land cover maps are available in 1:100,000 - 250,000 scale.	1:24,000 1:50,000	Ranges by specific product
U.S.D.A. ASCS	High-altitude photo enlargements	1:20,000+	$25-50
Private Map Services	topograph., digitized aerial	Varies by request	Varies

* Digitized map data from the U.S. Geological Survey is available for portions of Texas on a limited basis. Contact the Denver office of USGS for specific products (see Appendix).
** Map Scale ratio is expressed in inch:feet.

Geographic Information Systems

A Geographic Information System (GIS) is a computerized system designed to capture, store, process, analyze, and manipulate attribute data, descriptive information such as a map, photo, or deed, and spatial data, location information. A GIS can be more specifically described as a collection of a defined set of geographic information, an organizational setup for carrying out the task, a computer graphics system, a data base management system, a set of geographic analysis and modeling capabilities, and a set of graphic presentation and tabular report generation capabilities. One of the earliest uses of a GIS came about in epidemiology; plotting the occurrence of a disease (attribute data) such as dysentery on a map which included water sources (spatial data).

Visualize a GIS as a large microscope. Microscope slides will be the sources of data and when combining two or more slides to view simultaneously, new relationships can be seen from data and new information can be produced from these overlayed pictures.

As with all computer technology, the important question for the working or steering group is what are the objectives for using this microscope? Defining objectives forces the users to identify the products a GIS can deliver, look at hardware and software purchases with current and future needs in mind, determine the external demands for the products, and consider data sharing with other entities. Some larger projects may wish to employ a pilot program or feasibility study to fully define project needs before committing all financial resources.

The main components of a GIS are hardware, software, and data. A GIS can operate from the most powerful mainframe, a minicomputer, a workstation, down to the microcomputer. Surprisingly, the hardware for a GIS can be expected to represent just one-fourth of the cost of the system; the acquisition and entry of data will represent the majority of system costs.

Once the hardware and software are acquired, spatial and attribute data can be added. Selecting data sources to be added to your GIS should be done keeping in mind current and potential users. How much data and what types will depend on the users need for information and the capacity of the computer to process all data sources efficiently. An effective GIS will be governed by two factors: having data available in the proper format needed for operation and, second, having available the proper relational model or "logic" process to operate on this data.

Digital Data

Digitizing is the conversion of spatial data into a machine readable form that can be stored and organized within the computer. This data capture can be achieved several different ways. **Manual digitizing** is a very basic and time consuming way of capturing point coordinates for the computer using hand digitizing tools. Using

a line following digitizer to enter points along a line, enough points are captured so as to allow the computer to re-display the line by plotting the points and connecting them with straight line segments.

Scanning digitizing is a faster and more precise method that uses a laser to scan a printed document, such as a map, to create a raster data file. A raster file is a pattern of closely spaced rows and columns of dots that form an image on a computer screen. For each cell formed by the rows and columns, the presence or absence of a vector (line) is recorded. These short vectors are linked to form long vectors and then edited to add feature identification or delete unwanted features. To complete the scanning process, the data must be registered to a grid such as latitude and longitude. Some maps can be acquired in a digitized format, simplifying the loading of spatial data in to the computer.

GIS Query

One of the potential opportunities with a GIS is the query ability. A query is the search of a data base for the purpose of extracting specific portions of the data base by pre-selected criteria. In the case of emergency services, searching an on-screen street layout can give a dispatcher faster feedback should an emergency team need information en route. The query can be made specifically of either attribute data, spatial data, or a combination of the two data files. Query output can include tabular listings, data files, maps generated from single data layers, and maps generated from multiple data layers.

An **attribute query** of the data base can be directed toward one or a combination of attributes independent of spatial data and can be used to generate reports and text files. A **spatially defined query** can be used to access information for a particular geographic area. This type of query can produce maps, files, reports, and also provide computations on the results. The last query type is the **combination query** which is used to perform an attribute query within a spatially defined area resulting in data that can be used to generate maps, files, and reports.

GIS Software

There are several varieties of software upon which a GIS may be built. ARC/INFO, Atlas*GIS, ERDAS, GRASS, MapInfo, and TIGRIS are just some of the commercial software programs used with a GIS and, certainly, consultants can provide many other choices. There are also several publications on the market that track the most current technological trends in GIS. Most software programs can "run" on microcomputers. Depending on the project, a simple application such as number assignment, may be possible using a minimum of staff and resources. These programs con be very powerful and, in order to justify their cost, planning groups should specify their applications at the outset.

Map Contents

> The county central appraisal district is the key mapping resource for each county and should be used extensively in addressing.

a. Central appraisal districts are currently responsible for and have expertise in taxing unit boundaries and parcel locations. Members of central appraisal districts share a proportion of appraisal costs based on taxing units' taxes imposed relative to the entire district. A local mapping effort could be similarly shared in cost and usefulness.

> Maps produced should display existing roads and road names. Other features would be beneficial, such as bodies of water, and landmarks.

a. Legends should ideally include road type; for example, county road, private, interstate. Maps should also display city boundaries, bridges, navigable waterways, and low-water crossings.

Intermittent streams should be noted, particularly in counties where flash floods are a common occurrence.

> Maps used for addressing should be compiled using latitude/longitude coordinates or state plane coordinates with appropriate projection.

U.S.G.S. maps will indicate latitude/longitude as will TIGER maps since they are built on U.S.G.S. 1:100,000 maps in rural areas and GBF DIME files in urban areas. A cartographic standard for map data is NAD-27. GIS software should allow for changes in map projection. The DIR task force on GIS is including this issue in its study.

> Currency of map should be most recent available.

Map currency is not 100% reliable without field verification or "driving the roads" to verify locations. Aerial photography or satellite imagery can improve accuracy.

Digital maps should display street name and address block ranges.

a. Block ranges are defined as 100-block increments or as broken by intersection. Even and odd numbering of streets should be indicated.

Computer map accuracy should adhere to U.S.G.S. National Map Accuracy Standards.

Accuracy level is based on scale: it is not expected to be exact for engineering precision but is useable for addressing. Positional accuracy, as used at U.S.G.S., is as follows:

Scale	Positional Accuracy
1:24,000	+ or - 40 feet or 12.2 meters
1:100,000	+ or - 166.7 feet or 50.8 meters
1:250,000	+ or - 416.7 feet or 127 meters
1:500,000	+ or - 833.3 feet or 254 meters
1:1,000,000	+ or - 1,666.6 feet or 508 meters
1:2,000,000	+ or - 3,333.2 feet or 1,016 meters

Where digital line graphs (DLG) were used, the U.S.G.S. will not guarantee the above accuracy after the DLG has been translated by third-party software.

Map graphics and attributes should be importable from and exportable to other formats.

a. Internal standards for telephone companies are such that data exchange formats should be compatible with most mapping software.

