

Date: June 15, 2010

Agreement Number: G09AC00089

Project title: Create Central Repository for Transportation Data

Interim report

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Data themes: (list) Transportation infrastructure, roads

Executive Summary *(To be completed for the final report only)*

Write a short paragraph (under 200 words) describing the key successes or outcomes of the project. The interim report should highlight anticipated outcomes and actual milestones, whereas the final report summary should describe the project as completed.

The Kenai GIS Transportation Portal project included extensive outreach and information gathering with stakeholders from member agencies of the Kenai Peninsula GIS Users Group, Alaska ArcUser Group, Alaska URISA chapter, as well as through an oral presentation at the Alaska Surveying and Mapping Conference in Anchorage on February 24, 2010 and via the Kenai GIS Transportation Workshop on May 10, 2010. A series of in-person interviews, focus group sessions and an online transportation data survey were conducted to gather information about available data, work flows and user needs. Digital data and database schemas were transmitted via email and FTP to the project subcontractors. The Kenai GIS Transportation Portal web site has been established at <http://www.kpbgis.org/TransportationPortal/index.html> with information about the project including links to standards, presentations and activities. An online “Road Notes” application was developed to allow remote updates to the central e-911 database. Transportation data sets and web services with associated FGDC metadata and database crosswalking tools, plus a user handbook are also hosted on the transportation portal web site. FGDC metadata records have also been published to the Geospatial OneStop. A grant oversight committee was established and periodic meetings were held throughout the project.

Project Narrative *(Interim and final report requirement)*

a. Describe the project; its tasks, highlights, challenges, and accomplishments. What are your approaches to overcoming impediments to participation in The National Map? Based on your experience what would you recommend for implementation and development for project success (technical, institutional and organizational)?

The goal of this project is to centralize transportation data resources for the Kenai region via a web portal (<http://www.kpbgis.org/TransportationPortal/index.html>) that hosts geospatial data, web services, metadata, database crosswalk tools and other documentation. This web portal is now established as the “one stop shop” for digital road data, eliminating the need to contact numerous entities for regional road information. Extensive collaboration between grant contractors and the Borough staff produced an intuitive web portal and ArcGIS Server web mapping application focused on collecting digital “Road Notes.”

A major impediment to implementing The National Map standard was lack of awareness and familiarity with the standard. Documentation of the geodatabase attributes with real world descriptions were not available until the project was nearly completed, making crosswalking to local data descriptions difficult. Another impediment was the distributed nature of regional transportation data which is maintained by a number of stakeholder agencies. Local and state standards for transportation planning vary greatly from the descriptions used by the FGDC standard.

An initial project task was to compile a list of key stakeholder agencies and point contacts that are responsible for maintaining aspects of the regional transportation infrastructure (see handbook.) Currently, the data are housed and maintained by numerous distributed agencies/entities (and utilized by many more.) Respective agencies/entities will continue to maintain portions of the data under their jurisdiction, but all of the data is now integrated via database crosswalks built to the National Map standard. The priority for the grant has been to collect and analyze various database schemas and develop crosswalks from various source agency databases to the “Trans_RoadSegment” table of the National Map standard. Additional tables from the National Map standard for airports, bridges, gates, culverts, mileposts, railroads, and waterways were also utilized for crosswalking regional data.

Data are primarily maintained by all agencies in ArcGIS, but the Alaska railroad infrastructure is maintained in AutoCAD and many of the entities maintain attribute information in Microsoft Excel. Database crosswalks have been developed using ArcGIS Model Builder. Several stakeholder agencies have existing database designs to address their internal business needs. The Borough’s X-9 Microdata database, State of Alaska DOT’s schema and the US Forest Service have the most extensive internal data models. The Cities, native corporations, State of Alaska Division of Forestry, Kenai National Wildlife Refuge and others did not have firmly established standards and were therefore open to adopt the National Map standard.

Several large geographic areas of the Kenai Peninsula Borough do not have a steward for the digital transportation network. Updates or data improvements for these sections lack a place to be discovered collected edited and compiled. Several hundred miles of this critical transportation infrastructure data are either missing, inaccurate or not current. Most these fall on private and native lands.

Work flow challenges were identified due to varying levels of ArcGIS licensing between e911 centers and the Cities which do not have editing capabilities (ArcEditor is required to edit a replicated geodatabase hosted by the Borough.) Funding has been a stumbling block for the Borough to maintain a current road database. Funds from the grant were utilized to program a digital “Road Notes” application (<http://mapserver.borough.kenai.ak.us/addressing/>) that runs on top of the Borough’s existing ArcGIS Server application. Digital road notes can be used by the Cities and other entities to mark the locations where updates or corrections to the central database should be made. The digital “Road Notes” application has streamlined the existing work flow that was previously cumbersome and a manual process. Prior to this project none of the existing workflows was designed to integrated directly with GIS data.

