



**INDIANA UNIVERSITY**  
OFFICE OF RESEARCH ADMINISTRATION

PROPOSAL

To

Indiana Office of Technology  
100 N. Senate Ave, IGCN Room N551  
Indianapolis, IN 46204

Attn: Jim Sparks, Executive Division

Title: "Indiana's Broadband map into the IndianaMap"

Period of Performance: January 1, 2010 – September 30, 2011

Original Date Submitted: December 22, 2009

Project Director Name and Mailing Address: Richard (Rick) Hill  
Indiana University, Indiana Geological Survey  
611 N. Walnut Grove Ave.  
Bloomington, IN 47405

Amount Requested: \$155,000.00

Applicant Institution:  
(Address for all Correspondence) Indiana University  
P.O. Box 1847  
Bloomington, IN 47402-1847  
(812) 855-0516 phone  
(812) 855-9943 fax  
[rugs@indiana.edu](mailto:rugs@indiana.edu)

Payment Address: Indiana University  
Office of Research Administration  
P.O. Box 66057  
Indianapolis, IN 46266-6057

Individual Authorized  
To Sign for the  
Institution:

Steven A. Martin  
Associate Vice President for Research Administration



**INDIANA GEOLOGICAL SURVEY**

611 N. Walnut Grove Ave., Bloomington, IN 47405-2208 · (812) 855-7636  
<http://igs.indiana.edu> · [IGSinfo@indiana.edu](mailto:IGSinfo@indiana.edu)

December 22, 2009

Jim Sparks  
100 North Senate Ave.  
IGCN Rm N551  
Indianapolis, IN 46204

Dear Jim Sparks:

Indiana University is pleased to submit its proposal for "*A Proposal to Integrate Indiana's Broadband Map into IndianaMap*" on behalf of Richard (Rick) Hill. This proposal is for inclusion in your grant application to the Indiana Geological Survey and has been administratively approved by the appropriate University officials. Support is requested for a 21 month period and is in the total amount of \$155,000.

If this proposal is successful, the University will ensure compliance with all pertinent federal regulations and policies. The subcontract agreement should be between your institution and the Trustees of Indiana University.

Administrative questions regarding the proposal should be directed to:

Grant Services  
Indiana University  
P.O. Box 1847  
Bloomington, IN 47402-1847  
(812) 855-0516 phone  
(812) 855-9943 fax  
email: [rugs@indiana.edu](mailto:rugs@indiana.edu)





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<http://igs.indiana.edu> · [IGSinfo@indiana.edu](mailto:IGSinfo@indiana.edu)

Questions regarding the technical aspects of this proposal should be directed to:

Richard (Rick) Hill  
611 North Walnut Grove Ave.  
Bloomington, IN 47405  
(812) 855-9583 phone  
[Hill2@indiana.edu](mailto:Hill2@indiana.edu) e-mail

Sincerely,

A handwritten signature in black ink that reads "Richard Hill".

**Project Director**  
Richard Hill  
Assistant Director, Indiana Geological Survey

**Authorizing official for the University:**  
Steven A. Martin  
Assoc. Vice President for Research Administration



*p:/statewide\_gis/documents/broadband\_extension\_2010/proposal\_broadband\_112309.doc*

**TO:** Jim Sparks, Indiana Geographic Information Officer  
**FROM:** Rick Hill, Indiana Geological Survey  
**DATE:** November 23, 2009  
**RE:** A Proposal to Integrate Indiana's Broadband Map into the IndianaMap

A national project is currently underway to map the distribution and availability of broadband internet services. A public-private partnership, in cooperation with Internet Service providers, is gathering and processing data to create a geographic information system (GIS) layer. While this mapping effort progresses, it will be necessary to make these data and their subsequent updates available to the public. As part of this effort, the Indiana Geological Survey proposes to perform the following tasks during the contractual period from January 1, 2010, through September 30, 2011:

- To review the broadband map data as they become available.
- To work with data providers to produce metadata that is compliant with standards of the Federal Geographic Data Committee (FGDC).
- To incorporate the broadband map data, together with their metadata, into the IndianaMap Atlas ( <http://inmap.indiana.edu/viewer.htm> ).
- To make the broadband map data available for downloading through the IndianaMap Atlas ( <http://inmap.indiana.edu/download.html> ).
- To review and process updates to the broadband map data and metadata, and to incorporate the updates into the IndianaMap Atlas and associated download page.
- To continue to maintain, support, and update the IndianaMap Atlas on a monthly basis. This will include updates to various GIS layers as they become available, together with their metadata and download files.
- To migrate the IndianaMap Atlas from ESRI ArcIMS technology to ESRI ArcGIS Server (AGS) technology.
- To develop, as necessary, specialized Web-based map viewers in addition to the IndianaMap Atlas.

