Preliminary Conceptual Plan

A Pilot Project By
Oklahoma State University Extension Service

For
Development and Utilization of
Geographic Information System Technology
For Public Officials in Rural Counties of Oklahoma

Introduction

-The Oklahoma State University Cooperative Extension Service through the Division of Agricultural Science and Natural Resources is initiating new program approach to assist Rural Counties of Oklahoma to adapt and use Geographic Information Technology currently employed by larger metropolitan Counties and Municipalities in the State of Oklahoma.

This conceptual plan will describe the needed political framework, communication network, organization approach, management structure, operations methodology, capability acquisition, capability maintenance, resource mechanism, and the milestones to accomplish this purpose.

Problem

-Rural Counties of Oklahoma compared to metro Counties not adapting/advancing GIS Technology

-Although GIS data is accessible through various State programs, the process to request and acquire data is often slow and costly

-State Programs emphasize limited generation of products for use by County and Local Officials but not offering sufficient methods for these Officials to obtain in-house capabilities to be GIS self-sufficient.

-Direct and timely use of GIS by County Managers and Public Officials to acquire data does not exist.

-Funding and support resources such as training and proactive technology transfer are not readily available to be GIS self-sufficient

Background

The Oklahoma State University Extension Service has been keenly aware that rural Counties of Oklahoma compared metro County are slow to adapt, advance, and use GIS Technology. This
awareness comes from our close observations working through our County Extension Service programs with each County of Oklahoma and working with those representative Public Officials. Scattered efforts have occurred among some Public Officials and private citizens to explore GIS utility and possible in-house capability for continued use. Most of these efforts lacked consolidated support and left many questions unanswered such as: 1. how this type of capability could be utilized; 2. how it could be sustained with funding; 3. who would manage such capability; and 4. how would this capability integrate with other state and local functions and capabilities?

The most recent activity sponsored by private citizens and some Public Officials in McCurtain County formed a project to demonstrate and evaluate GIS application products related to each participants needs and explored how this capability could be implemented on a shared bases within the County. The project acquired support from Lone Star College in Harris County Texas to build a GIS System containing all types data covering McCurtain County. This Support was obtained at no cost and was part of advanced course for GIS Certification. The data was collected from the State of Oklahoma, the US Forest Service, Census Bureau, US Agriculture, US Geological Survey, and Federal Management Emergency Administration, and others.

Although this project did build significant support for such a capability and did build a usable database for McCurtain County, it was unable to find the means to host this capability and integrate this capability into the County and State infrastructure. Once again, the lack of funding, the absence organizational ownership, and not having a good understanding to implement this operational capability was cause for failure to transfer of this technology to this County and its Public Officials.

Because of these types of failures, the OSU Extension Service is proposing a new approach that is proactive to accomplish the transfer of technology for continued, direct, and routine use of GIS data by rural County Public Officials.

**Primary Goal**
Promote and facilitate the advancement, establishment, and use of Geographic Information System Capabilities for Public Officials in rural Counties and Municipalities throughout the state of Oklahoma so that these Counties and Municipalities can eventually sustain the operations and maintenance these capabilities on their own.

**Objectives**
- Bring together and focus existing Federal, State, County, Municipal, and private resources to assist rural Counties and municipalities to demonstrate, evaluate, adapt and use GIS technology.
- Offer to rural Counties and municipalities the support resources such as training, state and federal database availability, technical and research assistance, assistance to access alternate funding sources, and organization/management assistance to eventually sustain GIS self-sufficiency.

**Overall Methodology**
The Oklahoma Cooperative Extension County offices are committed to Oklahoma communities, where County based Extension educators work side-by-side with residents to address local issues and concerns. County personnel can call upon state, district, and area Extension specialists who
develop programs based on science-based, objective information to help Oklahomans solve problems, promote leadership, and manage resources wisely. Our programs can focus on: increasing opportunities for economic development, technology development, natural resources, and environmental management issues in respective County throughout Oklahoma. Through this mission the newly proposed approach facilitates the needed communication, coordination, and planning amongst State and County organizations and their representatives to realize development and utilization of GIS technology in rural County of Oklahoma. It will promote the development and use of GIS capability and related technology in these Counties and support the County Public Officials, public interest groups, and small business to explore and develop GIS capability alternatives. This approach will foster a needed network of communication and agreements across various State and County governments to participate in the use of GIS Technology. This will facilitate the pursuit of available funding sources through this network and promote finding strategies to share resources.