Maps and addresses developed by or for public entities will be available as allowed under the Open Records Act.

a. Copyrighted material by public entities may be restricted in use but not accessibility. In most cases, data developed or purchased by state or local governments will be made available to the public at cost of reproduction.

50

Standard for street name abbreviations will be U.S. Postal Service standard.

a. See Postal Addressing Standards

Included on the following pages are examples of a GIS being used for street addressing and other uses.

Harris County Central Appraisal District
(1985 Est. population 2,794,700)

Harris County Appraisal District, as other districts, maintains and determines property valuations for taxing units. With a high volume of parcels to assess in an urbanized area, the District decided to take advantage of decreasing automation costs and set up an automated mapping capability. This capability will build on the information management system already in use by the District.

Appraisal districts in urban areas experience increasing demands for real estate information from the public sector. Since most information requests come in geographic form (account number, legal description, street address), Harris County will link tax administration and valuation records with the new mapping application. Tax administration records contain identifying numbers such as current owner, legal description, and historical data. The valuation record contains information describing the physical characteristics of a property which ultimately influence valuation. The mapping challenge is to develop map records which correspond to the tax administration and valuation records while keeping all systems synchronized on a daily basis.

Harris County Appraisal District set out to identify the primary applications desired from a GIS and spent two years analyzing the GIS requirements before developing a request for proposal. This analysis included a review of existing GIS projects, a review of existing mapping databases for possible use to reduce project costs, and the cost impact to taxing districts served by the District. Nine proposals were received and competition produced favorable costs to the District in completing the project.

A graphic and non-graphic use was foreseen in District user applications. Many typical boundary graphics associated with parcels are included, such as dimensions, acreage, lot lines, easements, and flood plains. Non-graphic information includes primary data from the tax administration and valuation records, such as owner name, address, description, and property value.

A contractor is developing this system and will maintain certain elements of the GIS, such as owner's name, address, identification numbers and other associated data. Fourteen source materials have been chosen to develop the graphics, eleven of which are maps. With the number of source materials, reconciliation and verification are essential to the District's success. Without reconciliation and verification, errors can translate into incorrect valuations, miss-matched property characteristics, invalid assessments, and possibly inaccurate tax revenue estimates to taxing units.

The contractor completed the mapping and verification tasks by working small segments of the county and adhering to a strict weekly delivery schedule. The

District believes that this approach will allow any necessary additions to the GIS design or modifications to map construction procedures in a timely fashion.

Map development costs over a five-year period were expected to be $7.5 million. The District considers the cost as an investment with many benefits to be recognized in property inventory, record maintenance, support to taxing units, and appraisal analysis. The District also expects potential applications for the private sector in using complementary databases in conjunction with the GIS.

Ken Graeber, Chief Appraiser, HCAD

New York
Erie and Niagara Counties
(Population: 1 million +)

The Erie and Niagara Counties Regional Planning Board represents two counties in western New York as a general planning body. It considered forming a GIS in late 1986 as a result of the City of Buffalo's desire to maintain land, environmental, and socioeconomic information in a joint manner. The Erie and Niagara Counties Regional Planning Board appointed committees to look at the interests of some 22 agencies and municipalities in hopes of forming a regional GIS.

The Board had served in the past as an information conduit and, due to cutbacks in federal funding, found itself relying more heavily on computers with less staff to continue their information tasks. An attempt was made to use a CAD software package however there was no means to link intelligent data with mapping. At a subsequent meeting, the Board and the City of Buffalo discovered a high degree of community interest, including the nearby State University of New York at Buffalo (SUNYAB). As a result of the university hosting a GIS workshop, the Board volunteered to be the beta test site for a GIS from a private vendor in 1987. Software was then developed and tested.

A user's group was created to study mutual uses in information storage and retrieval. The following issues were identified:

1. How to efficiently organize a regional database.
2. How to locate the software to meet specific applications.
3. How to locate existing data necessary to these applications.
4. How could the user's group become more educated with a GIS.

A survey of user needs was distributed to 100 agencies, with the results helping to identify information most needed by the agencies. The majority of users need information for land use purposes such as floodplains, zoning, and roadways. Utility services accounted for some 15% of usage.

The survey also asked for a "GIS wish list" from users: they asked for groundwater studies, an economic census, shoreline development, and electoral district analysis among others. All survey respondents had use for a GIS display, retrieval, and analysis capability.

From this survey, a tally was taken to determine which features would be most universally used. Parcel level information was determined to be the basis for integrating additional information. Other uses were clarified and defined by the users group.

The initial pilot project was to test the software in digitizing parcel maps within a small area of Buffalo. Two census tracts were digitized for this experiment. Using the state plane coordinate system, the parcels were selected by their unique "centroid" numbers or coordinates. Attribute data for the parcels was added and tagged to each parcel via the centroid number. In addition, census data from three previous decades was included in the identification. This project was successful and was eventually demonstrated before the western New York state assembly delegation.

The conclusion of this user group was that a regional database could be shared successfully for updates, management, and querying. The next phase of development included digitizing both counties' urban areas, with a test including all utility maps.

Users recommended the following:

- A committed, supportive user group and an able institution such as SUNYAB helped ensure success of the project.

- Pilot projects should be small and be based on actual applications.

- Concentrate on user needs and not be distracted by technology.

- Regular meetings of the user group facilitates progress.

CHAPTER 7 Signs

Address signs and markers are important as the final link in locating structures and inhabitants. Texas state government provides materials and signs for all state and interstate highways, while county and municipal governments provide signs for roads within their respective boundaries. The following is an overview of road sign use and acquisition.

Sign Specifications/Sources

A street sign and a residence/structure marker complete the link between assigning addresses and locating structures. The planning or steering group should anticipate sign needs in the initial stages of addressing and plan for the costs of posting new signs and modifying existing signs. The roadway type and posted speed limit should be the guide when setting street sign size specifications so that the public can read and understand signs at posted speeds. For example, on roads with posted speeds of 45 mph or higher, sign size should be highly visible in order that traffic hazards are not created by drivers slowing down to squint at street address numbers.

Street sign specifications will be more technically detailed than self-posted residential signs which may simply prescribe the number size. County engineers or public works departments may specify the standards for their signs or they may adopt standards in use by state or federal government. Specifications typically include size, material, longevity, ability to be seen and to reflect light, as well as other factors.

The largest state government user of signs, the Texas State Department of Highways and Public Transportation (SHD) purchases the majority of their sign materials from the Department of Corrections. State Purchasing and General Services Commission processes the orders needed by the SDHPT for signs which TDC is unable to produce. Signs are not generally available through the state purchasing contract, however, the names of vendors who compete for the state highway signs are available through the State Purchasing and General Services materials office.