**Integrate Indiana's Broadband Map into the IndianaMap  
State: Indiana**

AGENCY: Indiana Office of Technology				DATES: January 1, 2010- September 30, 2010			
Principal Investigator: R. Hill				Year 1			
ITEM	DESCRIPTION	RATE		UNIT	Agency	TOTAL	
<b>A</b>	<b>SALARY/WAGES</b>						
1	R. Hill	67,000	0%	0	10%	6,700	6,700
2	P. Rohwer	52,500	0%	0	50%	26,250	26,250
3	D. Harper	61,478	0%	0	29%	17,895	17,895
4	M. Daniels	51,000	0%	0	18%	9,180	9,180
5	K. Griffin	38,917	0%	0	23%	8,951	8,951
6	C. Dintaman	44,200	0%	0	42%	18,564	18,564
7							
8							
9							
10							
11							
12							
13				0		0	-
14				0		0	-
15				0		0	-
16	TOTAL			0		87,540	87,540
<b>B</b>	<b>FRINGE BENEFITS</b>						
1	R. Hill				34.72%	2,326	2,326
2	P. Rohwer			-	34.72%	9,114	9,114
3	D. Harper				34.72%	6,213	6,213
4	M. Daniels				34.72%	3,187	3,187
5	K. Griffin				35.46%	3,174	3,174
6	C. Dintaman				34.72%	6,445	6,445
7							
8							
9							
10							
11							
12							
13				-		-	-
14				-		-	-
15				-		-	-
16	TOTAL			-		30,460	30,460
<b>C</b>	<b>SUPPLIES &amp; EXPENSES</b>						
1	TeleAtlas					5,000	5,000
2	ESRI ArcGIS Server and ArcGIS Desktop					2,000	2,000
3	TOTAL			-		7,000	7,000
<b>D</b>	<b>TRAVEL</b>						
1		\$ 0.505	-	-	-	-	-
2			-	-		-	-
3			-	-		-	-
4			-	-		-	-
5	TOTAL		-	-		-	-
<b>E</b>	<b>EQUIPMENT</b>						
1				-		-	-
<b>F</b>	<b>OTHER</b>						
1			-			-	-
2						-	-
3			-			-	-
4			-			-	-
5	TOTAL		-			-	-
<b>G</b>	<b>DIRECT COST</b>					125,000	125,000
<b>H</b>	<b>INDIRECT COST</b>						
<b>I</b>	<b>TOTAL COSTS</b>			\$ -		\$ 125,000	\$ 125,000

**Integrate Indiana's Broadband Map into the IndianaMap  
State: Indiana**

AGENCY: Indiana Office of Technology				DATES: October 1, 2010- September 30, 2011			
Principal Investigator: R. Hill				Year 2			
ITEM	DESCRIPTION	RATE		UNIT	Agency	TOTAL	
<b>A</b>	<b>SALARY/WAGES</b>						
1	C. Dintaman	44,200	0%	0	50%	22,268	
2							
3							
4							
5							
6							
7							
8							
9							
10				0		0	
11				0		0	
12				0		0	
12	TOTAL			0		22,268	
<b>B</b>	<b>FRINGE BENEFITS</b>						
1	C. Dintaman				34.72%	7,732	
2							
3							
4							
5							
6							
7							
8							
9							
10				-		-	
11				-		-	
12				-		-	
13	TOTAL					7,732	
<b>C</b>	<b>SUPPLIES &amp; EXPENSES</b>						
1						-	
2						-	
3	TOTAL					-	
<b>D</b>	<b>TRAVEL</b>						
1		\$0.505	-	-	-	-	
2			-	-		-	
3			-	-		-	
4			-	-		-	
5	TOTAL					-	
<b>E</b>	<b>EQUIPMENT</b>						
1						-	
<b>F</b>	<b>OTHER</b>						
1			-			-	
2						-	
3			-			-	
4			-			-	
5	TOTAL					-	
<b>G</b>	<b>DIRECT COST</b>						
						30,000	
<b>H</b>	<b>INDIRECT COST</b>						
1						-	
<b>I</b>	<b>TOTAL COSTS</b>						
				\$ 1	\$ 30,000	\$ 30,000	

**Integrate Indiana's Broadband Map into the IndianaMap  
State: Indiana**

AGENCY: Indiana Office of Technology			DATES: January 1, 2010- September 30, 2011				
Principal Investigator: R. Hill			Cumulative				
ITEM	DESCRIPTION	RATE			UNIT	Agency	TOTAL
<b>A</b>	<b>SALARY/WAGES</b>						
1	R. Hill	67,000	0%	0		6,700	6,700
2	P. Rohwer	52,500	0%	0		26,250	26,250
3	D. Harper	61,478	0%	0		17,895	17,895
4	M. Daniels	51,000	0%	0		9,180	9,180
5	K. Griffin	38,917	0%	0		8,951	8,951
6	C. Dintaman	44,200	0%	0		40,832	40,832
7							
8							
9							
10							
11							
12							
13					0	0	-
14					0	0	-
15					0	0	-
16	TOTAL				0	109,808	109,808
<b>B</b>	<b>FRINGE BENEFITS</b>						
1	R. Hill					2,326	2,326
2	P. Rohwer				-	9,114	9,114
3	D. Harper					6,213	6,213
4	M. Daniels					3,187	3,187
5	K. Griffin					3,174	3,174
6	C. Dintaman					14,177	14,177
7							
8							
9							
10							
11							
12							
13					-	-	-
14					-	-	-
15					-	-	-
16	TOTAL				-	38,192	38,192
<b>C</b>	<b>SUPPLIES &amp; EXPENSES</b>						
1	TeleAtlas					5,000	5,000
2	ESRI ArcGIS Server and ArcGIS Desktop					2,000	2,000
3	TOTAL				-	7,000	7,000
<b>D</b>	<b>TRAVEL</b>						
1		\$ 0.505	-	-	-	-	-
2			-	-			-
3			-	-			-
4			-	-			-
5	TOTAL				-	-	-
<b>E</b>	<b>EQUIPMENT</b>						
1					-	-	-
<b>F</b>	<b>OTHER</b>						
1					-	-	-
2							-
3					-	-	-
4					-	-	-
5	TOTAL				-	-	-
<b>G</b>	<b>DIRECT COST</b>					155,000	155,000
<b>H</b>	<b>INDIRECT COST</b>						
1							
<b>I</b>	<b>TOTAL COSTS</b>				\$ -	\$ 155,000	\$ 155,000