The OSU Cooperative Extension Service through their County offices plans to become the source within any given rural County to promote and coordinate the development and use of GIS capability and related technology in rural Counties. It will support County Public Officials and public interest groups, and small business to explore and develop GIS capability alternatives through providing and maintaining shared GIS technology for this purpose and assist the County to find the most suitable alternative to acquire or share capabilities within the County. This methodology will develop a network of communication and agreements across various State governments to participate in the use of GIS Technology, pursue available funding sources through this network, and promote and find strategies to share resources. To achieve the objectives and establish this working methodology for rural Counties who are ready to pursue this technology, a Pilot Project with one County will be conducted to measure this success and find what works and doesn’t work before expanding the methodology to other Counties. The Pilot Project will help us determine how quickly we can support other Counties with these services.

We have selected McCurtain County as our test case before extending this support to other rural Counties. Further, McCurtain County located in Southeast Oklahoma and is surrounded by other rural Counties. These Counties of Southeast Oklahoma stand a good chance to be selected to receive project support after the pilot. These Counties are very similar economically and are located in a vast area of low-density population of vast recreation-outdoor opportunities. This area is dominated by large forestland tracks owned by large landholders and timber industries and the forest practices driven by market forces are beginning change. Many of these lands are now selling, rearranging, or changing their land use practices. Southeast Oklahoma is now being discovered and is forecasted to realize its growing economic potential. This changing scenario will require some latest information technology such as GIS to plan, manage, and keep pace with this new economic development.

**Overall Implementation Plan and Scope**

As the initial Pilot Project starts with McCurtain County, the recent GIS Technology demonstrations and evaluations conducted this year in that County gives the OSU Cooperative Extension Service an excellent head-start opportunity to capitalize on the GIS capability development already in place, the extensive geo-database that has been collected and organized, and a already participating user group. This should reduce
planning and organization efforts of the project, minimize needed technical development, and keep cost to minimum to complete the Pilot Project. This Pilot Project will began in early October 2009 and will continue through September of 2010 and will consist of 4 phases during this period. These 4 phases include project definition, system development and readiness, training, demonstration and evaluation. The 5th phase will take place near the conclusion of the 4 phases to measure the success of the Pilot Project. Based on lessons learned from the project, a working model will be developed used for transferring this GIS capability to other rural Counties and their Public Officials for their continued utilization.

The 1st phase – Definition and planning:
These activities include: The definition and planning of the Pilot Project including determining the level and type of participation and responsibilities of each participant implementing project; identifying those Public Officials to participate and benefit from the project; definition of system equipment, software, and training needed to conduct the demonstration; defining the user needs of this capability; defining further needed data and information to conduct the demonstrations and training of the project; and identify any specific technical obstacles needed further attention.

The 2nd phase – Systems development and operational readiness:
Activities include: the collection of all data and information; the acquisition of the needed equipment and software; the input of the data collection into the system; the integrated testing of the data with system; the collection of preliminary requirements for application queries provide by the public participants; performing the readiness of the system for further demonstration with these application queries; and establishing the detailed training procedures for user orientation and actual use of the capability.

The 3rd phase – Initial training, demonstration and evaluation:
This phase consists conducting orientation and detailed training in use of the GIS capability; establish and conduct initial demonstrations using the GIS application capability to the user participants based on each users application requirements; perform evaluations of the demonstration results by the participants; formulate any changes to existing query applications; and defining new query applications for further demonstration;

The 4th phase – Further training enhancement and additional demonstration and evaluation:
This Phase will include: the coordination and development of newly defined application queries and modify the existing application queries for the final demonstration to the Individual County participants; perform the need training to the user participants for the newly developed applications; conduct the final demonstration and evaluation of these application and related queries with the user participants; the demonstration of the transferable GIS Application System and the recommend setup requirements, operational procedures, overall cost, and available funding methods for a hosting a permanent facility of this GIS Capability.

