

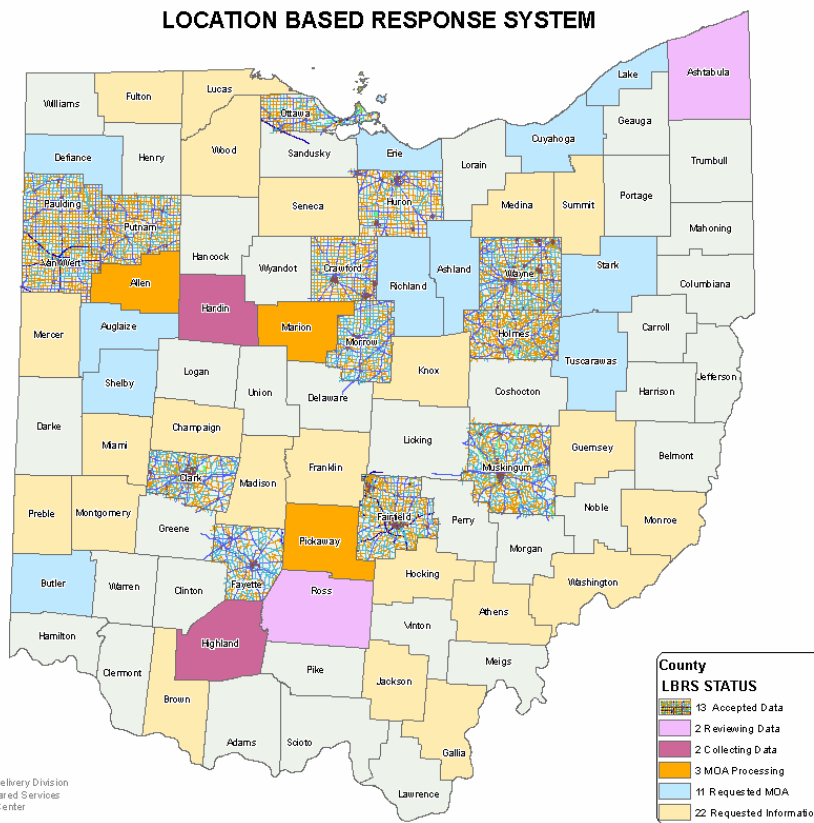
OHIO'S LOCATION BASED RESPONSE SYSTEM (LBRS)

The Ohio Location Based Response System (LBRS) is a component of the e-SecureOhio initiative that addresses the need for coordinated multi-jurisdictional spatial data creation and access between state and local government. Through collaborative efforts the LBRS program is producing highly accurate field verified data that is current, complete, consistent, and accessible.

The LBRS establishes partnerships between the Ohio Office of Information Technology's Ohio Geographically Referenced Information Program (OGRIP) and County government for the creation of spatially accurate street centerlines with address ranges and site-specific address locations. Once established, maintenance of the data is performed by the county using local knowledge and expertise to ensure accuracy and completeness of the data.

Participating counties provide project management, maintenance, and QA/QC to develop data that meets the LBRS data specifications established by the state. Data developed through this system support the needs of emergency responders at both the local and state level, provides digital mapping information required for 9-1-1 Phase II compliance, and enhances Enterprise Geocoding services at the state.

The Ohio Department of Transportation is the LBRS Program Sponsor, providing technical guidance, support, and QA/QC services to assure compatibility with ODOT's legacy data systems and integrate data into a unified transportation framework. OGRIP, the state's authorized Geographic Information System coordinating body administers the LBRS. As a program that is supportive of local government activities as well as state functions.



Examples of supported multi-jurisdictional activities are:

- Improved communications between state and local law enforcement and Emergency Management Agencies
- Improved crash analysis reporting and transportation studies resulting in additional federal funding;
- E-911 Emergency Response and Phase II compliance and reverse geocoding for cell phone calls;
- Improved collection and allocation of tax dollars through accurately locating addresses;
- Improved Census geography which equates to better services to the citizenry.

The LBRS is an Ohio asset built and maintained by local resources and used by all. This program is part of a coordinated long-term effort by OGRIP to reduce redundant data

collection by developing data that meets the needs of several levels of government.

The LBRS represents a new way of doing business, one that recognizes and acknowledges the value local government's contribution to spatial data development by providing funding for the creation of a truly collaborative approach to data sharing and the development of the systems required to maintain it.

Ohio's Location Based Response System (LBRS) supports a multi-jurisdictional approach to protecting the health, safety and welfare of our citizens.