# ***MSP Project Work Requirements Form***

Vendor Conference?	NA
Date Proposals Due	9/16/2009
Maximum Proposal Cost	
Latest Completion Date	

## **Vendor Response**

The vendor's response to this solicitation should include the following:

1. Describe the solution the vendor intends to use to satisfy the requirements established in the solicitation, including specific tasks the vendor proposes to perform to complete the outlined deliverables.
2. Describe the experience that the vendor has with this type of project.
3. Provide résumés of the staff that will work on this project, detailing their experience working on similar projects and fulfilling the requirements outlined within this document.
4. Provide up to three references that have used vendor for project work of this type in the recent past, referring to the requirements in the vendor profile section of this document.
5. Provide a project plan including the projected schedule or timeline for project.
6. Provide a description of the deliverables for this project.
7. Provide a fee schedule for each deliverable, and an hourly rate for each job description required to produce each deliverable.

Questions may be sent to Andrea Connell (andrea@knowledgeservices.com) before \_\_\_\_\_ on \_\_\_\_\_.

Proposals for this opportunity are to be emailed by \_\_\_\_\_, ET, on \_\_\_\_\_, to Andrea Connell (andrea@knowledgeservices.com).



# ***MSP Project Work Requirements Form***

***MSP Project Opportunity:*** Mapping Broadband for Indiana – Spatial Data Processing

## ***Purpose***

To provide support to a statewide project to map broadband availability by processing a variety of spatial data types, including address points, land parcels, service territory maps and other data using ESRI ArcGIS software tools.

## ***Background***

Broadband is an essential component of e-commerce and economic development. According to high-tech market research firm IN-Stat, “By 2011, total worldwide broadband subscribers will number 567 million, almost double the current [2007] 285 million subscriber base.” Even with such a high rate of adoption, however, not all areas in Indiana or in the nation have access to high speed broadband. For these reasons, the National Telecommunications and Information Administration (NTIA) issued a Notice of Funds Availability (NOFA) on July 1, 2009 for the State Broadband Data and Development Program. Through this NOFA, the NTIA expects to grant \$240 million to states for the development and maintenance of state broadband mapping.

The timelines outlined in the NOFA are ambitious:

- Grant applications must be submitted by August 14, 2009.
- The first set of mapping data should be collected by November 1, 2009, and the
- Broadband mapping projects should be substantially completed before February 1, 2010.

Meeting these tight delivery dates will be challenging, and will require 1) a high level of cooperation among project partners, 2) rich “in-hand” data of a type and accuracy to satisfy the NOFA requirements, 3) a practical plan to acquire data that is not immediately available, and 4) a dependable and repeatable process to create and maintain the broadband maps. Fortunately, these critical elements are in place in Indiana to create maps to serve as the planning foundation for justifying broadband expansion projects. These maps must be high-quality and ultimately depict broadband availability, technology, speed, and infrastructure.

## ***Services Required***

- FME trouble shooting and data harvesting from Indiana County Web Feature Services
- Transferring attributes from one geography to another
- Scanning and digitizing hardcopy spatial data items such as service territory maps
- Processing data from:
  - The Indiana Utility Regulatory Commission (broadband data)

# ***MSP Project Work Requirements Form***

- Office of Utility Consumer Counselor (broadband data)
- The Indiana Business Research Center (demographic data)
- Indiana Department of Local Government Finance (residential versus commercial status by address)
- Indiana Counties (point addresses, land parcels, road centerlines with address ranges, and administrative boundaries, aggregated and integrated into the IndianaMap)
- Indiana Department of Natural Resources (State forests and parks)
- Indiana Department of Homeland Security (locations of emergency medical service (EMS) stations, fire stations, and hospitals),
- Department of Education (school locations),
- Indiana Libraries (point of connectivity for low income/unemployed consumers— provide vital speed information for respective geographical locations)
- Commission for Higher Education (locations of colleges and universities), and others.
- These data will be processed using ESRI ArcGIS tools.
- For purposes of estimation, assume between 8 and 12 broadband service providers per county.

## ***Deliverables Required***

1. ESRI shapefiles or Geodatabases of land parcels, point addresses, local road centerlines, and local boundaries of approximately 40 counties.
2. ESRI shapefiles or Geodatabases of broadband service data, demographics, locations of anchor institutions (schools, hospitals, libraries, fire stations, etc)
3. Flat files and ESRI shapefiles as defined in the TECHNICAL APPENDIX STATE BROADBAND DATA AND DEVELOPMENT GRANT PROGRAM at <http://www.ntia.doc.gov/broadbandgrants/StateBroadbandMapping.pdf> and as further defined and clarified by any documents that have been or will be posted by NTIA at [www.ntia.doc.gov](http://www.ntia.doc.gov) , including RIN 0660-ZA29.

## ***Selection Criteria***

<b>Criteria</b>	<b>Points (Percentage)</b>
Cost	30
Approach	30
Quality of Staff	20
Experience with broadband data Experience with ESRI tools	20
<b>Total</b>	<b>100</b>

**39° N**™

**GIS. Anywhere. Anytime.**

*39 Degrees North -  
MSP Project Work  
Requirements Form*

September 16

2009

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To provide support to a statewide project to map broadband availability by processing a variety of spatial data types, including address points, land parcels, service territory maps and other data using ESRI ArcGIS software tools.