Another challenge for the project fell into the area of legal verses practical access. In many cases, unnamed alleys actually provide access to residences/businesses addressed for e911 calls, but these unnamed alleys are not part of the Borough’s database of maintained roads resulting in confusion for emergency responders. The Borough’s “Master Street Address Guide” is governed by legal accesses, and permitted by ordinance. Allies, trails, driveways, easements and traditional routes fall outside of the responsibility of the Borough ordinance and are not maintained as part of a centralized transportation data set. In the case of 4WD roads, there are numerous access routes that are not legal right-of-ways but are important for the interagency incident command when it comes to managing forest fires. It was decided to filter the “practical access routes” that fall on private land out of the public domain data set that is made available to

the National Map, but to make this data available to emergency service providers. This was handled through coding the “Distribution Policy” as either for “Emergency Service Provider” or “Public Domain – Free Distribution to Third Parties.” This also addressed the concerns of the native corporations that were only agreeable to sharing information on private logging roads for emergency management.

An online transportation survey was developed using SurveyMonkey. The survey was distributed to a broad list of stakeholder entities for feedback. The survey reinforced stakeholder needs for a centralized repository and highlighted the absence of several potential user groups including Dispatch and Public Works/Roads Departments. The majority of respondents were existing GIS users who use GIS for Cartography and Planning; advanced GIS functions like analysis and geocoding were rarely being performed but interest in developing these capabilities was shown. Hard copy maps still account for much of the information sharing. Several variations in data format, coordinate system and accuracy that make integration more difficult are present.

A focal point of the grant was the Kenai GIS Transportation Workshop which was held on May 10, 2010 and attended by over 30 stakeholders from various agencies. The morning portion of the workshop included an overview presentation of the grant findings and products plus a panel discussion to engage upper level management. The afternoon portion included training on using the National Map standard, the new Road Notes application developed with ArcGIS Server and use of the standard via a field exercise with Trimble GPS units running ArcPad.

The implementation and successes of this project relied heavily on leveraging existing technical resources (software, hardware and staffing primarily of the Kenai Peninsula Borough) and existing coordination established through informal collaborations to maintain portions of the data. The grant gave us the opportunity to take a big picture look at the workflows surrounding the maintenance of transportation data, to streamline existing business processes and establish a common standard that makes it possible to merge disparate data. Strong support from the Kenai Peninsula GIS User Group and the grant oversight committee was also key.

b. Describe the data content provided to The National Map. Are there any use restrictions? Are your map services and data documentation (metadata) registered in Geospatial One-Stop? What is the status of maintaining, updating and serving themes of data that are included in The National Map? Based on your perspective and project experience describe user requirements for a national level spatial data infrastructure.

A central repository for transportation data within the Kenai Peninsula Borough has been established with funds from the FGDC grant. The web site is hosted and maintained by the Kenai Peninsula Borough. Airports, bridges, gates, culverts, mileposts, railroads, and waterways provided to The National Map via the “Transportation” tab at the following URL: <http://www.borough.kenai.ak.us/GISDept/Downloads.html> Data are provided as ArcGIS shapefiles and geodatabases. Each data set includes metadata that meets the Federal Geographic Data Committee (FGDC) standard. Metadata has been published to the Geospatial One-Stop. Open Geospatial Consortium Web Feature Services (WFS) are running in a test environment on

the Borough server with ArcGIS Server version 10. These WFS services will be linked to the portal this fall.

Kenai Peninsula Borough staff from the GIS Department and the Addressing Officer from the Planning Department has been trained in the maintenance procedures for utilizing the ArcGIS database crosswalks and the quality control review of data entered via the new “Road Notes” application.

Private roads on native owned lands are not publicly accessible. Managers have concerns about trespass issues but GIS practitioners recognize the need for collaboration. However, these roads and off-road trails may be relevant in the case of emergency response. The protocol for handling this sensitive information is to code the “Distribution Provider” as “Emergency Service Provider” and to only grant access to these data for the Office of Emergency Management and interagency incident command.

In the Summer of 2011, the Alaska Division of Forestry is planning to inventory roads that were built as part of the Forest Practices program. Many of the roads built on native lands were constructed with Forest Practices funding. This project will utilize the interagency Kenai Transportation Portal and will hopefully contribute updates to the regional data set. It’s likely that there will be many updates to the “private” logging roads built with Forest Practices funds. These logging roads fall outside of the Borough’s “Master Street Address Guide” but the Alaska Division of Forestry has expressed an interest in maintaining these data.

In order for users to implement The National Map standard, the level of awareness needs to be increased and some level of technical hand holding needs to be provided to stakeholder agencies to implement the standard. Based on our effort, we believe that the Kenai project would have benefitted from additional funding for implementation support.

c. Describe the operational capability to maintain and update data through periodic updates of data made available to The National Map.

Open Geospatial Consortium standard (WFS) services will be publicly available via the Kenai Transportation portal. These services will be maintained by the Kenai Borough GIS Department as part of routine maintenance for services to tied to various online mapping tools currently available to the public. These services can be harvested by the National Map as needed.

The Kenai Peninsula GIS Department hosts a directory of geospatial services via ESRI’s ArcGIS Server version 10 in a test environment. These services will become public in the fall of 2010 at the following URL: <http://mapserver.borough.kenai.ak.us>

d. Discuss the issues, difficulties, and challenges (technical, institutional, and organizational) that were encountered. Do you need assistance? If so, what type of assistance do you need?

