GICC Data Sharing Draft 4.4
ATTACHMENT D
Business Case Summaries

July 22, 2007

Case #1: Road Centerline Data Distribution Center

The Statewide Mapping Advisory Committee's (SMAC) Working Group for Roads and Transportation (WGRT), a group comprised of representatives from NCDOT, MPOs, RPOs, COGs, and local governments, recently received an National Highway Safety Grant to develop a web based spatial data distribution site that will enable the sharing of local and state road data among local, regional, state, and federal government agencies. The Centerline Data Distribution Center (CDDC), which is being developed by CGIA in conjunction with the WGRT, will be restricted to registered users and limited to representatives from government agencies (the data will not be accessible to private entities or the public). It is anticipated that once the CDDC is active and a significant portion of eligible users of GIS road data are participating, the amount of staff time spent on acquiring and distributing road data will be greatly reduced. It has been estimated that the CDDC will save local, regional, state and federal governments $130,000 annually in staff time (see Table 1 and 2).

The benefits of this are two fold:

1. Governments that need local GIS road data will be able to go to a single site and download the latest datasets.

2. Local governments can direct governmental users of their data to the CDDC and reduce the amount of time that they spend fulfilling data requests.

Note that the cost savings are only achieved if local governments are willing to share their data without cost to other public non-commercial agencies.

WGRT CDDC Local Road Data Sharing Initiative

Summary: Based on staff time estimates for distribution and acquisition of local data, the Centerline Data Distribution Center (aka the Working Group for Roads and Transportation Local Road Data Sharing Initiative) will reduce the amount of money spent gathering local data on a local, regional, state, and federal levels by $130,000 a year.

Table 1: Current Expenditures on Acquiring and Distributing Local Road Data

Agency	**Current expenditures**					
	Number of Staff	Staff Time	Counties/ Datasets*	Frequency (annually)	Hourly Wage	Total Cost
Data Acquisition						

DOT GIS	1	0.25	150	2	30	$ 2,250
Other DOT Divisions/Branches	10	0.25	12	3	30	$ 2,700
DENR	15	0.25	12	3	30	$ 4,050
Other State Agencies	8	0.25	150	2	30	$ 18,000
Federal Agencies	10	0.25	150	3	30	$ 33,750
MPOs & RPOs	37	0.25	9	4	30	$ 9,990
County Governments	100	0.25	5	4	30	$ 15,000
Local Governments	50	0.25	5	4	30	$ 7,500
Total Amount spent on acquiring local road data	231					$ 93,240
Data Distribution						
County Governments	1	0.17	100	100	30	$ 51,000
Local Governments	1	0.17	50	100	30	$ 25,500
Total Amount spent on distributing local data	2					$ 76,500
Total Amount (Distribution and Acquisition)	229					$169,740

*DOT GIS, Other State Agencies, and Federal Agencies Estimated based on 100 Counties and 50 Local Governments Collecting Local Road Data, other estimates based on experience at an MPO

Table 2: Projected Expenditures on Acquiring and Distributing Local Road Data after CDDC Implementation

Agency	**Expenditures after the CDDC**					
	Number of Staff	Staff Time**	Counties/ Datasets*	Frequency (annually)	Hourly Wage	Total Cost
Data Acquisition						
DOT GIS	1	0.09	150	2	30	$ 810
Other DOT Divisions/Branches	10	0.09	12	3	30	$ 972
DENR	15	0.09	12	3	30	$ 1,458
Other State Agencies	8	0.09	150	2	30	$ 6,480
Federal Agencies	10	0.09	150	3	30	$ 12,150
MPOs & RPOs	37	0.09	9	4	30	$ 3,596
County Governments	100	0.09	5	4	30	$ 5,400
Local Governments	50	0.09	5	4	30	$ 2,700
Total Amount spent on acquiring local road data	231					$ 33,566
Data Distribution						
County Governments	1	0.09	100	12	30	$ 3,240
Local Governments	1	0.09	50	12	30	$ 1,620
Total Amount spent on distributing local data	2					$ 4,860
Total Amount (Distribution and Acquisition)	229					$ 38,426

*DOT GIS, Other State Agencies, and Federal Agencies Estimated based on 100 Counties and 50 Local Governments Collecting Local Road Data, other estimates based on experience at an MPO **Based on 5 minutes per dataset for upload and download, which may be high considering you can upload and download multiple datasets in the interface.