Mapping  
Broadband for  
Indiana -  
Spatial Data  
Processing

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## A. Information Downloaded from DotStaff

**MSP Project Opportunity:** Mapping Broadband for Indiana – Spatial Data Processing

<b><i>Purpose</i></b>
To provide support to a statewide project to map broadband availability by processing a variety of spatial data types, including address points, land parcels, service territory maps and other data using ESRI ArcGIS software tools.

<b><i>Background</i></b>
<p>Broadband is an essential component of e-commerce and economic development. According to high-tech market research firm IN-Stat, “By 2011, total worldwide broadband subscribers will number 567 million, almost double the current [2007] 285 million subscriber base.” Even with such a high rate of adoption, however, not all areas in Indiana or in the nation have access to high speed broadband. For these reasons, the National Telecommunications and Information Administration (NTIA) issued a Notice of Funds Availability (NOFA) on July 1, 2009 for the State Broadband Data and Development Program. Through this NOFA, the NTIA expects to grant \$240 million to states for the development and maintenance of state broadband mapping.</p> <p>The timelines outlined in the NOFA are ambitious:</p> <ul style="list-style-type: none"> <li>• Grant applications must be submitted by August 14, 2009.</li> <li>• The first set of mapping data should be collected by November 1, 2009, and the</li> <li>• Broadband mapping projects should be substantially completed before February 1, 2010.</li> </ul> <p>Meeting these tight delivery dates will be challenging, and will require 1) a high level of cooperation among project partners, 2) rich “in-hand” data of a type and accuracy to satisfy the NOFA requirements, 3) a practical plan to acquire data that is not immediately available, and 4) a dependable and repeatable process to create and maintain the broadband maps. Fortunately, these critical elements are in place in Indiana to create maps to serve as the planning foundation for justifying broadband expansion projects. These maps must be high-quality and ultimately depict broadband availability, technology, speed, and infrastructure.</p>

<b><i>Services Required</i></b>
<ul style="list-style-type: none"> <li>• FME trouble shooting and data harvesting from Indiana County Web Feature Services</li> <li>• Transferring attributes from one geography to another</li> </ul>

- Scanning and digitizing hardcopy spatial data items such as service territory maps
- Processing data from:
  - The Indiana Utility Regulatory Commission (broadband data)
  - Office of Utility Consumer Counselor (broadband data)
  - The Indiana Business Research Center (demographic data)
  - Indiana Department of Local Government Finance (residential versus commercial status by address)
  - Indiana Counties (point addresses, land parcels, road centerlines with address ranges, and administrative boundaries, aggregated and integrated into the IndianaMap)
  - Indiana Department of Natural Resources (State forests and parks)
  - Indiana Department of Homeland Security (locations of emergency medical service (EMS) stations, fire stations, and hospitals),
  - Department of Education (school locations),
  - Indiana Libraries (point of connectivity for low income/unemployed consumers— provide vital speed information for respective geographical locations)
  - Commission for Higher Education (locations of colleges and universities), and others.
- These data will be processed using ESRI ArcGIS tools.
- For purposes of estimation, assume between 8 and 12 broadband service providers per county.

#### ***Deliverables Required***

1. ESRI shapefiles or Geodatabases of land parcels, point addresses, local road centerlines, and local boundaries of approximately 40 counties.
2. ESRI shapefiles or Geodatabases of broadband service data, demographics, locations of anchor institutions (schools, hospitals, libraries, fire stations, etc)
3. Flat files and ESRI shapefiles as defined in the TECHNICAL APPENDIX STATE BROADBAND DATA AND DEVELOPMENT GRANT PROGRAM at <http://www.ntia.doc.gov/broadbandgrants/StateBroadbandMapping.pdf> and as further defined and clarified by any documents that have been or will be posted by NTIA at [www.ntia.doc.gov](http://www.ntia.doc.gov) , including RIN 0660-ZA29.

#### ***Selection Criteria***

<b>Criteria</b>	<b>Points (Percentage)</b>
Cost	30
Approach	30
Quality of Staff	20

Experience with broadband data	20
Experience with ESRI tools	
<b>Total</b>	<b>100</b>

Vendor Conference?	NA
Date Proposals Due	9/16/2009
Maximum Proposal Cost	
Latest Completion Date	

### Vendor Response

The vendor's response to this solicitation should include the following:

1. Describe the solution the vendor intends to use to satisfy the requirements established in the solicitation, including specific tasks the vendor proposes to perform to complete the outlined deliverables.
2. Describe the experience that the vendor has with this type of project.
3. Provide résumés of the staff that will work on this project, detailing their experience working on similar projects and fulfilling the requirements outlined within this document.
4. Provide up to three references that have used vendor for project work of this type in the recent past, referring to the requirements in the vendor profile section of this document.
5. Provide a project plan including the projected schedule or timeline for project.
6. Provide a description of the deliverables for this project.
7. Provide a fee schedule for each deliverable, and an hourly rate for each job description required to produce each deliverable.

