

# INITIATING A REGIONAL STRUCTURES LAYER STEWARDSHIP PROGRAM IN CENTRAL FLORIDA

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## **Abstract**

A cooperative relationship between Federal, state, and local geospatial data producing agencies is essential for the efficient development of the National Spatial Data Infrastructure (NSDI) and the successful implementation of the National Map. The highest priority activity for the National Map is the collection of high-resolution framework data, which includes current “critical” structures data. In July 2008 the USGS, LYNX (Central Florida’s Regional Transportation Authority) and four Florida counties (Orange, Osceola, Seminole, and Volusia) engaged in a cooperative agreement to provide a regional model for a structures theme stewardship program. The partners agreed to modify existing practices and create standardized attribute fields for classification of existing structures datasets in accordance with the USGS Best Practices Data Model. Each agency also agreed to codify responsibilities for data updates and data publishing. This presentation discusses the operational approach, results, and implications for expanded employment of this initiative in the geospatial community.

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Data is one of the most critical components of a Geographic Information System. Quality data can be costly to create, time consuming to document, validate and maintain, and is absolutely indispensable for decision management and analysis, especially during emergency operations. It is also recognized that data collected as close to the source as possible is usually most accurate. It was because of this that LYNX, in partnership with several fellow members of the Central Florida GIS (CFGIS) data sharing initiative developed and implemented a model for critical structure data stewardship as a model for the region. The collaborating counties worked together to create standardized attribute fields for classification and other characteristics for structures data collected at the local parcel level. The datasets for each county, for the most part, already existed and for the purpose of this project were to be modified to include the U.S. Geological Survey (USGS)/Homeland Security Infrastructure Program (HSIP) classification breakdowns by type and code (FTYPE and FCODE fields)

([http://bpgeo.cr.usgs.gov/model/acrodocs/Poster\\_BPStructures\\_03\\_01\\_2006.pdf](http://bpgeo.cr.usgs.gov/model/acrodocs/Poster_BPStructures_03_01_2006.pdf)) for:

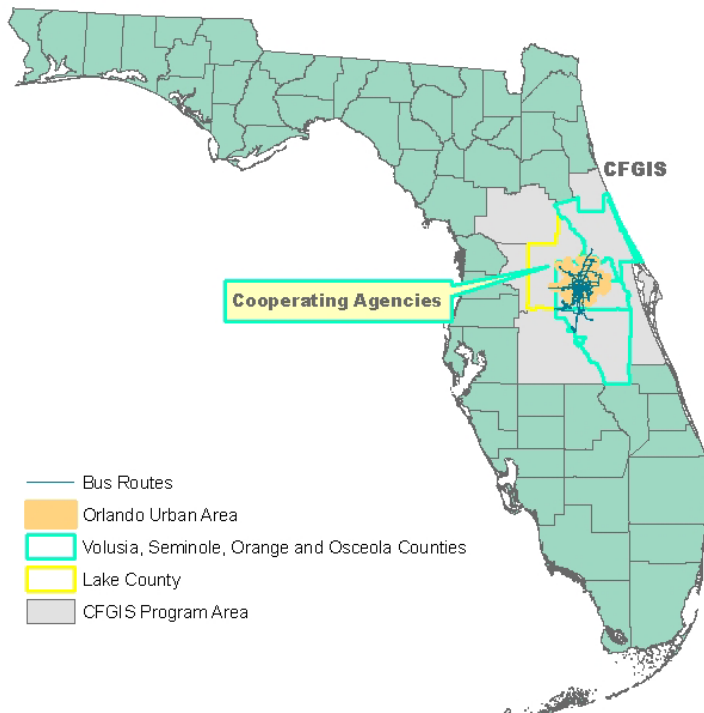
- Transportation facilities
- Government or military facilities
- Health or medical facilities
- Emergency response or Law enforcement facilities
- Banking or Finance facilities
- Information or communication facilities
- Energy facilities
- Water supply or treatment facilities
- Public attractions or landmark buildings
- Commercial or retail facilities (shopping centers, hotels, motels, etc.)
- Mail or shipping facility
- Building general – mobile home parks, multi-family dwelling
- Education facilities