The 5th phase – Performance measurement of the GIS capability and its utility applied to McCurtain County and the transferability to other rural County:
The 5th phase involves a thorough performance measurement activity of the Pilot Project results. This includes the system capability to satisfy individual user requirements and the overall
friendliness of the system to the user and the ease of operations to the hosting management within a rural County. Based on lessons learned from the project, this phase will develop and document a working model to use and transfer this GIS capability to other rural County and their Public Officials for their continued use. This will include the recommended transferable GIS Application System, the recommend setup requirements, operational procedures, the level and type of training needed, the hosting and management of the capability, overall cost, personnel requirements, funding requirements, and available funding methods for a hosting a permanent facility of this GIS Capability.

**Specific Tasks for the Pilot Project**

**Phase 1 tasks**

1. Define, Develop, and document the Pilot Project Plan to initiate and conduct GIS Technology adaptation and advancement for County governments, municipalities, public interest groups, and private sector/small business located in rural areas of Oklahoma.

2. Form a McCurtain County Users Group to coordinate and establish user needs for the project.

3. Establish the level and type of participation needed from Public Officials and identify those persons and their organizations and establish their specific support to this demonstration.

4. Assess current user requirement and application data and define new data that will be required for GIS capability demonstration and analysis.

5. Define system requirements for the system equipment and software needed to conduct the Pilot Project including the central geodatabase system and the user software application stations such ARCGIS 9.3, ARC Explorer, and MapWindows. This includes where the systems are located and the responsible parties for those systems.

6. Assess already available geodatabase information and identify further the needed user data and user information to conduct the Pilot Project demonstration.

7. Define levels and types of training for user participation that is required to use selected systems and software.

8. Define any technical issues and the level of support that is needed for further investigation during the project

**Phase 2 Specific Tasks**

1. Acquire and install the needed equipment and software defined in phase 1 for the geodatabase system and user application data stations

2. Input current and newly obtained data collected during phase 1 into the geodatabase system and perform the integrated testing and verification of that data with the system.
3. Collect both current requirements from the previous project and newly defined requirements for application queries as provided by the public participants.

4. Develop the detailed training scenarios with procedures both orientation and actual use of the GIS applications data stations.

5. Using current the application queries developed from the previous project; perform integrated test and verification of the GIS user application data stations using the acquired data from the geodatabase. This serves as readiness for further demonstrations required during phase 3.

6. Assess the utility of using free software such as Arc Explorer or Map Windows using these queries.

**Phase 3 Specific Tasks**

1. Conduct detailed training for user participants with their respective application queries. This includes both orientation and actual use of the GIS applications data stations.

2. Demonstrate the utility of the GIS capability and the GIS applications data stations to the County participants using previous developed application queries.

3. Assess these results using this capability and by formulate any changes to existing query applications and defining new query applications for further demonstration.

4. Conduct the development of newly defined application queries and modify the existing application queries for the final demonstration to the Individual County participants.

**Phase 4 Specific Tasks**

1. Conduct the development of newly defined application queries and modify the existing application queries for the final demonstration to the Individual County participants.

2. Conduct the final demonstration and evaluation of all these application queries.

3. Assess the specific benefits using each of the queries by providing potential cost savings and time saved using the query versus the previous methods of deriving this information.

4. Demonstrate this GIS Application System to all McCurtain County participants including County managers and budget/policy managers and provide the recommend setup requirements, operational procedures, potential overall cost, and available funding methods for a hosting a permanent facility of this GIS Capability.

**Phase 5 Specific Tasks**
1. Conduct a thorough performance measurement activity of the Pilot Project results. This includes system capability performance to satisfy individual user requirements and the overall friendliness of the system to the user and the ease of operations to the hosting management within a rural County.