## 1. Description of Solution

*Describe the solution the vendor intends to use to satisfy the requirements established in the solicitation, including specific tasks the vendor proposes to perform to complete the outlined deliverables.*

39°N will use ESRI ArcGIS tools to geoprocess the data associated to this project and will also be used to create a geodatabase (GDB\_1) to contain the following datasets: land parcels, point addresses, local road centerlines, and local boundaries of approximately 40 counties. A separate geodatabase (GDB\_2) will include broadband service data, demographics, and locations of anchor institutions (schools, hospitals, libraries, fire stations, and other applicable data from the IndianaMap).

GDB\_1 will contain a single layer for each dataset (land parcels, point addresses, etc.) that will be harvested from the WFS feeds. It is understood that FME troubleshooting will be required in order to process this data. Since it is unknown at this point the level of troubleshooting, it would be a fair assumption that up to 120 hours may be needed to resolve data harvesting based on the nature of the work. 39°N will meet with the State's project manager to determine the proper coordinate system to be used for these layers. 39°N recommends using the same projection and coordinate system that is used on the IndianaMap (UTM Zone 16). Since much of the data required by this project exists on the IndianaMap and will have statewide coverage, using the same coordinate system will make updates manageable and will have an aesthetically pleasing look. The following geoprocessing tasks will be needed to create the layers contained in GDB\_1:

- 1) FME Troubleshooting
- 2) Re-projection of data
- 3) Geodatabase loading

The creation of GDB\_2 will rely on data downloaded from the IndianaMap and from the following providers: The Indiana Utility Regulatory Commission, Office of Utility Consumer Counselor, Indiana Business Research Center, Indiana Department of Local Government Finance, Indiana Department of Natural Resources, Indiana Department of Homeland Security, Department of Education, Indiana Libraries, and the Commission for Higher Education. Data from the IndianaMap is downloadable in shapefile format that can be loaded into a GDB\_2. Since it is unknown at this point what format the data will be provided by the other contributors, it is safe to assume that the following geoprocessing tasks will be needed:

- 1) Georeferencing and Vectorization of scanned maps
- 2) Attribution of vectorized maps
- 3) Transferring of attribute information (such as linking Internet Service Provider bill information to address points)
- 4) Re-projection of data to the desired coordinate system for this project
- 5) Creation of metadata to document the processes used to create the layers
- 6) Data parsing



39°N will work closely with the State’s project manager at the beginning of the project to discuss where the data to fulfill the Technical Appendix State Broadband Data and Development Grant Program requirements will be obtained. The availability by service address data will likely need to be parsed to relate to addresses from the WFS address point feeds. Even with parsed data, it is also likely that there will be mismatches between the datasets (just like georeferencing addresses). 39°N will provide a report of all addresses that fall below a certain level of confidence percentage. 39°N will also establish protocols to update and maintain the data defined in the Technical Appendix.

39°N will provide a secure internet site while working on this project so that everyone involved will be able to see the progress being made with the data on a daily basis. With this website, individuals will have the ability to review the work that has been completed and make requests for revisions. With the markup toolset, individuals can insert text (and) draw points, lines or polygons to show where changes need to be made and then send them directly to 39°N for revisions. If 39°N has questions about an area, they can also send the markups back to the individual asking for verification.

## 2. Experience

*Describe the experience that the vendor has with this type of project.*

39°N will rely heavily on its previous experiences in creating Atlases for GIS and developing mesh network planning software using ESRI ArcEngine software. All three of 39°N’s Co-founders played an integral part of the initial creation and on-going evolution of the “A GIS for Southwestern Indiana” to the “IndianaMap.” The work was funded by a grant from the Indiana Department of Transportation to compile more than 170 layers of geographic information that can be used to construct unique maps for specific uses. The GIS was compiled from a variety of sources, including federal and state agencies as well as Indiana Geological Survey files and records, for the 26 counties of the southwestern part of the state.

“A GIS for Southwestern Indiana” was such a success for INDOT that additional funding was provided to expand the project statewide. During this phase, the name was changed to “The GIS Atlas for Indiana.” The project’s main goals were to add additional map layers, update existing layers, and add functionality to the ESRI ArcIMS-based web viewer. More than 80 additional layers were added once again from various sources and hardcopy maps. About 6 years after the initial creation of a digital atlas of geographic information for Indiana, the project gained stronger alliances with the Indiana Geographic Information Council and the project is now known as the “IndianaMap.”

During all three phases, many skills homogenizing data were acquired that relate to this broadband mapping project.

- 1) Processing spatial data from multiple sources
- 2) Georeferencing and vectorizing scanned maps
- 3) Re-projecting data into a single coordinate system
- 4) Establishing consistent naming conventions
- 5) Developing spatial databases
- 6) Creating metadata to aid in future updates

In addition to the 39°N Co-founders experience in creating enterprise GIS applications for Indiana, the 39°N Team has much experience with creating county-wide GIS atlases for local county governments. Although similar to the workflows of creating and maintaining the IndianaMap, GIS applications for local government require linking voluminous amounts of non-spatial and spatial data for local county government. Using custom scripting, 39°N transfers information from assessment and tax databases to GIS layers such as land parcels. In this project, it was mentioned that transferring attributes from one geography to another will be desired. 39°N has a proven track record with Clark, Grant, Martin, Miami, Monroe and Morgan Counties in updating land parcels by transferring attributes from CAMA and Tax databases to the GIS.

39°N also has experience in developing GIS applications to assist with optimizing wireless signals to optimize coverage over geographic areas. 39°N and Next Wave Systems worked together to design a wireless mesh network for Y-12. The Y-12 National Security Complex is a premier manufacturing facility dedicated to making our nation and the world a safer place. Operated by B&W Y-12 for the National Nuclear Security Administration, Y-12 plays a vital role in the Department of Energy's Nuclear Security Enterprise.