The Central Florida GIS data sharing initiative was established in 2001 with the primary goal being to provide a forum for cooperation and collaboration for GIS users in the East Central Florida region. The program is managed and hosted by the East Central Florida Regional Planning Council (ECFRPC) and for a number of years was guided by the technical advice provided by a regional, cross-industries, Steering Committee. CFGIS and its ten member counties have achieved significant goals through volunteer work in

developing and maintaining the Central Florida GIS data clearing house ([www.cfgis.org](http://www.cfgis.org)), organizing regional user group meetings, sponsoring local training opportunities, and creating what has become a major annual regional workshop event for Central Florida. All project partners in the subject Structures collaborative effort were members of the CFGIS Steering Committee and included the GIS Managers from LYNX and the central Florida counties of Volusia, Seminole, Orange, and Osceola. Each of the named counties has successfully implemented strong GIS programs to coordinate GIS functions and activities between various departments and to actively share data across their organizations. Each also maintains centralized digital geospatial data repositories and provides web-based services to their internal and external users.

In support of statewide geospatial program coordination, LYNX and Volusia County GIS were members of the Florida GIS Strategic Plan Steering Committee. The Steering Committee's Strategic Plan development effort was funded through an NSDI Cooperative Agreements Program grant in 2007 with the goal of developing a Florida GIS Strategic Plan for GIS coordination. Chaired by the GIS Coordinator of the Florida Division of Emergency Management and with the assistance of the USGS Liaison to Florida, the Steering Committee identified the critical requirement for effective data sharing initiatives, especially for critical infrastructure data. The grant submission detailed here, was a direct result of several discussions that took place during the state strategic plan development process. It was a logical step to create a regional pilot on collaboration and coordination with minimal investment of resources and maximum understanding of the benefit. The East Central Florida region was a natural candidate for such a pilot due to the fact that Orlando, which is a high-priority HSIP Urban Area, extended over multiple counties and a well advanced regional cooperative climate was already in place.

LYNX – the Central Florida Regional Transportation Authority, served as the project lead for this Structures data collaboration initiative. As a regional agency, LYNX is responsible for providing transit services to residents and visitors within Orange, Osceola and Seminole counties. LYNX services include a fixed bus route network, paratransit demand response, vanpools, carpool matching and the LYMMO Bus Rapid Transit (BRT) system. The LYNX service area covers 2,500 square miles with a population of 1.7 million people and has a frequent need to aggregate regional data sets for analysis and route planning. As a regional entity, LYNX is required to process GIS datasets from the counties in its service area and create regional base map layers to support its internal and external users. LYNX was a natural lead for this Structures Stewardship project due the Transportation Authority's experience with GIS data sharing and



program effective collaboration. Each municipality and regional agency in the Central Florida area already maintained many facility data layers but with little or no attention given to regional sharing, generally creating information for their own purposes with little or no coordination with adjacent or higher agencies. Occasionally, regional agencies would aggregate their GIS data for a particular project driven task as needed, however, this often resulted in inconsistent levels of accuracy, naming conventions, and field attribution. Irregular update cycles and inadequate documentation further exacerbated this issue.

The deliverable from this regional Structures Stewardship project was to be a continuous point dataset with parcel level accuracy adhering

to the USGS best practices data structure model. The regional model included data fields containing latitude and longitude coordinates expressed in decimal degrees, U.S. National Grid coordinates, and a U.S. Census Tract ID value. Development of an established procedure for simultaneous annual data updates as well as defining a methodology for publishing the updated dataset to the National Map, the Florida Geographic Data Library, and the Central Florida GIS data clearinghouse were key components of this project. Data and metadata for the regional aggregated dataset and the local county datasets have been made available, as appropriate, through the Geospatial One-Stop (GOS) portal.