Sign Production by the Texas Department of Corrections
A segment of the Texas prison population participates in Prison Produced Goods, a program that employs inmates in jobs to manufacture goods and services sold to the public. Road sign products as well as other items are available from TDC.

As with other vendors of these products, the Department of Corrections in Huntsville takes letters of request for sign production and performs a cost analysis. They respond with their project cost estimates, with most goods being produced within 30 days of receipt of an approved estimate. Depending upon their production schedule for the SDHPT, signs may be produced more quickly or more inexpensively through public bids from other vendors.

Sign Costs and Joint Purchase Agreements
Typical sign costs range up to $50, depending on total sign hardware needed. Costs for signs tend to drop as quantities increase, therefore, joint-purchasing arrangements are beneficial. Street signs may be a joint-purchase item ordered through the local regional council of governments or through other joint-purchasing agents and associations.

Some "signs" may take the form of plates or tags that can be applied to existing posts. In some communities, a computerized letter-cutting machine is commercially available for counties who wish to produce their own signs. This machine, at a cost between $8,000 and $12,000, does not involve work with hazardous materials such as those older processes utilizing paints and solvents, but instead uses sheet materials. Several district highway department offices use this tool for in-house production of department signs. For counties considering starting a sign manufacture and painting facility, a certain level of inherent danger exists in the handling of some hazardous materials and the disposal of hazardous materials must meet federal standards.

Counties may want to investigate an equipment-sharing or sign acquisition agreement with other the local governments or with the district office of the SDHPT, particularly in sparsely-populated areas.

"Piggy-backing" Signs with the State Highway Department
The Highway Department currently offers a policy to facilitate county route markers and road signs being placed on those state signs already erected. Specifically, cities and counties can provide their local signs to the Department for installation alongside of state road signs for the cost of installation. The Division of Maintenance and Operations within the Highway Department is responsible for such agreements and can offer more details on this arrangement.

County Route Markers

Major County Roads throughout the United States can very shortly display the "County Route Shield" adopted by NACO at its Natural Beauty and Recreation Congress in Honolulu. The attractive blue and yellow pentagonal-shaped shields will be the official symbol for the more important county roads in our counties.

The NACO Board of Directors adopted the plan prepared by William D. McIntosh, county road commissioner of Lassen County, Calif., and first vice president of the National Association of County Engineers. The program was also enthusiastically endorsed by NACE at its Management-Research Conference in Seattle in February.

The program allows for implementation by state associations where they exist. Assistance in recordkeeping will be requested of the various state highway departments, and in those states not having state associations, the highway departments will be asked to assist directly.

The program, successful in California for several years, will soon be available to every county in the United States. The distinctive route shields will serve to give our major county roads the dignity and stature they deserve as the program grows and markers appear on roads and road maps.

It is anticipated that through the efforts of Delos Hamlin, NACO's representative on the National Committee on Uniform Traffic Control Devices, the county route marker will be incorporated into the next publication of the "Uniform Traffic Control Devices Manual."

The plan and the thirteen-point program adopted by NACO is as follows:

I. DEFINITION. A County Route Marker Program should not be confused with "Standard County Road Signs" or "Standard County Road Signing Programs." The County Route Marker Program should be clearly defined as a program to mark county routes of major importance that are of general public interest; that are constructed to sufficient standards to guarantee safe passage to the motorist; that are properly signed in conformance with the "Manual on Uniform Traffic Control Devices" to further ensure safe travel; and that have a logical beginning and logical terminus without reference to city, county, or state boundaries.

II. IMPLEMENTATION. It is recommended that the following thirteen-point program be adopted by the National Association of Counties, and that individual state associations be encouraged to adopt the same program and implement it within their states with the cooperation and assistance of the state highway departments, and county engineers' associations where they exist. The National Association of County Engineers [an affiliate of the National Association of Counties] will offer any assistance requested. The recommended thirteen-point program is as follows:

1. That a program of placing county route markers on certain county roads is most desirable and beneficial to counties as well as the travelling public, and would perform a most valuable service to the public.

2. That such a program should be implemented by the National Association of Counties, thereby becoming available to individual states and counties.

3. That insofar as practical, route marking conform to the "Purpose and Policy in the Establishment and Development of United States Numbered Highways" as adopted and revised by the American Association of State Highway Officials (AASHO); and that the method of installing such signs follow the principles set forth in the "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the U.S. Bureau of Public Roads in June, 1961.

4. That the recommended sign be a pentagon with rounded tip corners, 18 inches by 18 inches in size or larger, with yellow letters, numerals, and border on a blue background.

5. That the routes to be so numbered be selected by the boards of supervisors, county commissioners, etc., of the respective counties involved with any particular route, by a proper resolution by said board; and that in the event intercounty routes or routes into or through incorporated cities are requested for numbering, that resolutions from each board or council involved should be on file prior to assigning a route number in any one county.

6. That the routes to be so marked, conform to the following criteria:

a. That the route be a major road of general public interest, such as qualified connections between state highways or county signed routes; or

b. A road leading to a major facility of a state park, county park, national park or monument or historical monument; or

c. A road leading to a major publicly owned recreational area or to a major defense installation or area; or

d. A major arterial street or road.

7. That each state association set up a board of review to administer and monitor the program;

and that said board of review be composed of representatives of major automobile associations, county engineer, traffic engineer, and county supervisor.

8. That individual state highway departments should be asked, through their state-aid departments, to act as the agency to select a numbering system, assign numbers, and to keep the necessary permanent records required.

9. That numbers will be assigned by the state highway department only upon receipt of the resolution of the board and with the approval of the board of review.

10. That these rules and regulations are guides to be followed and should be subject to amendment or change to suit individual state situations.

11. That detailed administration of this program be handled by the state associations where they exist.

12. That this program be implemented on a *voluntary* basis, and that no legislation be requested unless absolutely necessary to the working of the program.