2. Assess the overall completed Pilot Project tasks and determine what works and doesn’t work in the demonstration of this capability and factor these results to develop a friendly yet flexible transfer capability process that works for the various rural County and their unique application needs.

3. Develop and document a working “how to model” for utilization and transfer of this GIS capability to other rural County and their Public Officials for their continued use.

4. Develop and document a recommend options for a transferable GIS Application System,

5. Develop and document recommend setup requirements, operational procedures, the level and type of training needed, the hosting and management of the capability, overall cost, personnel requirements, funding requirements, and available funding methods for a hosting a permanent facility of this GIS Capability.

**User Participation**
The Pilot Project will allow any McCurtain County public offices, County public interest groups, Municipality offices, County public authorities, public districts, Federal and State Government offices, and private sector businesses to participate as users.
The following users were participating in recent demonstrations described in the Background paragraph of this document:
County Tax Assessors Office
County Tax Collectors Office
County Emergency Management & Medical Services Authority
Idabel Mayor Office
Idabel Industrial Authority Office
Idabel Chamber of Commerce
Broken Bow City Managers Office
Broken Bow Chamber of Commerce
Broken Bow School District
Idabel School District
Hochatown Volunteer Fire & Emergency District
Water District 5 Hochatown
McCurtain County National Bank
Additional Users will be pursued through this project

**Project Support Participants**
The Pilot Project anticipates project support with one or more contributions in areas of technical support, data release, equipment loans, analytical support, training support, donations in kind, database support, and other contributions
The following were support contributors on the previous project conducted this year and the project hopes to continue their needed support:
- Oklahoma Tax Commission - Data release and updates
- OU Center for Spatial Analysis – Data releases and updates
- OSU Center for geo-spatial information – Data releases and updates
- McCurtain County Tax Assessors Office - Tax Parcel data release and updates
- US Forest Service at Hochatown – Data release and consulting support
- Choctaw Electric Company – Data release and consulting support
- Oklahoma State Forestry Office at Broken Bow - Data release and consulting support
- Idabel Mayors Office – Data release and updates
- Broken Bow City Managers Office – Data releases and updates
- US Agricultural Stabilization Adm. – Data release and updates
- US Geological Survey - Data release and updates
- Oklahoma KEDDO (Southeastern Oklahoma Council of Governments) – Data Support and consulting support

Other additional sources of project support will be needed and identified for the Pilot Project:
- OSU Division of Agricultural Science and Natural Resources/Cooperative Extension Service – Hosting the geodatabase and Project Web page for all geospatial data distribution to the Pilot Project
- OSU Oklahoma Cooperative Extension Service – Pilot Project/Program Management and overall sponsorship
- McCurtain County Cooperative Extension Office – Pilot Project management/coordination
- OSU Department of Geography/Center for Geo-spatial Information –Further data release and technical assistance with GIS applications and training

- OU Center for Spatial Analysis – Further data releases and updates, technical assistance with GIS applications and training
- Oklahoma State Department of Commerce – Programs, communications, and, Funding strategy support.
- Oklahoma KEDDO (Southeastern Oklahoma Council of Governments) – Data Support, consulting support, shared task support.
The Phase 1 project definition activity will define additional support needed

**System Considerations for Pilot Project**
This preliminary system model, which we believe meets the needs of the McCurtain County users who want to use contemporary GIS methods and practices to select tracts or parcels of land, or identify land owners and Land related information, identify natural resources, census data, economic data, other data from various surface overlays, and monitor changes and development. This is considered a "pilot" project in McCurtain County, and if successful, it might be extended to surrounding County in Oklahoma. Thus, the need for a design that is expandable and manageable has been taken into account. Our preliminary model will include the themes and data developed by the previous demonstration project conducted in the first half of
2009. The data from this project is currently under evaluation by the Cooperative Extension Service as to its compatibility to be hosted within its own geodatabase system capability.

For the purpose of this Pilot Project this project data and other additional data obtained for project and used in this project will be managed, maintained and controlled by Cooperative Extension Service at OSU with the existing in-house geodatabase function. This is the baseline control of all data used in this project.