Each of the participating counties agreed to add to their existing attribute structure to support the regional data model adopted for this project. The data sharing and cross-boundary information would be easily accessible for emergency response and evacuation or for other cross boundary projects such as paratransit and fixed route trip planning from and to different points of interest. Implementing NSDI standards for all the partnering counties at the same time is the first effort for the East Central Florida Region to support aggregation of county data sets based on a nationally adopted standard. The success of this project was hoped to be a model, providing guidelines for sharing GIS datasets between different geographic areas and as an example for seamless local data integration.

Before starting the application process for the USGS Cooperative Assistance grant LYNX had to confirm the general interest from the potential partners to participate in this pilot. A draft Structures Stewardship project proposal was presented for comments and input from the participating GIS managers. This group also provided a list defining the available facility files to be shared, and confirmed their agency's commitment to the project.

Initially the team of participating GIS managers developed a proposal and applied for a grant under the NSDI Cooperative Agreements Program (CAP) grant series, however, the proposal was not chosen to receive funding. Nevertheless, this innovative regional Structures Stewardship approach to data sharing and collaboration was recognized by the USGS Eastern Region Partnership Office resulting in an award through that office.

A major goal of this project was to leverage current efforts and processes by modifying the format of existing Structures layer datasets. This was accomplished, in part, by promoting the project in terms of regional emergency management planning and mutual aid. This ensured a cost effective process for a regional data compilation effort while firmly affixing custodial responsibilities for a long lasting partnership.

The project plan was outlined for the grant proposal submission with the following milestones:

- I. Present the proposed data structure and USGS data model to participating counties. Meet with county GIS managers and Data Custodians responsible for the Structures layer data sets.
  1. Define the data available from each county, associated attribute scheme applied, spatial accuracy, and existence of documentation
  2. Define data sharing concerns (if any), update procedures employed, and maintenance schedule
  3. Propose and agree upon a data structure and an overall plan for data maintenance and updates
- II. Manipulate the existing structures data from each county to add the required fields from the USGS standard and create FGDC compliant metadata for each set
  1. Counties will provide Structures layer GIS data updates to LYNX.
  2. LYNX will provide an additional resource of student labor to assist in the modification of the attribute structure as needed
- III. Implement partnership agreements with all the participants responsible for data development to conform to the use of provided data models and submit annual dataset updates to LYNX
  1. The existing datasets with modified field structure to be adopted by the counties, documented and put on a scheduled update cycle in accordance with the regional plan
  2. LYNX to summarize data from all participating counties and create a continuous data set with all proposed standardized fields

3. LYNX facilitates development of appropriate FGDC compliant metadata
  4. LYNX publishes information to a public data domain via the Central Florida GIS clearing house, FGDL, the National Map, and GOS
- IV. Present the initiative, Structures layer data structure, and lessons learned at the Southeast Regional ESRI Users Group Conference, the Central Florida GIS Workshop, and the 2009 International ESRI Users Conference.

One of the basic questions that surfaced during the first team meeting was “what is “critical”? Criticality is different based on the threat or the level of importance of a facility. Literally any structure can be critical under the right circumstances. Because of this all point feature data sets were reviewed from each jurisdiction. Some existing layers were more easily modified in the short term than others, due to custodial requirements or jurisdictional linkages. These layers were highlighted for the initial effort with an acknowledgment that additional layers could be migrated following the same schema in the future.

Also raised was the issue of data sensitivity and public access. It was acknowledged that some Structures data is sensitive and this recognition required a modification to the fundamental project plan. These “sensitive” datasets would still be modified and available to appropriate emergency management agencies, and could be provided upon request and under existing procedures defined in advance, but will not be placed in the public domain.