13. That, upon approval and acceptance of this program by the National Association of Counties, the necessary steps be taken to include the standard "County Route Marker" shield in the "Manual on Uniform Traffic Control Devices for Streets and Highways."
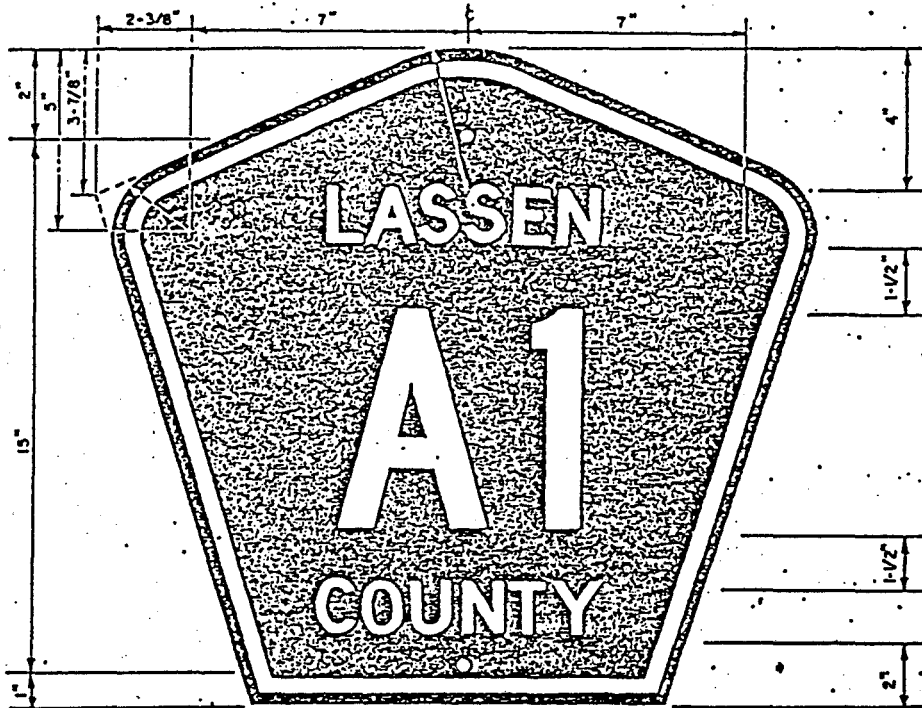
G25R-1

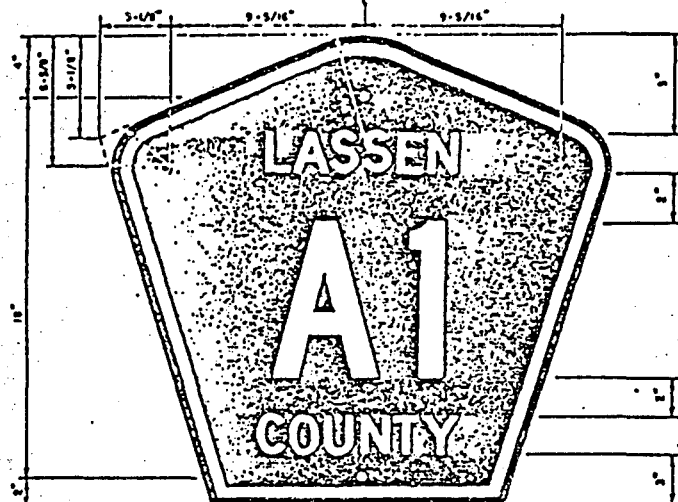| CODE NO.	SIZE	BORDER WIDTH	MARGIN WIDTH	LETTER SIZE & SERIES					HOLE CENTERS	HOLE DIA.	CORNER RADIUS	REFLECTORS	
				LINE 1	LINE 2	LINE 3	LINE 4	LINE 5				NO.	SIZE
G25R-1	18" X 18" X 10-5/8	1/4"	1/4"	1-1/2"D	6"-C	1-1/2"D			2" 15" 1"	3/8"	AS NOTED		

BLUE BACKGROUND WITH YELLOW BORDER AND SYMBOL.

REMARKS

24" x 24" x 14-3/16" MARKER USED ON STATE HIGHWAYS

G34R ARROW TO BE USED WITH MARKER WHEN NECESSARY USING BLUE BACKGROUND - YELLOW BORDER AND SYMBOL 16" x 8½" SIZE.
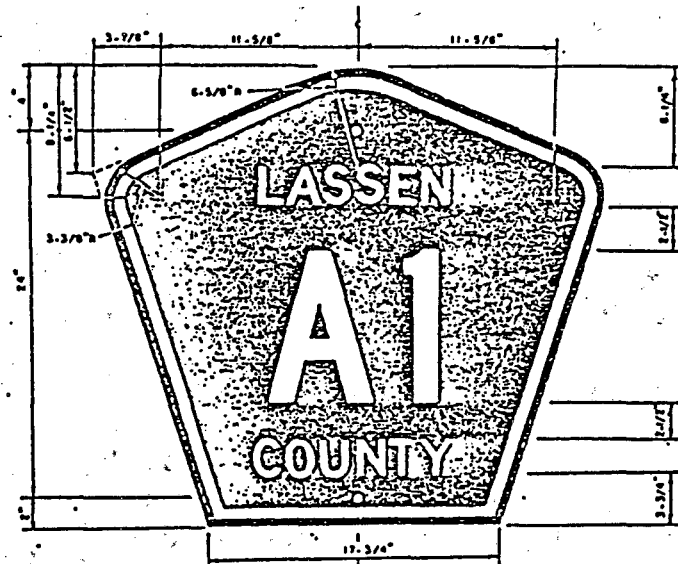
USE REFLECTIVE SHEETING ON BACKGROUND, BORDER & SYM.

CODE NO.	SIZE	BORDER WIDTH	RADIUS WIDTH	LETTER SIZE & SERIES					HOLE CENTERS	HOLE DIA.	CORNER RADIUS	REFLECTORS	
				LINE 1	LINE 2	LINE 3	LINE 4	LINE 5				NO.	SIZE
G25R-2	24 x 24 x 14-3/4	3/8"	3/8"	2"-D	8"-C	2"-C			4" 18" 2"	3/8"	AS NOTED		

BLUE _____ BACKGROUND WITH _____ YELLOW _____ BORDER AND SYMBOL

REMARKS

G25R ARROW TO BE USED WITH MARKER WHEN NECESSARY USING BLUE BACKGROUND-YELLOW BORDER AND SYMBOL.

USE REFLECTIVE SHEETING ON BACKGROUND, BORDER & SYMBOL.

CODE NO.	SIZE	BORDER WIDTH	RADIUS WIDTH	LETTER SIZE & SERIES					SYMBOL		HOLE CENTERS	HOLE DIA.	CORNER RADIUS	REFLECTORS	
				LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	STROKE	WIDTH				NO.	SIZE
G25R-3	30 x 30 x 17-3/4	3/8"	3/8"	2-1/2"D	10"C	2-1/2"D					4" 2"	3/8"	AS NOTED		

BLUE _____ BACKGROUND WITH _____ YELLOW _____ BORDER AND SYMBOL.

REMARKS

STROKE WIDTH: USE 8 W" PER LETTER HEIGHT FOR "C" LTRS. USE 8 W" PER LETTER HEIGHT FOR "D" LTRS.

G25R ARROW TO BE USED WITH MARKER WHEN NECESSARY USING BLUE BACKGROUND-YELLOW BORDER AND SYMBOL.

USE REFLECTIVE SHEETING ON BACKGROUND, BORDER & SYMBOL.

Profiled in the following pages are recent addressing projects in three Texas counties. Each project encountered some problems common to other counties and discovered other features which were unique only to its project. These examples offer valuable information and insight for communities approaching addressing projects.

