

**Attachment F**

**NCTCOG GIS Requirements**

**North Central Texas Council of Governments**  
**Requirements for Database & GIS Maintenance**  
**September 1, 2010– August 31, 2011**

The County shall coordinate 9-1-1 GIS activities within the County and municipalities in the County to develop and enhance the 9-1-1 GIS coverage required for mapped ALI. The coordinator must develop, compile and maintain current, seamless Countywide coverage for street centerlines, address points, ESNs, 9-1-1 communities and city limits in both the incorporated and unincorporated areas of the County.

The County shall provide to the NCTCOG 9-1-1 GIS analyst data with 100% complete attribution for all map graphics with the following information:

- Street centerlines spatially accurate to within + or – 10 feet verified by GPS and drawn or pointing in the correct direction for the corresponding address range;
  - The following data at a minimum will be incorporated:
    - Pre-directional
    - Street Name
    - Type
    - Post Directional
    - 9-1-1 Community Boundary both left and right
    - Address Ranges (left from, right from, left to, right to)
    - ESN Boundary both left and right
    - County Boundary
- Addressed structure center points spatially accurate to within + or – 25 feet;
  - The following fields at a minimum will be incorporated:
    - Structure Number
    - Structure Street Name
    - Structure 9-1-1 Community Name
    - Latitude Coordinate
    - Longitude Coordinate
- ESN polygons spatially accurate to within + or – 50 feet of their true location
  - The following fields at a minimum will be incorporated:
    - Emergency Service Number (ESN)
    - Law Responders
    - Fire Responders
    - Medical Responders
- 9-1-1 Community polygons spatially accurate to within + or – 50 feet of their true location.
  - The following fields at a minimum will be incorporated:
    - 9-1-1 Community Name

- City Limit polygons spatially accurate to within + or – 50 feet of their true location.
  - The following fields at a minimum will be incorporated:
    - City Name
    -
- Common place points spatially accurate to within + or – 50 feet of their true location.
  - The following fields at a minimum will be incorporated:
    - Common Place Name
    - Common Place Type

The County shall send GIS data for street centerlines, address points, ESNs, 9-1-1 Communities and city limit boundaries, at least quarterly to the NCTCOG 9-1-1 Program. All files submitted to NCTCOG must be in ESRI shape file or geodatabase format.

The County shall resolve conflicts and problems related to the 9-1-1 GIS data maintained by County. If any issue regarding the GIS data arises which the County cannot resolve on its own, the County must contact NCTCOG within five business days in order to determine the best course of action to resolve the issue.

The County shall comply with NENA Standards on current and all future addressing and map data.

The County shall submit database maintenance plan and budget incorporating all NCTCOG 9-1-1 program requirements, as well as local activities, at the beginning of each fiscal year.

The County shall be responsible for submitting and maintaining quarterly budget reports with required documentation to the NCTCOG 9-1-1 Fiscal Analyst. These reports are due to the NCTCOG 9-1-1 fiscal analysts by the 10th day of each month following the end of the quarter.

The County shall at a minimum; back up weekly on a removable media all critical 9-1-1 GIS mapping files, coverage, and related data (street centerlines, address points, ESNs, and city limits) and store the removable media in a secure place.

The County will attend regularly scheduled meetings at NCTCOG.

The County shall meet all of the requirements set forth in CSEC Rule 251.9 – Guidelines for Database Maintenance.

The addressing agent shall track County commissioner's court and city council meetings that relate to development and improvement of GIS implementation for emergency services delivery. If an issue arises where either the County commissioner's court or city council takes a course of action that would interfere with or be inconsistent with the data development and maintenance procedures followed by the County, the County must notify NCTCOG in writing within two business days in order to facilitate the development of an appropriate response.

The County shall resolve any discrepancies between GIS layer databases and the MSAG database, as determined necessary by NCTCOG through its regular validation testing. Upon correction of any identified errors, the County will notify NCTCOG 9-1-1 Program, in writing, that the discrepancies have been corrected and will be included on the next update.

The County shall resolve any discrepancies between GIS layer databases and the information displayed at the PSAP as reported by a call taker. Upon correction of any identified errors, the County will notify NCTCOG 9-1-1 Program, in writing, that the discrepancies have been corrected and will be included on the next update.