All data from this geodatabase will be accessible through a designated web page and can be downloaded by authorized user sources.

The geodatabase design will have components including the raster datasets and feature classes along with corresponding metadata and then a series of thematic layers with appropriate symbology and scaling.

The geodatabase will be constructed to facilitate identification of features and appropriate querying of attribute tables. An ArcMap document will be provided for client use, allowing thematic layers to be displayed and queried as desired.

This geodatabase is designed for using ARCGIS Desktop by ESRI as a user applications data work stations. Specific specification for the ARCGIS Desktop capability will be determined by the project based on user application needs. The project intends to use ArcExplorer where possible which is readily available at no cost. A thorough evaluation will be conducted during this project to determine how it can be used for most of the application queries. ARCGIS Desktop software licenses will be authorized for the McCurtain County Extension Office.

Additional licenses can be obtained from the OSU Extension Service Office for those users needing ARCGIS Desktop such as the McCurtain County Tax Assessors office and the County Emergency Management and Medical Service Authority. Other users may only need an ArcExplorer or MapWindows data work station for most of their applications uses, which is available at no cost and can be download form the ESRI web site. If these users occasionally warrant the use of a ARCGIS Desktop, this will be provided at the County Extension Office or other designated facility on a shared/scheduled basis.

The OSU Extension Service will install, test, and maintain all ARCGIS Desktop software for use by this Pilot Project.

Management Plan Consideration for the Pilot Project

The following are summary responsibilities for key organizations participating in this Pilot Project:

**OSU Cooperative Extension Service**

- Policy, Control, and Program Management Oversight of the Project
- Interagency Participation Control and Management Oversight
- Resources Control of the Project including Manpower and Funding
- Establishes, Controls, and Maintains the Geodatabase and Web Data Distribution
- Obtains, Controls, and Maintains All GIS System Equipment and Software
- Establishes, Controls, and Conducts All Training for County participants of the Project
- Controls, Coordinates Software and Procedure Development Support for County Participant Users for new application queries.
- Control, manages, and coordinates all special Technical Issue investigation tasks assignments
- Control and Management Oversight of All Project Plan Tasks
-Controls the Pursuit, management, and maintenance of All Grants from various sources supplied by the University and Other providers.
-Provide Project Management direction to Implement the Task Activities of the Project Plan

**County Cooperative Extension Office**
- Serves as Site Project Manager to Coordinate and Manage All the Task Activities of the Project Occurring and Located in County
- The Primary Interface Between all County User Participants and OSU Extension Service to Represent County Needs and Data Requirements
- Provide Status and Reporting of All Task Activities Occurring in the County
- Coordinate and Manage All GIS System Equipment and Software Administration and Maintenance Operations for the OSU Extension Service Project Manager

**OSU Dept. of Geography/Center for Geospatial Information**
- Provide Data Releases as Requested By the OSU Extension Service
- Provide Technical, Research, and Training Support when Requested by the OSU Extension Service Project Manager

**OU Center for Spatial Analysis**
- Provide Data Releases as Requested By the OSU Extension Service
- Provide Technical, Research, and Training Support when Requested by the OSU Extension Service Project Manager

**Oklahoma Tax Commission**
- Provide Data Releases and Updates as Requested By the OSU Extension Service

**McCurtain County Tax Assessors Office**
- Provide Tax Parcel Data Releases and Updates as Requested By the OSU Extension Service
- Perform Supporting Tasks such as Data Collection and or Shared Technical Support When Requested By the OSU Extension Service

**Oklahoma KEDDO (Southeastern Oklahoma Council of Governments)**
- Provide Data Release and Updates as Requested By the OSU Extension Service
- Perform Supporting Tasks such as Data Collection and or Shared Technical Support When Requested By the OSU Extension Service

**Oklahoma State Department of Commerce**
- Provide Programs, Intra-state Communications, and, Funding Strategy Support as Requested By the OSU Extension Service

**The State GIS Board for the State of Oklahoma**
- Provide Program Support for Feedback, Intra-state Communication, Policy Issue Recommendations, and Operational Strategies Requested By the OSU Extension Service
Schedule