Case #2: Surface water data sharing through stakeholder development

In 2004, the North Carolina General Assembly requested the NC Geographic Information Coordinating Council and the Department of Environment and Natural Resources to develop an implementation plan to improve the digital surface waters of the state. The Stream Mapping Working Group developed a five-year $16.2M plan for developing the high resolution digital surface water mapping dataset.

Through the Hurricane Recovery Act of 2005, the General Assembly provided funding for the first phase of production encompassing nineteen (19) counties in western North Carolina. Established as the North Carolina Stream Mapping Project, the project dataset is based on the National Hydrography Dataset (NHD) data model. This data model supports various scales of data representation, while meeting a range of analytical and cartographic requirements.

The Stream Mapping Working Group, and later the Stream Mapping Project Advisory Committee, are examples of the stakeholder community joining together to compile and coordinate business requirements to guide technical decisions in the development of the data product. This process helps ensure the end datasets is useful to the broadest range of business requirements across the stakeholder community. The implementation plan identified six business cases for projecting the value of process efficiencies and cost avoidances resulting from the development of the dataset; the projected cost avoidance or efficiency for each case is listed in the following table. Over time, additional business cases will be documented to further increase the ratio between production costs and ongoing maintenance compared to cost avoidances and efficiencies realized across the stakeholder community.

Business Case	Stakeholder(s)	Value of efficiency or cost avoidance
1	**NC Dept of Transportation / Ecosystem Enhancement Program:** Efficiencies gained in better planning support restoration of additional stream miles.	$6,150,000
2	**City of Durham:** Improved surface water mapping will require fewer staff hours to review permits.	$215,730 annually
3	**NC Wildlife Resources Commission:** Increased efficiency in permit reviews.	$20,595
4	**US Geological Survey:** Time to calculate flood frequency statistics for an ungauged stream reduced from 16 hours to 15 minutes of staff time.	$945 per calculation

5	**Development Community:** Significant reduction in field work required by developers to file permits with NC DENR-Division of Water Quality	$450,000
6	**NC Department of Commerce:** Better decision making for site selection criteria in industry recruitement.	** No value calculated in Implementation Plan*

The NC Stream Mapping dataset also provides a common definition and workflow for the development and exchange of information between users within the community. The dataset utilizes the NHD concepts of *reach codes* and *event tables*. Reach codes are identifiers within the database for relating spatial attributes and business data to stream segments and water bodies. Event tables allow the stakeholders to relate spatial attributes and business data to the network of stream features. Stakeholders will be able to share data by exchanging reach code tables or event tables and relating them to the NC Stream Mapping dataset hosted in NC OneMap. This removes the costly and inefficient process of conflation as a surrogate for data sharing, while simultaneously enabling the efficient sharing of business data across federal, state, and local users.

Case #3: National Agricultural Imagery Program (NAIP)

The USDA-FSA, in conjunction with other federal agencies, acquires growing season leaf-on aerial photography on a yearly basis at 1 or 2 meter resolution. Two (2) meter resolution is the standard for most years with one (1) meter resolution imagery coming up every 5 to 6 years in a recurring cycle. However, to fly 1 meter resolution imagery requires cost sharing from the state and/or another federal agency.

In 2006, the data for North Carolina was acquired at 1 meter resolution during the prime growing season. The state contributed elevation data to the NAIP contractor for use in ortho rectification during post-collection processing. A state can buy up to 1 meter resolution NAIP in any of the years between the scheduled 1 meter flights by contributing to the overall cost of the project and can arrange with the NAIP contractors to deliver NAIP imagery in other radiometric configurations such as Color Infrared (CIR). The advantage of NAIP is that it provides a consistent, current statewide ortho photography data set that can be renewed each year if desired.

DENR Forest Resources uses NAIP as a consistent statewide imagery dataset that is current and because it has full tree canopy. Successive years of NAIP would aid in a forest stewardship program, helping in spotting areas where disease may be gaining a foothold, where vegetation types were undergoing higher than normal change, or to help identify areas where landowners were not following BMP's.

NAIP, especially CIR, can also be used as an aid in identifying potential wetland areas for restoration and protection by the Ecosystem Enhancement Program and the Division of Water Quality Wetlands Unit.

The Natural Heritage Program and the Wildlife Resources Commission are using NAIP imagery to aid in habitat analysis and to assess its loss in significant natural communities over time.