#### GIS Accuracy Based Reimbursement

NCTCOG shall provide reimbursement to mapping entities in an effort to alleviate and/or severely reduce the number of MSAG to GIS database mismatching records. NCTCOG's goal is to achieve 98% accuracy within the fiscal year 2011 of the reimbursement program.

In the fiscal year 2011 the program will focus on reducing mismatching records by establishing funding levels for each county. The error rate will be broken into two categories; county and city. Quarterly targets shall be established and monitored monthly to ensure the effort is on track.

In cases where the rate of improvement does not track with achieving the 98% target, corrective action will be discussed with the county. This may include using allocated reimbursement funds to obtain outside help to meet the target.

NCTCOG's annual reimbursement to mapping entities shall be divided into four categories: Maintenance (Base), Maintenance (Variable), Remediation and Projects.

NCTCOG shall fund each category with the approximate percentage of available funds shown below:

<b>Category</b>	<b>Percentage</b>
Maintenance Base	25
Maintenance Variable	25
Remediation	42
Projects	8

### Maintenance (Base)

Each GIS entity within NCTCOG's GIS program shall continue to receive a reimbursement to support new address and streets added to the database. This is considered the Maintenance (Base) reimbursement<sup>1</sup>.

Funds from this category will be distributed equally among counties. The calculation shall be:

$$\text{Reimbursement} = \frac{\text{Category Funding Total}}{\text{Number of Counties}}$$

### Maintenance (Variable)

This category is established to provide additional reimbursement based on the number of database records.

The county shall be reimbursed based on its proportional share of the total regional records. The calculation shall be:

$$\text{Reimbursement} = \frac{\text{Record Count}}{\text{Regional Record Count}} \times \text{Category Funding Total}$$

### Remediation

The remediation category provides reimbursement for the effort required to bring the GIS databases in the county and cities within the county to the 98% accuracy objective.

The county shall be reimbursed its weighted share based on the percentage of records (including county and city databases) mismatching as of the beginning of the fiscal September 1, 2010.

$$\text{Reimbursement} = \left( \frac{\text{Record Count}}{\text{Regional Record Count}} \times \frac{\text{Mismatched Record Count}}{\text{Record Count}} \right) \times \text{Category Funding Total}$$

<sup>1</sup> All record counts include the sum of county and city records unless otherwise specified.

## Projects

Projects submitted by the counties are established to improve city database accuracy to meet the 98% objective. The process below shall be used:

1. NCTCOG shall provide database statistics to the county to include:
  - a. Total number of regional records
  - b. Total number of county records
  - c. Total number of city records within the county
  - d. Percent mismatch in the county database
  - e. Percent mismatch in the database for each city within the county
2. The county shall establish a project plan identifying city database(s) involved, the process for resolving mismatches, specific improvement targets and the process for ongoing maintenance of the data.
3. NCTCOG shall set-up Project Kickoff meeting where the overall reimbursement plan will be presented and discussed. All counties and cities shall be invited.
4. The county shall execute the project plan including results in the aforementioned monthly report to NCTCOG.

NCTCOG shall monitor the county reports to determine results are on track to meet the overall objective. Should the results indicate targets are not being met, NCTCOG shall contact the county to discuss progress and a remedial plan to get back on track. This remedial plan may include utilizing funds to acquire outside assistance.

**Requirements for GIS & Database Maintenance**  
**Effective April 1, 2009**

**Introduction**

Geographic Information Systems has redefined emergency response over the last decade. It is now assumed that a 9-1-1 call placed from a traditional land-line telephone can be plotted on a map automatically and wireless callers can be pinpointed accurately. The need for accurate GIS data is even more critical because it is no longer used solely for display on a screen as a visual cue for a dispatcher to evaluate and determine the appropriate responders. GIS is now beginning to drive the actual routing of emergency calls, which before were hard-coded entries in a database. GIS has taken a lead role in defining emergency response for the coming decades.

In reviewing the National Emergency Number Association (NENA) best practices documentation<sup>1</sup>, the Texas Commission On State Emergency Communications (CSEC) Recommended Best Practices for GIS and Mapping<sup>2</sup> and the findings of a process and data audit performed by L. Robert Kimball and Associates, consultant to the 9-1-1 program, NCTCOG endorses the minimum GIS requirements and through the following paragraphs, incorporates them into the Agreement between NCTCOG and the County as an amendment.