- Request announcement letter for User participation -- Sep. 07, 2009
- Selection of User participants – Sep. 15
- Introduction meeting for new User Participants – Sep 21
- Establish specific participation support – Sep. 21 – Oct. 01, 2009
- General orientation training definition for participation—Oct. 01 - Oct. 15, 2009
- Conduct general orientation training – Oct. 21 – 22, 2009
- Initiate User needs and requirement definition – Oct 26, 2009
- Review & assess previous application results – Nov. 02 – Nov. 20, 2009
- Review & assess previous geodatabase data and information – Nov. 09 – Nov. 25, 2009
- Review & assess defined equipment/software capability—Nov.16 – Dec.01, 2009
- Perform utility assessment of ArcExplorer or MapWindows

Software applied individual applications
-- Dec. 01, 2009 – Jan.01, 2010
- Complete User needs and requirements activity – Dec 01, 2009
- Perform Specific orientation training definition for use of selected software/equipment
  -- Dec 15, 2009 – Jan. 05, 2010
- Conduct GIS software/equipment installations – Jan. 04 – Jan 08 , 2010
- Conduct specific orientation training for equipment/software
  -- Jan. 12- Jan. 15, 2010
- Initiate the definition and development of specific user applications and queries
  -- Jan, 20, 2010
- Define and address of technical issues needing further investigation
  -- Jan 20 – April 02, 2010
- Perform specific application training definition for use with selected software/equipment
  -- Jan 21 – Feb. 10, 2010
- Conduct specific user application training -- Feb.16 – Mar 12, 2010
- Perform equipment/software testing & verification readiness
  -- Jan 10 – April 02, 2010
- Conduct application demonstrations using previously developed applications
  -- April 02 – April 30, 2010
- Perform assessment of application demonstration results and define modifications
  -- April 15 – May 14, 2010
- Complete the development of newly defined specific user applications and queries
  -- May 14, 2010
- Perform further specific user application training if needed.
  -- May 17 – June 03, 2010
- Perform application demonstration and evaluations of all original and new applications
  -- June 01 – July 30, 2010
- Perform specific cost benefit assessment for all application demonstration results
  June 14 – August 10, 2010
- Conduct final applications demonstrations to County management
  -- Aug 10 -- Aug. 20, 2010
- Conduct assessment of operational capability and develop capability recommendations
  July 15 – Aug. 13, 2010
- Conduct final assessment of Pilot Project and provide reporting – Aug. 01 – Sep. 03, 2010
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<td>-Demonstrations to County managers &amp; decision makers</td>
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-Document (each User)  
-All Users  
-Document  
-Each Mgr.
Task Activity Flow

1. Request Letter for Users → Selection of Users → Establish User Support
2. General Orientation Training Definition → Conduct Orientation Training For Users → Begin User Needs and Requirements Definition
3. Assess Previous Application Demonstrations → Assess Previous Geodatabase Data and Information & Define New Data → Assess Applications Types Used By others
4. Complete Definition of User Needs and Requirements → Assess ArcExplorer/MapWindows Applied to Requirements **
5. Finalize GIS Software and Equipment Used in Project → Define GIS Software/Equipment Orientation Training → GIS Software/Equipment Installation
6. Perform GIS Software/Equipment Training ** → Begin Development of Specific User Applications and Queries → Definition of User Specific Applications Training
7. Perform Specific Applications Training ** → Definition of Application Technical Issues ** → GIS System Test, Verification & Readiness
8. Perform Applications Demos Of Previous Developed Apps. → Assess Demonstration Results and Modify Application → Finalize Newly Defined Specific User Applications and Queries
9. Perform Further User Specific Applications Training ** → Conduct Demo & Evaluation of Both Original and New → Conduct Specific Cost/benefits For All Applications
10. Conduct and Present Demos & To County Managers → Operational Capability Assessment & Provide Recommendations → Pilot Project Assessment and Reporting

Note: Task May Require OSU Dept of Geography/OCGI Support **