39°N also has experience in working with Safe Software's FME development team in troubleshooting Web Feature Services (WFS) feeds from various sources. During this support for the Indiana Department of Homeland Security (IDHS), 39°N donated support to assist the IDHS grant during the pilot project phase. This history will allow 39°N to assist the State with FME trouble shooting and data harvesting of Indiana County WFS feeds. In the near future, 39°N will have six Indiana clients contributing data to the state through the IDHS grant.

Lastly, Rapid Aerostat Initial Deployment (RAID) is a U.S. Army-sponsored tactical surveillance system for its Base Defense Operation Centers (BDOC). The RAID system consists of one or more laptops, a tower or aerostat, a suite of multi-spectral sensors, and a Ground Control Station (GCS) with related defense and communications equipment. RAID provides base security cells with nearly 360 degrees of high-resolution, day/night surveillance capability, enhancing target recognition and situational awareness and enabling timely and appropriate responses. Personnel at the GCS control, track, and operate the aerostat, manipulate sensor components

including electro-optical infrared cameras, receive and process laser telemetry and video downlinks, and call for direct air attacks, adjustable indirect fire, or ground patrols.

39°N is developing RAID's map interface using ArcGIS Engine, which allows quick customizations of map panels and ready access to enormous libraries of geospatial information, including the Military Grid Reference System, Joint Operations Graphics, and Tactical Line Maps integrated into three-dimensional terrain analysis. This application is being developed using Java and is also capable of creating Radial Line of Sight (RLOS) on-the-fly by using Digital Terrain Elevation Data (DTED).

### 3. Résumés

*Provide résumés of the staff that will work on this project, detailing their experience working on similar projects and fulfilling the requirements outlined within this document.*

*a) Organization Description:*

39°N is comprised of an all-star team of the best-of-the-best. We have secured some of the top website and application developers in the industry. Our team of developers is a melting pot of individuals having unique skill sets to make the perfect team. By having a diverse group of developers, we are able to offer our clients several options for creating applications that will best suit the clients' needs. 39°N also has a team of interaction designers on staff to offer our clients the unique experience of visualizing the product before it is developed using state-of-the-art software.

While 39°N's project manager is the main point of contact for any given project, it is not unusual for our clients to receive personal visits and phone calls from one or more of the owners. Our structure is unique because our project manager, developers and interaction designers all report directly to the owners of the 39°N instead of to a department head or Vice President. Our project manager will coordinate all aspects of the project to ensure that specifications are met and that all quality controls and assurances have been performed.

We would like to emphasize that our development team, interaction designers, and project manager all work together with the owners to ensure that the needs of our clients are being met and exceeded.

*b) List of Key Project Participants:*

Arnon Tsairi  
Chris Walls  
Denise Stuckey  
Prem Radhakrishnan

Our Team may expand to meet the deliverable timelines. In this case, these individuals resumes will be submitted for approval.

**Arnon Tsairi**  
**GIS Analyst**

Arnon has over a decade of GIS and databases. Arnon has experience with analyzing data, creating data, and manipulating an array of different databases to attribute GIS data. Along with creating and manipulating data, Arnon has also worked with ArcPad application development and ArcIMS website maintenance. Arnon has also played a key role in setting up the WFS links for the IDHS to access our client's data.

**Education:**

2000 BS in Biology with honors from Ben Gurion University of Negev

**Project Experience as a GIS Analyst:**

- **Monroe County, IN:**
  - Used geocoding process to map subscribers to the local library
  
- **Miami County IN:**
  - Geocoded addresses in the Peru city incorporated area so that the 911 data could be updated and the Area Planning department could visually see the address points.
  - Updated and digitized cadastral data layers to keep the eGIS website up to date.
  
- **Grant County, IN:**
  - Created a bridge point data layer from a database provided by Grant County Highway department. Assigned attributes from the database to the bridge point layer
  - Updated zoning layer based on changes requested by the Area Plan department.
  
- **Dearborn County, IN:**
  - Built a composite address locator for the Dearborn septic management system.
  - Tested the application on handheld tablets.
  
- **Clark County, IN:**
  - Data Analysis of registered voter information
  - Creation of voter precinct boundaries
  
- **Martin County, IN:**
  - Manipulated existing GIS data layer to create GIS ESRI data layers
  - Created a website with data from existing county GIS data, USGS data and data from the IndianaMap

**Chris Walls**  
**Senior GIS Consultant**

Chris has over a decade of professional GIS experience. He specializes in the development of GIS desktop and internet mapping applications along with database design. Chris has experience designing and implementing website applications in ArcIMS and ArcGIS server. Along with his superior skills in consulting, Chris also has an extensive technological background which enables him to develop the best solution that will fit the client's needs and exceed the client's expectations.

**Project Awards:**

2005 ESRI Special Achievement Award for Indiana Geologic Survey enterprise GIS and ArcIMS website

2006 ESRI Special Achievement Award for Monroe County, IN enterprise-wide GIS and ArcIMS website

**Education:**

Received a BA in Geography specializing in programming, GIS and remote sensing from Indiana University in 2000.