**GIS Requirements:**

The Commission on State Emergency Communications' (CSEC) requires local addressing programs to follow the state's Recommended Best Practices for 9-1-1 GIS and Mapping<sup>2</sup>, Module VI. Map Base Layers and Data Fields, are required to be followed to meet the Minimum Map Base Layers (road network, political boundaries [incorporated cities and MSAG communities], and ESZ boundaries) and for the address structures Recommended Map Base Layer. Together, these GIS layers form the Core GIS Layers that support optimum addressing activities throughout the region. In an attempt to stay up to date and to provide as much assistance as possible, NCTCOG encourages the counties to forward this data at least quarterly to NCTCOG's 9-1-1 Program using any currently supported ESRI data format. It is suggested that the counties, at a minimum, back up the Core GIS Layers weekly.

To assure accurate and complete GIS information, it is necessary to follow CSEC's Recommended Best Practices for 9-1-1 GIS and Mapping<sup>2</sup>, Module VII. Database. Attribution of the Core GIS Layers containing address information (road network and address structures) must match the related Master Street Address Guide (MSAG) fields.

CSEC's Recommended Best Practices for 9-1-1 GIS and Mapping<sup>2</sup>, Module V. Positional Accuracy specifies the positional tolerance of map data to be within 33 feet of the actual location. NCTCOG requires that all new data be created within

these recommended tolerances. Legacy data that appears to violate the positional tolerance standard when viewed against current aerial imagery should be adjusted using the current aerial imagery or GPS (Global Positioning System) capable of satisfying the requirements.

- **Road network:** NCTCOG strongly encourages a bi-directional capture of Street Centerlines comprising the road network. Driving both up and down each street segment in either direction will improve the accuracy of the road network that is used in all of the region's PSAPs.
- **Address structures:** Accuracy in 9-1-1 caller location and response time can be improved greatly when an address structure location is captured using a GPS. The X,Y coordinate makes for increased accuracy of Address Location Information (ALI). Methodology will include the capture of a point at the entrance of the driveway of every structure. It is highly recommended that the point later be spatially adjusted in the GIS by moving the point to the rooftop of the structure in accordance with recommendations by L.R. Kimball and Associates.

In accordance with recommendations by L.R. Kimball and Associates, NCTCOG's 9-1-1 Program requires maintenance and preservation of spatial relationships between features sharing coincident geometry. For example, Municipal Boundaries partially define Emergency Service Zone (ESZ) boundaries, and where this happens, the polygons should precisely match each other vertex-by-vertex. Another example is where segments of the road network define municipal boundaries. Where this happens, the polygon should precisely follow the road network segments vertex-by-vertex. Other spatial relationships that must be preserved are street intersections. Where a road network segment intersects with at least one additional road network segment, all segments must converge at the same node. Likewise, road network segments must be split at the precise boundaries of counties, cities, Master Street Address Guide (MSAG) communities (if applicable), ESZ boundaries and postal boundaries, and the ends of the resulting segments must converge at the same node.

In accordance with recommendations by L.R. Kimball and Associates, NCTCOG's 9-1-1 Program requires the inclusion of driveways (with proper attribution) in the road network layer under the following circumstances: 1) the driveway is over 500 feet long, or 2) a structure that is accessed by the driveways is obscured when viewed from the road.

The County's Current Addressing Processes documentation must be available for review by county employees, elected county officials, and county residents upon request. At a minimum, the Current Addressing Processes will include:

- The County's Addressing Policy, which includes the addressing scheme and road naming conventions in use by the County
- Documentation of known violations of the County's addressing policy sufficient to abrogate the County Addressing Coordinator and NCTCOG from liability

- Updated contact information for local addressing authorities
- Addressing policies in use by other local addressing authorities within the County

NCTCOG's 9-1-1 Program strongly recommends that County permitting processes require the County Addressing Coordinator to reject proposed street names on final development plats (and optionally preliminary development plats) that are in violation of the County's Addressing Policy. Additionally, the County Addressing Coordinator should assign addresses on the final development plat prior to its approval. Developers should provide the Addressing Coordinator with a paper copy of the final development plat and a geo-referenced Computer Aided Drafting (CAD) file or ESRI shape files. If changes are made to the as-built plat, they should be communicated to the Addressing Coordinator, so that the map may be accurately revised.