Initial Texas Projects: Tarrant and Smith Counties

Tarrant County 9-1-1 District and Smith County 9-1-1 District both initiated addressing projects in 1986 as a result of their needs for street addresses to implement an enhanced 9-1-1 system in their respective counties. Neither county was addressed outside of the city limits, yet these districts assumed responsibility for addressing these areas as the need arose. Tarrant County moved to set up their working group and work plan in mid-1986 while Smith County followed suit in late 1986.

Tarrant County's population was about six times the size of Smith County with both objectives being to address the entire unincorporated areas. Because the Tarrant County unincorporated area was addressed simultaneously, the project staff encountered early on many of the typical addressing problems expected in addressing projects, such as extended time needs for data verification and adding or changing street names and addresses in heavily developed areas of the county. Smith County addressed individual segments of the county at the request of the Postal Service.

Both counties contained major cities with addressing block grids schemes which the 9-1-1 districts then extended for the remainder of the unincorporated areas in their counties. Base maps in both projects were developed using aerial photographs and parcel maps from their appraisal districts at a scale of 1:200 and 1:400, with Smith County using TekniCAD mapping software.

Grid blocks were also identical at 528 feet per block, 100 numbers allotted to each block, 10 blocks to the mile. Both counties also acquired property ownership data in computer-useable form from their appraisal districts for their selected areas.

Both counties encouraged their citizens to name any unnamed roads in accordance with existing procedures. Field surveys were used extensively in both projects. Smith County contracted out for aerial photography. Smith County's digitized map data were then used to mark driveways with coordinates so that a numbering sequence could be computerized. This information plus the emergency services boundaries was added to the appraisal district data to form a more complete database for Smith County.

One drawback of this computerized number assignment package is that any address deviation from the grid necessitates manual numbering, such as a street which sharply changes direction mid-grid. For this reason, Smith County refers to their grid as a "stretch grid." Much of Smith County's addressing concept was drawn from viewing the Houston Lighting and Power scheme in Houston.

Tarrant County and Smith County used postal service route maps and local utility customer records to cross reference and verify residents' locations. Both project staffs found this a time-consuming task and one in which future projects should note and allow adequate time within overall timetables.

While neither district had legal authority to mandate the use of these new addresses, both projects strongly encouraged adoption and use of addresses. Since most residents desired mail delivery, having the Postal Service utilize these new addresses certainly contributed to the adoption process.

Notification of new addresses was done by both districts through mailings to the addressees. For new address assignment, a prepaid postcard is sent to residents confirming the new address. This step facilitated address corrections and assisted the utilities with record updates.

Some of the basic features for each District's project are described on the following pages.

9-1-1 Network of East Texas

<u>Street naming/numbering:</u> County roads which had "inherited" other local names were addressed using the proper county road number. Private roads or unnamed roads were generally numbered off of the nearest main road. Names were not added to roads that had none. Numbering started at the central axis in Tyler and increased proportionately in all directions.

<u>Costs:</u> Project costs were borne by various participants, depending on the project phases. The addressing portion costs were divided among agencies and utilities based on customers served. The 9-1-1 District contracted separately with the computer vendor and with the project partners. Vendor costs were approximately $130,000. Other sizeable costs not estimated were for staff time and materials.

The 9-1-1 District emphasizes that the private sector users among their working group did not "buy into" the project for mapping uses. As the project progressed, it became apparent to the 9-1-1 District that there would be advantages to computerized mapping, such as ease of address updates and the possibility of developing products for other agencies use.

<u>Address Maintenance:</u> Smith County 9-1-1 District assigns addresses, while the Smith County Appraisal District maintains the base map.

<u>If done today, what would be done differently?</u>
Little would be changed in how this project was implemented. One suggestion which helped ensure this project's success was the research time spent prior to soliciting requests for proposals (RFP) on the computer mapping segment. Approximately 4 months time was spent gathering information from computer mapping vendors and scrutinizing the products which Smith County wanted prior to the RFP.

Contacts: Woody Glover, Jan Funderburgh

Tarrant County 9-1-1

<u>Street naming/numbering:</u> The county courthouse served as center point. Most streets had existing names; residents were encouraged to name those which had none in accordance with county procedures. Hardware consisted of an AT-level computer, 20MB hard disk and dBase III+ software, with entries backed up daily.

<u>Costs:</u> As the forerunner in addressing projects, the District documented project tasks and problems that have been useful to others. Approximately 1 year was required to complete the initial stages of the project with a budget of about $75,000. The total period of implementation was estimated to be close to four years. Annual ongoing maintenance costs are approximately $25,000. Project costs were absorbed by the 9-1-1 District.

<u>Address Maintenance:</u>   Tarrant Appraisal District handles address assignment, updates, utility inquiries, and maintenance tasks through an annual contract with the 9-1-1 District.

The 9-1-1 District works closely with the appraisal district to maintain the data file, update the master street file as new plats are filed, and to provide new hard copy listings for other users. The addressing function will be assimilated within the property record development process as standard appraisal district procedures.

<u>If done today, what would be done differently?</u>
The District recommends earlier enlistment of help from the appraisal district for use of their records, maps, and other tools. They suggest a gradual assignment of addresses by segment rather than the whole area.

More time for staff and address transition is also recommended by the District. Once residents receive notification of new addresses, staff will be needed to handle telephone inquiries.

Alertness to errors within map sources and other data underscore the value of "scrubbed" or cleaned-up maps and files.

Contact: Beth Ozanich, Database Manager

Lubbock County 9-1-1

The Lubbock Emergency Communication District voted in 1988 to standardize their county's addressing in unincorporated areas with those addresses inside the city limits for use in the 9-1-1 system. Many residents in unincorporated areas had simply assumed addresses for their property. The District anticipated an addressing project to cover nearly 10,000 service locations in the unincorporated area (telephone access line count).

The District staff quickly found special characteristics about the county as they approached the addressing project. The county is heavily populated with mobile homes, with mobile home parks being assigned one street number and the parks undergoing resident turnover of about 100 per week. The District found several landlocked tracts with varying access agreements and easements. They also noted that these county areas for the most part lacked road markers.

A great deal of coordination was in store for the District. Funding for the project is provided by the 9-1-1 District with assistance from the central appraisal district, the Lubbock city planning department, and utility companies. District staff assigned addresses in the unincorporated areas.