**Project Experience as a Programmer and Senior GIS Consultant:**

- **Monroe County , IN:**
  - Consulted with the client and implemented a countywide enterprise GIS and ArcIMS website.
  - Migrated county data from various shapefiles and autocad to an enterprise ArcSDE database, SQL Server setup and management, custom programming to synchronize GIS and CAMA data, and part of the team for developing the highly customized ArcIMS website integrating both GIS and CAMA data.
- **Indiana Geological Survey:**
  - Implemented and deployed a statewide enterprise GIS and ArcIMS website.
  - Migrated statewide data from various shapefiles to an enterprise ArcSDE database
  - Established naming conventions and created FGDC-compliant metadata.
- **Monroe County Health Services:**
  - Developed a customized ArcPad solution for inspection of septic sites, developed database and web application for permit application, created a custom ArcGIS check-in functionality for data collected in the field
- **Morgan County, IN:**
  - Implemented a county-wide enterprise GIS and an ArcIMS website for the county
  - Migrated county data from various shapefiles and Autocad to an enterprise GIS database.
- **Next Wave Systems:**
  - Implemented JAVA application to manage camera and sensor information with Next Wave Systems, LLC.
  - Designed and deployed a wireless mesh network for Y12.
- **University of Kentucky:**
  - In the process of designing and deploying a web-based facilities management application for a new \$1 Billion hospital.

***Denise L. Stuckey***  
***Project Manager***

Denise has over a decade of GIS experience specializing in government GIS data and applications. Denise's areas of expertise are developing data from an array of source maps, analyzing GIS data layers to find similarities and differences between different data sets, and organizing data into logical datasets. As a project manager, Denise places a strong emphasis on communication.

**Education:**

1995 dual BS from Ball State University in Psychology and Health Science

2001 GIS certificate from IUPUI

ArcMap Level I and II certified

**Related Project Experience:**

- 2001 DPW Impervious Surface Project – fast paced project which involved digitizing impervious surface in all nonresidential parcels in Marion County, IN. Once data was digitized then analysis was performed to determine the amount of money DPW could expect to receive from the additional utility bill.
  - Denise was the production manager for this fast paced project.
  - Oversaw the daily work of 12 technicians
  - Created data herself with heads up digitizing
  - In charge of communications with the Polis center and uploading the data onto a web based program called Project Desktop so Polis could QC the data.
  - Participated in meetings involving people from six organizations.
  
- 2005 Project Zoom (Honda Project in Decatur County IN) – nicknamed Project Zoom, this fast paced, confidential project incorporated GIS data and CAD data from different sources to determine whether a piece of property in Decatur IN was ideal for the new Honda plant.
  - Incorporated data from different sources to create maps and layouts for both presentations and survey plots for verification.
  - Worked with the Survey Department to help answer questions regarding miles to the nearest highway, rail system and flood information among other questions to help the officials of Honda decide on the best location.
  
- Managed and created data for several phase 2 911 projects which incorporated information regarding the cell towers.
  - Located cell towers on the orthophotography
  - Analysis of cell tower information to determine the amount of coverage each cell tower and provider had and in which directions.

**Prem Radhakrishnan**  
**Sr. Developer & Database Administrator**

Prem has over six years of experience with GIS and databases. He specializes in the development of databases, database driven web applications, GIS desktop and internet mapping applications. His Technology skills include programming in SQL, ColdFusion, Flex, Flash, ActionScript, ASP.NET, VB.NET, C#, Visual Basic, ArcObjects, Avenue, Fortran, JavaScript, HTML, UML design with Visio, Mach-II framework for ColdFusion, Cairngorm framework for Flex. Prem also has ESRI product knowledge which includes ArcGIS desktop applications, ArcGIS Server, ArcGIS Engine, ArcSDE, ArcIMS. Prem has been a programmer and database administrator on over 25 unique projects.

**Education:**

1994 BS in Mining Engineering from Banaras Hindu University

2003 MS in Geography specializing in GIS, Remote Sensing, and hydrogeology from Southern Illinois University

**Project Experience as a Senior Database Administrator:**

- **39°N eGIS Core Website Interface**
  - Developed core website in ArcIMS and deployed in Monroe County, IN
  - Later upgraded core website using Flex
  
- **University of Kentucky**
  - Designed a database security system to fit the client's specifications
  - In the process of writing the program for the facilities management application using Flex
  
- **Grant County, IN:**
  - Wrote the code using Flex technology for the Assessor's, Auditor's, EMA and Planning Suites.
  
- **Dearborn County, IN:**
  - Wrote the mobile application for collecting septic systems locations.
  - Mobile system works with ArcGIS server so that county officials can do real time updates of the data while out in the field.
  
- **Monroe County Health Services:**
  - Developed a customized ArcPad solution for inspection of septic sites, developed database and web application for permit application, (and) created a custom ArcGIS check-in functionality for data collected in the field.
  
- **FME / WFS Pilot Study for the Indiana Department of Homeland Security:**
  - Troubleshooting with the Safe Software FME Development Team.
  - Analyzed code, schemas, and field headers for live WFS feeds.
  
- **Next Wave Systems:**
  - Implemented JAVA application to manage camera and sensor information with Next Wave Systems, LLC.