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A. Description of the business problem and solution

Spatial data activities in the State of Ohio have increased tremendously over the last ten years at all levels of government. This increase in activity has resulted in duplication of efforts as various levels of government expend taxpayers' dollars to map the same geographic area for different purposes. The development of coordinated collaborative approaches to create, maintain and share spatial data through governmental partnerships would reduce redundant activities; create opportunities for cost sharing resulting in interoperable spatial data sets and cost savings for all levels of government.

To confirm and substantiate the advantages of collaboration the state performed a Spatial Data Management Cost Benefit Analysis in 2000. This study revealed opportunities for significant savings from, the 2 million dollars spent annually on spatial data discovery and dissemination within state agencies, to the millions dollars spent annually by local government on data development. The cost benefit analysis established that significant savings of taxpayer's dollars could be realized through establishing collaborative partnerships to create, maintain and share spatial data.

In Ohio, the need for the "best available" spatial data to support emergency response to natural and man-made events was clear. OGRIP was aware that local governments had a vested interest in spatial data suitable for their business functions and that this data was more accurate and current than comparable data being created and maintained by state and federal government entities. OGRIP recognized the need for a statewide coordinated collaborative approach that leveraged efforts at all levels of the government would need to be built upon partnerships.

Ohio's Location Based Response System (LBRS) was developed as a partnership between state and local government. Designed as a bottom-up solution to data creation and maintenance, the LBRS program developed statewide standards for roadway centerline and address points that serve as backbone for the development of GIS data. Participation in the LBRS requires county agencies collaborate to establish a GIS Management Team to guide the development of the county LBRS to help ensure a successful implementation. A Memorandum of Agreement establishes a cost sharing mechanism for counties that meet requirements and build LBRS compatible systems to receive state capital funds to support system development.

With the LBRS, the state has assumed the role of data facilitator to promote information exchange with all levels of government, academia, and the private sector. The development of statewide framework data layers increases interaction and collaboration by providing a common foundation on which to better share and use spatial data. Creating an explicit data sharing environment is making relevant information available in a timely manner. All responders would be using common spatial data in a disaster or emergency situation improving coordinated response, logistical preparations describing location or place consistently and communicating the big picture.

The Ohio legislature has approved \$3.25 million of the \$7.5 million of capital funds requested through the E-Secure Ohio initiative to develop LBRS compliant capabilities in Ohio's 88 counties, the remaining \$4.25 million in funding has been requested and we are optimistic about its approval. In 2004 the first major component of the LBRS consisting of transportation centerline and address information, was initiated. To date OGRIP has partnered with 20 counties to create LBRS compatible systems, 13 of these counties have completed LBRS development and have received \$942,986.00 in LBRS funding.

The State of Ohio's Office of Information Technology - LBRS is an initiative OGRIP has been pursuing for more than five years – a comprehensive spatial data development program for Ohio. The State recognizes the need to develop framework data layers to support the creation of enterprise-wide applications.

B. Significance to the improvement of the operation of government

The Ohio Location Based Response System (LBRS) constitutes an important part of the state's comprehensive GIS program. Location based systems rely on the accuracy and currency of the underlying basemap data. The LBRS provides a foundation for location based services at all levels of government, creating a mechanism for vertical

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integration between levels of government for analysis, maintenance and future collaboration, where each level of government can work in concert with the other with defined responsibilities.

The Ohio Department of Transportation (ODOT) is the sponsor agency of the LBRS program providing quality control and data integration services. The LBRS has allowed ODOT to expand the scope of their inventory from the State roadway system to include an inventory of municipal roads. While the initial focus of ODOT was on roadway inventory and improving the spatial accuracy of their existing data, the quality of the data developed has resulted in significant improvements to the department's ability to locate vehicle crashes both on and off the state system. This improved reporting ability provides ODOT with the data to support request for transportation safety dollars from the federal government. These funds support traffic safety improvements on the state system, and by identifying high hazard locations on local roads provide the justification for passing federal safety dollars to local government for roadway improvements on the local system.

Additional improvements are being realized through the automation of the annual roadway mileage certification process to include digital submission and certification of road miles by the county. The maintenance of the roadway inventory in digital format frees up both state and county resources, the adherence to the LBRS standards allows the state to link these data directly to the robust legacy databases developed by ODOT over the years.