Additional issues and questions arose regarding the content of the Federal HSIP-specific required fields, and inclusion of additional fields of potential value to the State of Florida. This additional content would be in support of the new Comprehensive Data Management System (CDMS) portal, designed to supply FEMA’s HAZUS-MH with local content. While the FType and FCode classification for all features in accordance with HSIP standards were clearly documented, the acceptable content of the “Local Unique ID” was not. It was determined by the team that this Local Unique ID value would be comprised of the Census State and County Identifier, the local dataset abbreviation, and a unique record number that would be maintained by the local data producing agency. For example 12127FAC101 would refer to the 101<sup>st</sup> record in the Volusia County, Florida facilities file. Several attributes were included by the team to provide additional flexibility for “translation” to other national and regional databases as well as for producing paper or digital map products for emergency response operations. These fields included U.S. National Grid coordinates, the Census TractID, and Latitude-Longitude coordinates.

Resulting from the high level of participation and interest on the part of the collaborating agencies, the initial scope of the project began to expand. The USGS Geospatial Liaison to Florida emphasized the critical significance of the Orlando urban area in the context of Federal homeland security program operations. It was communicated that if the Orlando Structures data layer resulting from this project was to be of real value to the Federal government, the entire urban area footprint, as defined by the National Geospatial Intelligence Agency, would need to be included in the project’s scope of work. In order to fulfill this requirement for completed coverage of the Orlando Urban Area a portion of eastern Lake County would need to be included. Communication and collaboration with Lake County GIS managers resulted in their participation in the initiative. The use of student interns managed by LYNX allowed for the creation and modification of the needed data layers to complete the initial deliverables for the wider geographic area. These modified Structure data sets were provided to Lake County GIS for subsequent maintenance.

The proposed Structures Stewardship project budget included funds for a workstation and associated ESRI GIS software for LYNX as the coordinating agency. This equipment was to be used to support on-site student labor employed to support final data processing and creation of the continuous Structures data layer. In addition, a portion of the federal funds supporting this project was directed to the participating counties by way of a one-time payment to assist in defraying costs associated with their ESRI annual maintenance contracts. Working with ESRI staff, LYNX entered into an agreement to pay ESRI and, in turn, ESRI credited each county accordingly.

The cooperative stewardship agreements resulting from this project will advance effective regional communication, will encourage geospatial data sharing, and will improve data access to critical GIS data layers. Perhaps the most significant accomplishment of this cooperative effort will be the agreements put in

place with the project partners to use the resulting data models and participate in annual dataset updates. Agreed upon non-restricted data sets will be shared and distributed through the public domain and the associated FGDC-compliant metadata will be maintained. Data maintenance and backup procedures will be documented in a partnership agreement with the USGS National Geospatial Program Office (NGPO) and the metadata will be made available through the Geospatial One-Stop portal. Each county will ensure its portion of the Structures layer data is regularly backed-up in accordance with their internal County IT SOPs.

The goals of this pilot project were met and the results are improved data sharing, and a standardized approach. In addition, the regional critical Structures layers were successfully updated and published prior to the 2009 Florida hurricane season. The goal now is to expand this initiative both in spatial extent and layer diversity throughout the Central Florida region. This goal could be achieved with minimal investment due to the availability of skilled college student labor resources and the supportive cooperative and collaborative attitude displayed by regional GIS professionals. As work continues, the regional team will strive to collaborate closely with the Florida Division of Emergency Management in an effort to support distribution of the regional Structures layer model schema throughout the State.

### **Acknowledgments**

This project was a success in part because of the exceptional support and enthusiasm of Lou Driber – USGS Liaison to Florida, Puerto Rico and the US Virgin Islands. He and his staff were always ready to provide advice and encouragement during every phase of the project. We would also like to recognize the special role of Richard Butgereit, GIS Administrator for the Florida Division of Emergency Management. His efforts on behalf of FDEM in the Florida implementation of the CDMS data portal, created to provide updated local data to HAZUS – MH, were coincidental with the timeline for this teams project. The free flow of information from and to FDEM was essential for the compilation of a regional dataset that is readily compatible with the requirements for the state data portal. Finally, this regional coordination effort would not have been possible but for the approval and support of the executive management of LYNX. Many thanks.

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