NCTCOG encourages the County to maintain a list of contacts of all local addressing authorities within the county. NCTCOG's 9-1-1 Program or the County will host meetings at the County to discuss issues affecting GIS and 9-1-1 addressing, such as recent or future growth, boundary disputes, addressing practices, or aerial imagery acquisition. Meetings will be held annually at a minimum, and the County Addressing Coordinator or NCTCOG 9-1-1 Program will be responsible for sending invitations. In coordination with the NCTCOG 9-1-1 Program, the County will be responsible for setting the agenda, and documenting participation, and following up on issues raised by meeting attendees. Invitees should include the local addressing authorities, GIS staff within cities and the County, and any other persons deemed necessary by any city, or the County.

It is recommended that communications take place regularly between the Addressing Coordinator and any relevant addressing personnel from the cities. The purpose of the meetings is to address any addressing issues that may be of concern to all parties.

Conflicts and problems related to the 9-1-1 GIS data maintained by the County should be resolved by the County, if at all possible. If any issue regarding the GIS data arises which the County cannot resolve, the County should contact NCTCOG for assistance in order to help determine the best course of action.

It is the County's responsibility to resolve any discrepancies between the Core GIS Layers and the information displayed at the PSAP, as reported by a call taker. Upon correction of any identified errors, the County will notify NCTCOG's 9-1-1 Program in writing that the discrepancies have been corrected and will be included in the next update.

The County should provide city boundary updates to NCTCOG's 9-1-1 Program when they are communicated to the County.

The County is requested to annually validate and document Fire District and Emergency Medical Service boundaries, and provide updates to NCTCOG's 9-1-1 Program.

**Database Requirements:**

It is important for the County to meet all of the requirements set forth in the Texas Administrative Code TITLE 1 (Administration) PART 12 (Commission on State Emergency Communications) CHAPTER 251 (Regional Plans--Standards) RULE §251.9 Guidelines for Database Maintenance Funds<sup>3</sup>.

In accordance with CSEC Rule 251.9 – Guidelines for Database Maintenance<sup>3</sup>, the County shall submit a database maintenance plan and budget incorporating all NCTCOG 9-1-1 program requirements, as well as local activities, at the beginning of each fiscal year.

In accordance with CSEC Rule 251.9 – Guidelines for Database Maintenance<sup>3</sup>, the County will be responsible for submitting and maintaining quarterly budget reports with required documentation to NCTCOG's 9-1-1 fiscal analyst. These reports are due to NCTCOG's 9-1-1 fiscal analysts by the 10th day of each month following the end of the quarter.

The County Addressing Coordinator is strongly encouraged to attend regularly scheduled meetings at NCTCOG.

The County will resolve any discrepancies between the MSAG database and the GIS, as determined necessary by NCTCOG through its regular validation testing. Upon correction of any identified errors, the County will notify NCTCOG's 9-1-1 Program, in writing, that the discrepancies have been corrected and will be included in the next update.

The Addressing Coordinator should track County Commissioner's Court and City Council meetings that relate to development and improvement of GIS implementation for emergency services delivery. If an issue arises where either the County Commissioner's Court or City Council takes a course of action that would interfere with or be inconsistent with the County's Current Addressing Processes, the County must notify NCTCOG in writing within two business days in order to jointly develop an appropriate response.

<sup>1</sup>[http://www.nena.org/media/File/02-014\\_20070717.pdf](http://www.nena.org/media/File/02-014_20070717.pdf)

<sup>2</sup><http://www.911.state.tx.us/files/pdfs/CSEC%20GIS%20and%20Mapping%20BP%20FINAL%20Commission%20Approved.pdf>

<sup>3</sup>[http://info.sos.state.tx.us/pls/pub/readtac\\$ext.TacPage?sl=R&app=9&p\\_dir=&p\\_rloc=&p\\_tloc=&p\\_ploc=&pg=1&p\\_tac=&ti=1&pt=12&ch=251&rl=9](http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=1&pt=12&ch=251&rl=9)