Historically counties have had no coordinated effort to compile address databases or locations into a common enterprise solution. LBRS provides a mechanism for collaboration by requiring a cooperative effort between agencies to build, update, and maintain a single system of official roads and address locations. This allows county agencies the ability to reconcile existing address databases with a single official version and promotes data interoperability between local agencies.

As the LBRS program has developed, the U.S. Census Bureau has utilized LBRS data to assist with their ongoing efforts to update the accuracy of the roadway inventory and demographic boundary information used to canvas the state and obtain census data. -

Higher reliability and confidence in address location across the state - Enterprise geocoding services provided by the state are utilizing improvements to these data to improve the spatial accuracy of queries about "Where". Tax and School District determinations are made by geocoding, emergency responders rely heavily on geocoding and address matching that is made possible by improvements to the transportation basemap to ensure efficient routing of first responders.

GIServOhio Portal – consolidated storage costs... Accessible data supporting public and private activities - LBRS data is provided through Internet based map services that allow the public and government entities to consume services on their desktop, relieving the need to download, format, process, and store massive quantities of spatial data from various sources.

Better coordination between state and county government - The partnerships formed through the LBRS program between state and local government represent a paradigm shift in the way GIS activity is being perceived and how data sharing and collaboration is being accomplished. GIS is changing relationships between levels of government, State agencies that don't even know they are using GIS are benefiting from the improvements made to this basemap.

Strengthening communications and coordination at the county level- Disparate groups must communicate needs and requirements for a unified spatial data set supporting numerous applications at the local level- the establishment of GIS Management teams at the local level which result in better communication and cooperation with county government. This is serving to break down barriers that have existed between agencies for years and is serving to foster cooperative sharing of data and services. 911 and Emergency Responders now have a place at the table along with the traditional GIS users such as County Auditors and Engineers.

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C. Benefits realized by service recipients

While the initial creation of the LBRS relies on the road centerline network and addressing system to tie data from the state's counties together, the longer term view is that all framework elements will be exchanged between governmental groups on a regular basis. State groups, such as the Ohio State Highway Patrol (OSHP), the Department of Natural Resources (ODNR), and the Ohio Emergency Management Agency (OEMA) benefit from enhanced access to information about street centerlines and address locations through the state's Multi-Agency Radio Communications System (MARCS). The Ohio Department of Transportation (ODOT) is incorporating LBRS data into their existing Roadway Inventory to achieve better spatial accuracy and attribution for crash analysis and reporting. Additionally, ODOT is expected to create programs containing value-added information which could then be returned to the counties to enhance their GIS databases, as well.

Of the data consumers at the Federal level, the most significant users will include the US Geological Survey (USGS), the Census Bureau, and the Department of Homeland Security. The LBRS provides a common set of geographic information that will assist agencies in providing a coordinated response to events. The LBRS will help state agencies to report environmental and demographic information more effectively, since the data will be more current and more accurately reflect local conditions throughout the state.

At the local level counties agencies such as Sheriffs and 911 are realizing significant benefits through from reduced response times and improved capabilities for emergency responders. *"We can now accurately locate and track cellular calls. This move towards tracking cellular calls was a necessary step to improve the safety of our communities."* William Ommert, Huron County EMA Coordinator. LBRS compliant data is being used to improve Master Street Address Guides (MSAG), reconcile legacy address databases, and provide accurate and consistent transportation data to other county agencies to support routing, address matching, and location based services.

Access to LBRS data is provided through links to Web Map Services (WMS). These map services are compliant with the standards of the Open GIS Consortium (OGC) that are consumed by desktop GIS applications like ArcMap and GeoMedia. While the Location Based Response System is a construct of the state of Ohio, it nevertheless provides a bridge between its counties, regional data users, state agencies, and the federal government. The collaboration of public services demonstrated in this program will doubtless be an example for many.

D. Realized return on investment

While the LBRS is in its infancy as a program, government entities are beginning to realize significant returns both monetarily as well as in less tangible, but equally significant ways:

Clark County Ohio performed a traffic safety analysis to identify high-hazard intersections using LBRS data. As a result of the quality of the LBRS data the county was able to save \$70,000 on a \$100,000 project.

Putnam County, Ohio used the LBRS as the foundation for their voter information website to direct voters to the correct precinct and identifies pertinent ballot issues based on the voter's place of residence.

ODOT will eliminate site visits to the 88 counties for annual road mileage certification by incorporating LBRS data as the reporting mechanism by counties to the state. As the state realizes relief from the ongoing maintenance on the state's roadway system by the participation of the counties, resources freed up at the state level will be available to be passed down to the local level to support their ongoing maintenance needs.