Project Components

1.   Base maps were created using the appraisal district's parcel maps on a scale of 1" = 300'.
2.   The Lubbock city planning department provided their address database. For outside of the city limits, the appraisal district provided the property database via the ownership files showing structure description and parcel number.
3.   Lubbock County is divided into sections which are tracked by the county roads. These sections designate county and farm-to-market road numbers outside of the city limits. The parcel information directly tracks the section maps throughout the county. Where county roads do not line up with sections, they are assigned a letter for each 1/8 mile increment.
4.   The chosen address method extended the existing grid from central Lubbock. Blocks outside of the city limits were measured 8 to the mile. Address numbers increase by direction from the center, with odd numbers on the left side and even numbers on the right side of the street. The interval distance is 50 feet, with numbers being assigned at the curb cut (driveway).
5.   The District employed an extensive verification effort to locate as many structures as possible. Aerial photos (dated 6-7 years) were used in comparison with parcel maps. Electric co-operative maps were compared to appraisal district maps. The co-op had the capability to print out customers by meter and by resident. Telephone calls were placed and questionnaires distributed in order to verify locations.
6.   The City and the 9-1-1 district share address assignment.

7. The database includes name, address, telephone number, telco name, name of exchange, map number for appraisal district, and mailing address. An additional field of some 20 characters exists to supplement the address if needed. The field size for including street names differed among the two telephone companies, with a difference as large as 12 characters.

In 1991, approximately 80% of addressing is completed and is scheduled for completion in October 1991. Postal conversions will begin after October and will be phased in by the postal community and by rural routes.

Contact: Ben Goodloe, Database Manager

PROJECTS IN OTHER STATES

Illinois

Illinois is similar to Texas in its percentage of rural road miles which crisscross their state. In 1975, Illinois decided to tackle their problem of inaccurate rural addressing with the goal to uniformly reference and report the locations of traffic accident data. A "Rural Reference System" was created by a special statewide committee of local officials, highway staff, and associations representing law enforcement, agriculture interests, fire protection and rural letter carriers. The numbering method chosen by this committee consisted of using existing county "sections" for grid systems, with intersections to be numbered to form the section boundaries.

The Rural Reference System is designed to serve individual counties with a number assignment program. Sixty-nine of the 102 Illinois counties have utilized this program, with the average project implementation of one year.

Funding Information: Section 402 Federal Department of Transportation funding from the State of Illinois, which requires a 75/25% local match, provides basic funding. Funds are distributed on a priority need basis, with counties having no form of addressing placed ahead of counties which do have some type of system. The program's budget is currently about $200,000 annually with an average of one project funded each year. The average project cost is $60,000 which in turn covers the numbering of 600-700 county intersections. In addition, their program prescribes contract language with local contractors and specific sign design and materials.

County Concerns: Vandalism and sign maintenance are recurring problems once a numbering system is implemented; in many cases, the costs to replace signs is prohibitive to Illinois counties participating in the program. The state is enacting sign design changes to reduce vandalism and increase sign longevity.

Automation of the system is not required however counties are responsible for updating their maps periodically.

State Concerns: The original intent of this system was to more accurately collect Illinois traffic accident data statewide in order to identify dangerous roadways. Whether this intent has been successful is yet to be determined.

66

New Mexico

New Mexico has introduced a rural addressing system for several rural counties as a solution to locating problems associated with the emergency services and telephone utility connections. Prior to this project, the New Mexico utility industry had estimated a loss of $5 per misrouted service call due to addressing inaccuracy or absence of addresses.

The Digital Mapping Laboratory at New Mexico State University designed this system in 1985 for microcomputer use and possible use in the upcoming census data-gathering set for 1990. The university laboratory originally designed and installed this system with a large data base to handle multiple uses such as voter registration and taxing district records. To date, several counties throughout New Mexico have converted to similar software used in the original project, although many chose not to implement a large multiple-user system.

New Mexico's system differs from other state examples by the data sources it uses. Two principal sources are the U.S. Geological Survey and the Bureau of Census. Aerial photography supplies topographical displays of rural areas which are then digitized and transferred into a county's data base. The creators of this software found the digitizing accurate to the extreme of counting cattle guards or oil wells should such an inventory be needed.

Assigning numbers is based on the maps produced by pen plotters using the software and field work staffs physically verify numbers. Any changes are then added to the database.

This program was developed as a pilot project, and since the origin of the project, other counties have developed their own programs and software to implement them. Technical support was available from the project authors, however, no replacement program has been established.

Financial Information: Most counties have found the capital outlay and staff cost to be greater than other manual numbering options with at least 3 to 5 years cost payback. For this type of project, hardware and software costs may approach $40,000. Adding in staff costs places this system out of reach for some of New Mexico's financially-strapped counties. There is the potential for several counties to share such a computer system and share in the costs, using modems to transmit data to remote areas.

The university system authors advocate multiple uses of such a system to make it more cost-effective and more productive in terms of information to local governments.

Iowa

In 1980, the State of Iowa conducted an addressing survey of their 81 counties which revealed some 12 different rural addressing methods in use. The survey also found the average Iowa county utilized four different address systems. In 1981, the State's Office of Planning and Programming elected to help establish two types of uniform county rural address systems to improve service delivery and to reduce maintenance costs.

The Office of Planning and Programming recommended two numbering systems to their state's counties, the street-avenue system and, what they termed, the standard rural address system.

The street and avenue system is created around a central "base point," be that the geographical center of a county, a city, or one corner of a county. From this point, north-south roads are "streets" and east-west roads are "avenues," with quadrants naming the northeast, northwest, southeast, southwest areas. Numbers are assigned 100 per mile. Each intersection and quadrant must be marked in order to use this system.

The standard rural address system used by Iowa is a rural locator system adopted by their Fire Service in the late 1950's. This system does not depend on intersection markers but upon the residence markers which indicate a road number and the number of the nearest intersecting road to the west or north. This system can work across county lines.

The first system is more easily used than the latter, although the latter system is more recognizable to firefighters in locating structures. With these two systems, the state hopes to standardize address systems towards making them more useful for multiple purposes and to measure their effectiveness.

CHAPTER 9 Resources

Addressing projects by their nature are labor-intensive endeavors which require both technical skills and geographic knowledge about one's community. As with many local undertakings that find no funding by federal or state governments, creativity is necessary to securing resources. Throughout the handbook, resources alluded to have generally fallen into either the financial or technical assistance categories.

Financial Assistance

No federal or state funds are specifically allocated for addressing projects at the time this Handbook was published. Addressing projects may be considered for funding under the umbrella of state traffic safety funds through local or regional EMS projects. The Small Cities Program under the Community Development Block Grant can also fund 9-1-1 related operations, to which addressing is directly related. The financing of most addressing projects has been a combination of funds from utilities, from 9-1-1 districts, and from city and county governments. And not to underestimate the value of donated services from volunteer service organizations and "borrowed" staff and office space from various agencies such as appraisal districts. With a combination of these resources, it is possible to complete an addressing project.

Technical Assistance

Texas is fortunate to have no shortage of consultants with experience in computers and geographic information system software, and who can provide project assessment and customized software programs. Some consultants will provide a turn-key job while others may perform only selected phases of an addressing project. Rather than list these vendors here, it is recommended, at minimum, to get referrals from perhaps city or county government staff or their state trade associations.