#### 4. Client References

*Provide up to three references that have used vendor for project work of this type in the recent past, referring to the requirements in the vendor profile section of this document.*

**Robert Mullen**

Senior Computer Scientist  
Next Wave Systems, LLC  
501 N. Morton St. Suite 112  
Bloomington, IN 47404  
[robert.mullen@nextwavesys.com](mailto:robert.mullen@nextwavesys.com)  
Phone: 812-276-3159  
Services: GIS Deployment and Wireless Mesh Network design

**John Powell**

Information Technology Director  
Miami County, Indiana Government  
25 N Broadway  
Peru, IN 46970  
[jpowell@miamicountyin.gov](mailto:jpowell@miamicountyin.gov)  
Phone: 765-469-3900  
Services: GIS Development and Deployment and Attribute transfers from CAMA and tax databases

**Vicky Kent Haire**

Clark County, Indiana Assessor  
501 E Court Ave., Room 111  
Jeffersonville, IN 47130  
[vhaire@co.clark.in.us](mailto:vhaire@co.clark.in.us)  
Phone: 812-285-6228  
Services: GIS Development and Deployment and Data Creation

**5. Project**

*Provide a project plan including the projected schedule or timeline for project.*

Please note that these timelines are dependent on approval from the State's project manager. These will be agreed upon during the Kickoff Meeting.

**Today (Wednesday, 16 September)**

Bid Submission Due

**Wednesday, 23 September (7 days away)**

Project Kickoff Meeting (Identify and define process for collecting relevant broadband data "in-hand")

**Thursday, 24 September (8 days away)**

Begin FME/WFS Troubleshooting and Hard Copy Data Gathering

**Monday, 28 September (12 days away)**

Project Deliverables Document Submission for Signoff

**Monday, 28 September (12 days away)**

Begin Scanning and Georeferencing Hard Copy Maps

**Wednesday, 30 September (14 days away)**

Deliverable Signoff Due by State's Project Manager

**Thursday, 1 October (15 days away)**

Begin Vectorizing and Attributing Georeferenced Scanned Maps

**Friday, 2 October (16 days away)**

Begin Geoprocessing of IndianaMap Data

**Friday, 16 October (30 days away)**

Begin Geoprocessing WFS data

**Monday, 19 October (33 days away)**

Begin Transferring Attributes of the Source Data to Specific Addresses

**Monday, 26 October (40 days away)**

Begin QA/QC of Nov. 1 Data Delivery

**Sunday, 1 November (46 days away)**

Deliver First Set of Mapping Data

**Monday, 2 November (47 days away)**

Begin Further Refining Data Based from QA/QC Recommendations

**Wednesday, 13 January, 2010 (119 days away)**

Submit Substantially Completed Data for Review

**Thursday, 21 January, 2010 (127 days away)**

Incorporate Revisions from Review

**Monday, 1 February, 2010 (138 days away)**

Deliver Final Data for Phase 1

## 6. Deliverables

*Provide a description of the deliverables for this project.*

- 1) ESRI Geodatabase Containing: Land Parcels, Point Addresses, Local Road Centerlines (with address ranges), and Local Boundaries for Approximately 40 Counties:
  - a. Description: This deliverable will require mining data from one source and homogenizing it into a single layer of information for each of the desired datasets.
    - i. Will require FME / WFS troubleshooting and data harvesting from Indiana County Web Feature Services.
    - ii. Will require reprojecting the data into a common projection system.
    - iii. Will require data to be loaded into a geodatabase.
  
- 2) ESRI Geodatabase Containing: Broadband Service Data, Demographics, Locations of Anchor Institutions (Schools, Hospitals, Libraries, Fire Stations, etc.)
  - a. Description: This deliverable will require many agencies to submit their data in either digital or hardcopy format. These data will be processed to align properly with one another and metadata will be created.
    - i. Will require transferring attributes from one geography to another.
    - ii. Will require geoprocessing of data from various agencies.
    - iii. Will likely require scanning, digitizing, and attributing hardcopy spatial data such as service territory maps.
    - iv. Will require data to be loaded into a geodatabase.
  
- 3) Flat Files and ESRI Shapefiles as Defined in the Technical Appendix State Broadband Data and Development Grant Program
  - a. Description: This deliverable will require the State and 39°N to obtain and process sensitive information (such as broadband billing details) from appropriate agencies. This portion of the project will be dependent on many people and tight timelines. Communication and cooperation will be a critical component of this deliverable.
    - i. Will require transferring attributes from one geography to another.
    - ii. Will require geoprocessing of data from various agencies.
    - iii. Will require data to be submitted in the format specified in the Technical Appendix State Broadband Data and Development Grant Program

**7. Fee Schedule**

*Provide a fee schedule for each deliverable, and an hourly rate for each job description required to produce each deliverable.*

***Fee Schedule:***

<u>Deliverable</u>	<u>Percent of Contract</u>
Project Management	10-15%
GDB_1 - Up to 120 Hours of FME / WFS Troubleshooting	12-25%
GDB_2	25-35%
Flat Files and ESRI Shapefiles as Defined in the Technical Appendix State Broadband Data and Development Grant Program	25-35%
QA/QC	10-15%

***Job Descriptions:***

<u>JOB CLASSIFICATION</u>	<u>TASKS PERFORMED</u>	<u>MAX. HOURLY RATE</u>
GIS Project Manager	Overall Management	\$150.00
GIS Sr. Developer	Custom Scripting WFS Troubleshooting	\$100.00
GIS Developer	Support for Sr. Developer	\$80.00
GIS Analyst	Advanced Geoprocessing, Layer Management, and GeoDatabase Design	\$60.00
GIS Technician	Georeferencing Scanned Maps, Vectorization, and Attribution	\$45.00
Database Sr. Developer	Data Parsing and Database Creation	\$100.00
Database Developer	Support for Sr. Database Developer	\$80.00