Local governments could also use NAIP imagery in projects that serve the local constituency. Attached is a report and map from a study performed for the City of Salisbury by American Forests, looking at dollar savings related to air pollution removal, carbon sequestration and storage, and storm water issues related to runoff and contaminant loading. Satellite imagery was used for this study by the contractor and is not available as a deliverable due to licensing restrictions. NAIP imagery was not available at the time but could have been used and would have been retained by the city GIS department for follow-up study and other uses.

Case #4 USDA Animal Disease Response

1) From the perspective of the US Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (USDA APHIS VS), the first line of response to animal disease outbreaks in North Carolina is at the state and industry level. Often, the State has already initiated an Incident Command System and is seeking and managing geospatial and epidemiologic data in response to animal disease outbreaks. When an outbreak 1) involves a foreign animal disease or 2) becomes larger or more widespread, to the point where state and industry resources cannot keep up with the incident, USDA APHIS VS is called in to assist.

When USDA APHIS VS gets involved, an Emergency Management Response System is used to capture and store outbreak information on animal exams, appraisals, depopulation, disposal, cleaning and disinfection, and other tasks that need to be managed. It includes a mapping module which allows some simple visualization and selection of point locations for zonation and surveillance/eradication activities. It also allows loading of local data on premises or other background geospatial data from a local source.

The North Carolina Department of Agriculture has developed a non-public Multi-Hazard Threat Database for use during such incidents. This database, populated with data from both state and local governments and from the various animal industries and having GIS and mapping capabilities, is critical when the federal response team from USDA is activated**.** When a state or industry has collected, validated, and manages data within the state, those data can be loaded to the USDA Emergency Management Response System, thus allowing quicker deployment of USDA surveillance teams in the field to support incident management.

Data sharing during these incidents is 1) crucial to quick response, 2) can be crucial to the welfare of animal and human populations, and 3) crucial to the continued trade in livestock and livestock food products around the world.

North Carolina may have the only statewide Multi-Hazard Threat Database of this kind in the United States. It is a very important step forward but is significantly dependent on the input and sharing of current data by and between federal, state, local, and industry partners to maximize its potential. Industry participation seems to rest largely on the ability and willingness of the data receivers to hold the data in confidence and limit access to it to those who have a "need to know" during an incident.

While no quantitative data has been found to specifically show dollars saved through quick and decisive response to animal disease outbreaks, it is assumed that the ROI for the Multi-Hazard Threat Database would be substantial given the level of commerce that exists in North Carolina for animals and animal products.

Case #5: Hurricane Isabel Data Request from FEMA.

In 2002 the North Carolina Department of Agriculture & Consumer Services (NCDA&CS) began collecting and standardizing local county data on a yearly basis. The primary goal was to create a statewide tax parcel layer and a statewide street centerline layer to aid in emergency response and planning. Hurricane Isabel struck the North Carolina Coast in September of 2003 causing extensive damage in eastern North Carolina. The Federal Emergency Management Agency (FEMA) contacted NCDA&CS requesting the tax parcel data for the 26 federally declared disaster counties. NCDA&CS was able to provide standardized data for the region as a result of local government cooperation during the data collection process. FEMA was able to use the data to begin recovery efforts in eastern North Carolina in a timelier manner.

Areas for improvement:

1. Timeliness of data. Create a centralized storage point for county data at the state level. Counties would be able to upload data either on a schedule or as requested. As delivered to FEMA the data ranged from two to six months old.
2. Standardization of attribute data. Once the data was collected, a substantial number of man hours were used formatting the data so that it could be loaded into a single statewide data set.
3. FGDC compliant metadata or a data dictionary. This would help in trying to understand the attributes listed and how they relate to other counties data.

Areas that worked:

1. Local government cooperation. For the most part local agencies were able and willing to send data in a usable format via ftp or by mailing a cd/dvd.
2. Redistribution of a single statewide data set to the federal government for use in disaster recovery. Prevented FEMA from having to request data from local agencies whose main priority would have been recovery and not processing a data request.
3. Cost savings. Due to the lack of an official monetary figure for savings the best measure is probably time. With a completed dataset in hand FEMA was able to begin making

decisions immediately instead of having to wait for data to be collected and standardized for use.

In another case study conducted after H. Isabel, the benefits were identified of having parcel data in place and coordinated statewide in advance of events and having 'core' parcel data published on a regular basis. The report highlights five specific findings for sharing of parcel data for emergency response, including the savings of time to assessors and adjusters for purposes of insurance claims and federal disaster loans, as well as other activities. The report also offers recommendations, including one to identify best practices for coordinating a published version of parcel information at the State level. See ATTACHMENT D2.