Cities can provide:
- Maps, newly annexed property information, and delineation of extraterritorial jurisdiction.
- Municipal guidelines on addressing from planning and zoning staff; also, general operations information is available should there be interest in expanded use into a GIS.

69

Counties can provide:
- Approved plats, maps and other information utilized by county government through offices of the county clerk, county tax assessor, county engineer, and the public works division.

Central Appraisal Districts can provide:
- Property maps, information, such as property lines, easements, property use, and in some districts, mapping capability.
- Computer capability with file structuring, file/data extraction, and other computer expertise.

Regional Councils of Governments can provide:
- Regional 9-1-1 planning staff assistance, access to other regional data for Census, transportation, and emergency services. Selected regional councils may have access to a minicomputer or mainframe.

9-1-1 Emergency Communication Districts can provide:
- Addressing data for service area and knowledge of databases.

State Agencies have or can access information on:
- Texas Natural Resources Information System (TNRIS) can provide information about:
  - Census TIGER Line Files
  - Landsat Imagery, NASA/Skylab High-Altitude Aerial Photography and Microfilm
  - U.S.G.S., U.S.D.A. Aerial Mapping Photography

- Special aerial photography projects initiated by state agencies, such as the State Department of Highways and Public Transportation, Texas General Land Office, and the Texas Water Commission.

- State Department of Highways and Public Transportation has general sign and map information through their Traffic Safety Division or Maintenance and Operations Division, both in Austin.

Federal Agencies have or can access information on:
- U.S. Postal Service has access to postal route maps for their carrier and knowledge of regional postal service area.

- Bureau of Census maintains national demographic data and digitized map files.

Postal Service Address Information Systems Contacts

U.S. Postal Service
National Address Information Center
6060 Primacy Pky. Ste. 101
Memphis, TN 38188-0001
1-800-238-3150
Document: Postal Addressing Standards

CITY NUMBER	CONTACT	ADDRESS	P H O N E
Austin	------------	8225 Cross Drive Austin, TX 78710-9321	512/929-1425
Corpus Christi	Billy Hunter	809 Nueces Bay Blvd. Corpus Christi, TX 78469-9321	512/289-9139
Dallas	Terrence Rockett	401 DFW Turnpike Dallas, TX 75260-9321	214/948-2785
El Paso	Sandra Chiquito	5300 E. Paisano Drive El Paso, TX 79910-9321	915/775-7539
Ft. Worth	Frank Perez	4600 Mark IV Parkway Ft. Worth, TX 76161-9321	817/885-1367
Houston	Joe Triola	401 Franklin St., Room 504 Houston, TX 77201-9321	713/226-3474
Lubbock	Troy Gardner	1515 Avenue G Lubbock, TX 79402-9321	806/762-7823
San Antonio	Trudy Messick	10410 Perrin Beitel Road San Antonio, TX 78284-9321	512/657-8513
Tyler	Becky McVicar	P.O. Box 9600 Tyler, TX 75711-9600	214/595-1141
Waco	Larry Griffith	430 West State Highway 6 Waco, TX 76702-9321	817/757-6527

USPS Suffix Codes

The following is a list of abbreviations for street designators as included in the NENA Data Standards Subcommittee recommendations. The list reflects the official USPS suffix codes with the elimination of duplicates.

Street Suffix Abbreviation	USPS Suffix	Street Suffix Abbreviation	USPS Suffix	Street Suffix Abbreviation	USPS Suffix
ALLEY	ALY	CIRCLES	CIR	FALLS	FLS
ANNEX	ANX	CLIFF	CLFS	FERRY	FRY
ARCADE	ARC	CLIFFS	CLFS	FIELD	FLD
AVENUE	AVE	CLUB	CLB	FIELDS	FLDS
BAYOU	BYU	CORNER	COR	FLAT	FLT
BEACH	BCH	CORNERS	CORS	FLATS	FLT
BEND	BND	COURSE	CRSE	FORD	FRD
BLUFF	BLF	COURT	CT	FORDS	FRD
BLUFFS	BLF	COURTS	CTS	FOREST	FRST
BOTTOM	BTM	COVE	CV	FORESTS	FRST
BOULEVARD	BLVD	COVES	CV	FORGE	FRG
BRANCH	BR	CREEK	CRK	FORGES	FRG
BRIDGE	BRG	CREST	CRES	FORK	FRK
BROOK	BRK	CRESCENT	CRES	FORKS	FRKS
BROOKS	BRK	CROSSING	XING	FORT	FT
BURG	BG	DALE	DL	FREEWAY	FWY
BURGS	BG	DAM	DM	GARDEN	GDNS
BYPASS	BYP	DIVIDE	DV	GARDENS	GDNS
CAMP	CP	DRIVE	DR	GATEWAY	GTWY
CANYON	CYN	DRIVES	DR	GLEN	GLN
CAPE	CPE	ESTATE	EST	GLENS	GLN
CAUSEWAY	CSWY	ESTATES	EST	GREEN	GRN
CENTER	CTR	EXPRESSWAY	EXPY	GREENS	GRN
CENTERS	CTR	EXTENSION	EXT	GROVE	GRV
CIRCLE	CIR	FALL	FALL	GROVES	GRV

Street Suffix Abbreviation	USPS Suffix	Street Suffix Abbreviation	USPS Suffix	Street Suffix Abbreviation	USPS Suffix
HARBOR	HBR	LIGHTS	LGT	PATHS	PATH
HARBORS	HBR	LOAF	LF	PIKE	PIKE
HAVEN	HVN	LOCK	LCKS	PIKES	PIKE
HEIGHT	HTS	LOCKS	LCKS	PINE	PNES
HEIGHTS	HTS	LODGE	LDG	PINES	PNES
HIGHWAY	HWY	LOOP	LOOP	PLACE	PL
HILL	HL	LOOPS	LOOP	PLAIN	PLN
HILLS	HLS	MALL	MALL	PLAINES	PLNS
HOLLOW	HOLW	MANOR	MNR	PLAZA	PLZ
INLET	INLT	MANORS	MNR	POINT	PT
ISLAND	IS	MEADOW	MDWS	POINTS	PT
ISLANDS	ISS	MEADOWS	MDWS	PORT	PRT
ISLE	ISLE	MILL	ML	PORTS	PRT
ISLES	ISLE	MILLS	MLS	PRAIRIE	PR
JUNCTION	JCT	MISSION	MSN	RADIAL	RADL
KEY	KY	MOUNT	MT	RANCH	RNCH
KEYS	KY	MOUNTAIN	MTN	RANCHES	RNCH
KNOLL	KNLS	NECK	NCK	RAPID	RPDS
KNOLLS	KNLS	ORCHARD	ORCH	RAPIDS	RPDS
LAKE	LK	OVAL	OVAL	REST	RST
LAKES	LKS	PARK	PARK	RIDGE	RDG
LANDING	LNDG	PARKS	PARK	RIDGES	RDG
LANE	LN	PARKWAY	PKY	RIVER	RIV
LANES	LN	PASS	PASS	ROAD	RD
LIGHT	LGT	PATH	PATH	ROADS	RD