Before LBRS, Van Wert County's 9-1-1 dispatch system was wrought with problems resulting in error rates of up to 85% on locating incidents by address. With the implementation of LBRS, this error rate has been reduced to roughly 15%.

Morrow County's 9-1-1 Coordinator stated, "Putting the enhanced mapping data [LBRS] into the county PSAP has already reduced response times..... There is no question that this information and enhanced capability will ultimately save lives."

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The Department of Census has begun using LBRS data to enhance their TIGER Modernization program. Data accepted into the program will eliminate the need for Census to recreate data that has already been developed at the local level, resulting in a substantial savings of federal taxpayer dollars.

The following four tables summarize representative programs and/or business functions that enhanced access to LBRS data will support.

Local Government	Vision Component
County GIS Programs	State counterparts can take on the job of disseminating data on demand; Creation of transportation data can serve as a catalyst toward enhancing GIS capabilities throughout county government
E-911 initiatives	Improved response capability, current off the shelf data has resulted in error rates of up to 80%; Use of LBRS data in adjacent counties will provide standardization where it may not exist
Public Safety	Normal updates (address, etc.) for adjacent jurisdictions will be available through the LBRS to enhance accident reporting and for improved planning
Emergency response and preparedness	Increased access to other data from around the state will increase planning efficiency and provide for better coordination between responding agencies
Local Health Districts	Will provide the ability to track and respond to outbreaks more
Government Accounting Standards Board (GASB) Efforts	Tracking assets by location will promote compliance
Megan's Law compliance	Current address availability will promote compliance by improving the spatial accuracy of address locations

Table 2-1 LBRS Vision and Local Government

Regional Agency Function	Vision Component
Transportation Planning	Enhanced planning capabilities will follow more timely data availability
Solid Waste Siting	By combining development patterns and demographics, waste sitings can be determined strictly by need and least environmental impact
Development Tracking	Better geographic information will yield more accurate inventories of development and provide for improved growth planning
Economic Development	More current demographics, development data, traffic and transportation data will lead to more appropriate commercial/industrial development
Census Reporting	Enhanced access to local government data will improve capabilities for demographic analysis

Table 2-2 LBRS Vision and Regional Government

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State Agency	Vision Component
Emergency Management Agency (EMA)	Better addresses, statewide result in improved planning and enhanced response capabilities
Ohio Administrative Knowledge System (OAKS)	Support asset management and property reporting through the state's Enterprise Resource Planning (ERP) system for OAKS
Multi-Agency Radio Communications System (MARCS)	Facilitate improved incident response
Ohio Security Task Force	Enhanced planning and response capabilities; Improved ability to track and manage assets spatially
Department of Transportation	Provide framework for interoperability of state legacy data; decreased maintenance responsibilities may be channeled toward local government to help with the ongoing maintenance and support of the system
Department of Natural Resources	Statewide consistency in coordinates and addresses will mean more accurate environmental assessment and tracking
Department of Job and Family Services	Child care and facility identification will be more accurate; Supports ongoing efforts to locate program participants
Department of Health	Support Disease Reporting (ODRS) and outbreak tracking; Facilitation of a coordinated response and planning for acts of bioterrorism; Improved ability to perform location-based epidemiological studies
Department of Taxation	More effective administration; aids Tax district determination
Department of Education	School district determination
Public Safety	Jurisdiction determination (ensuring appropriate distribution of funds)
Department of Agriculture	Identification of agricultural premises to support the federal Animal Identification Program; Location of hazardous materials and chemicals in rural areas (farm tanks –above ground)
Department of Commerce/Fire Marshall	Location of explosive materials, nuclear waste, underground tanks (inspection, relationship of materials to day care centers, nursing homes, etc.)

Table 2-3 LBRS Vision and State Agencies

Federal Government Programs	Vision Component
National Map	State becomes the "one stop shop" for national map data
National Spatial Data Infrastructure NSDI	Dissemination of standards can be built into routine updating
NIMA/USGS 133 Cities Initiative	Support for Ohio participants through GIServOhio
Homeland Infrastructure Feature Level Data (HIFLD)	Provide a conduit to DHS that saves staff time at both the county and federal level
Geospatial One Stop	GIServOhio supports the GeoSpatial One Stop model
TIGER Modernization	LBRS provides accurate maintained centerlines and address ranges
FEMA First Responders	Real time support anywhere in the state of Ohio

Table 2-4 LBRS Vision and Federal Government