(continued)

Street Suffix Abbreviation	USPS Suffix	Street Suffix Abbreviation	USPS Suffix
ROW	ROW	TRAIL	TRL
RUN	RUN	TRAILER	TRLR
SHOAL	SHL	TRAILS	TRL
SHOALS	SHLS	TUNNEL	TUNL
SHOAR	SHR	TURNPIKE	TPKE
SHOARS	SHRS	UNION	UN
SHORE	SHR	UNIONS	UN
SHORES	SHRS	VALLEY	VLY
SPRING	SPG	VALLEYS	VLY
SPRINGS	SPGS	VIADUCT	VIA
SPUR	SPUR	VIEW	VW
SPURS	SPUR	VIEWS	VW
SQUARE	SQ	VILLAGE	VLG
SQUARES	SQ	VILLE	VL
STATION	STA	VISTA	VIS
STRAVENUE	STRA	WALK	WALK
STREAM	STRM	WALKS	WALK
STREET	ST	WAY	WAY
STREETS	ST	WAYS	WAY
SUMMIT	SMT	WELL	WLS
TERRACE	TER	WELLS	WLS
TRACE	TRCE		
TRACES	TRCE		
TRACK	TRAK		
TRACKS	TRAK		

REGIONAL COUNCILS

Alamo Area Council of Governments
118 Broadway, Suite 400
San Antonio, Texas 78205
512/225-5201
9-1-1 Coordinator: Mr. Nolan Suarez

Ark-Tex Council of Governments
P. O. Box 5307
Texarkana, Texas 75505
214/832-8636
9-1-1 Coordinator: Mr. John Basile

Brazos Valley Development Council
P. O. Box 4128
Bryan, Texas 77805-4128
409/776-2277
9-1-1 Coordinator: Ms. Anita Pitt

Capital Area Planning Council
2520 South IH-35, Suite 100
Austin, Texas 78704
512/443-7653
9-1-1 Coordinator: Mr. Manny
    Fernandez

Central Texas Council of Governments
P. O. Box 729
Belton, Texas 76513
817/939-1801
9-1-1 Coordinator: Mr. Jim Oborski

Coastal Bend Council of Governments
2910 Leopard Street
Corpus Christi, Texas 78408
512/881-9911
9-1-1 Coordinator: Ms. Jay Nelson

Concho Valley Council of Governments
P. O. Box 60050
San Angelo, Texas 76906
915/944-9666
9-1-1 Coordinator: Ms. Hilda Arredondo

Deep East Texas Council of
Governments
274 East Lamar Street
Jasper, Texas 75951
409/384-5704
9-1-1 Coordinator: Mr. Steve Smith

East Texas Council of Governments
Stoneridge Plaza Office Bldg.
3800 Stone Road
Kilgore, Texas 75662
214/984-8641
9-1-1 Coordinator: Mr. Gary Price

Golden Crescent Regional
  Planning Commission
P. O. Box 2028
Victoria, Texas 77902
512/578-1587
9-1-1 Coordinator: Mr. Robert Kirk

75

COMMUNICATION DISTRICTS

Mr. Deloss Edwards
Fire Chief
Abilene/Taylor County
  9-1-1 District
140 Mulberry St.
Abilene, Texas 79601

Mr. Dennis Diggs
Austin County Emergency
  Communications Districts
P. O. Box 311
Bellville, Texas 77418

Mr. Jerry Marshall
Executive Director
Bexar Metro 9-1-1 Network District
10715 Gulfdale, #180
San Antonio, Texas 78216

Mr. Jeff Haislett
Executive Director
Brazos County Emergency
  Communications District
P. O. Box 2291
Bryan, Texas 77806

Mr. Henry J. Barber
Director of EMS
Calhoun County 9-1-1 Emergency
  Communications District
216 E. Mayhan Street
Port Lavaca, Texas 77979

Mr. Carlos Acevedo
Executive Director
Cameron County Emergency
  Communications District
513 E. Jackson, Ste. 323
Harlingen, Texas 78550

Mr. Bill Munn
Executive Director
Denco Area 9-1-1 District
1660 S. Stemmons, #295
Lewisville, Texas 75067

Mr. John Roudebush
Executive Director
El Paso County 9-1-1 Emergency
  Communications District
911 N. Raynor
El Paso, Texas 79903

Mr. Les Blalock
Police Lieutenant
Emergency Communications District
  of Ector County
205 N. Grant Avenue (POB 4398)
Odessa, Texas 79761

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78

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80

GLOSSARY

Base Line: Lines which divide the geographic area into identifiable sectors, usually on an east-west, north-south arrangement. These lines intersect at the Reference Point.

Base Map: For addressing purposes, a map to reflect existing street numbers and street names as well as other mapping features such as governmental boundaries. This map should be of adequate scale to add a grid overlay showing placement of block lines and chosen divider axis such as north-south and/or east-west street (railroad line, body of water, or other marker) quadrant or segment location.

Block Interval: Designated property frontage distance in block increments used as a basis for spacing address numbering. Interval usually is the 100 number.

Database: A set of compiled records containing information. In the context of addressing, street names and numbers serve as the basic record within a database to which other information may be linked. A telephone book is an example of a database.

Extraterritorial jurisdiction: Known in its abbreviated form as "ETJ", this is the unincorporated area contiguous to the corporate boundaries of a municipality. Under Texas law, the "ETJ" ranges from one-half mile up to five miles in width, depending on a city's population.

Frontage Unit: A standard interval in property footage which is used to measure placement of consecutive street numbers. Placement starts at the grid line and moves outward from the base line.

Geographic Information System: A collection of computer programs operating with a database which contains digital map data expressed in spatial coordinates. A GIS is capable of analyzing and synthesizing data to express new information in spatial and attribute form.

Number Assignment: Placement of consecutive numbers on existing structures and property based on street where entrance or driveway falls. For undeveloped property, numbering can be assigned based on the legal description with same interval used, allowing for future growth.

Reference Point: Fundamental to a numbering system, this point may be thought of as the intersection of two imaginary lines, like the point of origin on a graph.

Subaddress: Multiple-family buildings, such as apartments, duplexes, garage apartments, needing numerical or letter suffixes added to distinguish individual units.

Undeveloped Property: Property lots or tracts which are not subdivided and which are vacant or idle.Cities can provide:

- Maps, newly annexed property information, and delineation of extraterritorial jurisdiction.
- Municipal guidelines on addressing from planning and zoning staff; also, general operations information is available should there be interest in expanded use into a GIS.