Administrative challenges were encountered which delayed the establishment of subcontracts to conduct tasks for the grant. The KPEDD does not have in house GIS expertise and therefore

established an external review committee to review progress on the grant. Confusion on reporting requirements and duplication resulted.

It would be helpful if the USGS Google site included current documentation for the Transportation data model schema, an associated data dictionary for the fields, and live data samples with FGDC metadata.

A technical challenge for the project was the implementation of Open Geospatial Consortium Web Feature Services (WFS) with ArcGIS Server version 9.3.1 (which did not work.) WFS services for the transportation data sets are running in a test environment with ArcGIS Server version 10, but this server will not be rolled into production until the fall of 2010.

e. Describe your relationship and issues with the USGS. Has a formal ongoing agreement been established to provide data to The National Map? Describe your plans for follow-on activities. What are the terms and mutual commitment of resources? Please attach copy of written agreement if available.

An MOU was signed on April 1, 2009 by the Kenai Peninsula Borough Department of Planning, Kenai Peninsula Borough GIS Department and Kenai Peninsula Economic Development District in support of the USGS FGDC Cooperative Agreement Program award to create a Kenai GIS Transportation Portal. Maintenance of the Transportation Portal will be handled through the Kenai Peninsula GIS Users Group with web site development support from the Kenai Peninsula GIS Department. No formal agreement is in place for providing data to The National Map but it is assumed that the Borough will continue to maintain live web services indefinitely.

The Kenai Peninsula GIS User Group may consider the next round of FGDC CAP announcements to secure additional funding for ongoing implementation of The National Map standards.

If any **photographs, graphics, or illustrations** of the project in action are available please include a couple or more of these.

1. Kenai GIS Transportation Portal:
<http://www.kpbgis.org/TransportationPortal/index.html>

Kenai GIS Transportation Portal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.kpbgis.org/TransportationPortal/index.html

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Kenai GIS Transportation Portal

Home Data Committee Contacts National Map KPB User Group

City Council Member, Seward Alaska:

The digital road data available via the USGS DRG "is so outdated that it still shows the old road from Port Avenue to the naval station across the airport, Bayview school, Fourth of July Creek running straight west to the bay before the levy was built or the prison, and an inaccurate west city limits boundary. No current residential developments, the middle school, or long term care facility are shown either."

Road Notes Application

- > View the Guidelines

Presentations

- > ASMC 2010 (4MB)
- > ASMC 2009 (3MB)
- > Focus Group Slides
- > ArcGIS Online Evaluation

Other Links

- > www.twitter.com/KenaiGIS; login is fgdc2009
- > View the full proposal
- > Project plan: timeline of tasks
- > National Transportation Data Model
- > v9GIS

★ View the new Transportation Handbook

In 2008, the Kenai Peninsula GIS User Group conducted a preliminary data needs survey and transportation data was identified as a top priority. As a result, a decision was made to pursue a collaborative pilot project to improve regional transportation data with funding from the USGS Cooperative Agreement Program. The goal of this project is to improve work flows among the agencies responsible for maintaining this information and to enhance access to transportation data via an online data portal. A \$50,000 grant was awarded to the Kenai Peninsula Economic Development District (KPEDD) to direct this grassroots effort; view the award [here](#). The grant has a \$50,000 in kind match requirement, agreed to by the Kenai Peninsula Borough Planning and GIS Departments; view the Memorandum of Understanding [here](#).

Local GIS professionals with an intimate knowledge of the Peninsula will be contracted to work under the direction of the KPEDD [grant oversight committee](#) to perform this work.



Regional GIS data from city, borough and state entities will be enhanced with federal standards to improve the [National Map](#).

News

- 24 February: Kenai GIS Transportation Focus Group on 4WD roads - [meeting notes](#)
- 17 February: Interagency database crosswalk refinements
- 29 January: Meeting with ESRI and KPB to discuss "Road Notes" implementation via ArcGIS Server
- 28 January: Project meeting with Ninilchik Native Association
- 25 January: Focus group with City of Seward (Fire Chief, Dispatch, and Planning Department)

Done

Transportation data downloads are now embedded within the Kenai Peninsula Borough's GIS Department web site.

Kenai Peninsula Borough GIS - Mozilla Firefox

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http://www.borough.kenai.ak.us/GISDept/Downloads.html

Kenai GIS Transportation Portal | Kenai Peninsula Borough GIS | Kenai Peninsula Borough GIS

KPB Home | Our Government | Our Economy | Our History | Our Geography | A Pictorial Visit | Other Sites

Kenai Peninsula Borough - Alaska

Geographic Information Systems

GIS Home | Interactive Parcel Viewer | Downloads

Data Downloads

Select a theme and download the desired format

Administrative | Cadastre | Control | Hydrography | **Transportation** | Layer Files

The data below represents the collective resources of many Kenai Peninsula government agencies, in participation with USGS's *The National Map* effort. [Read More](#)

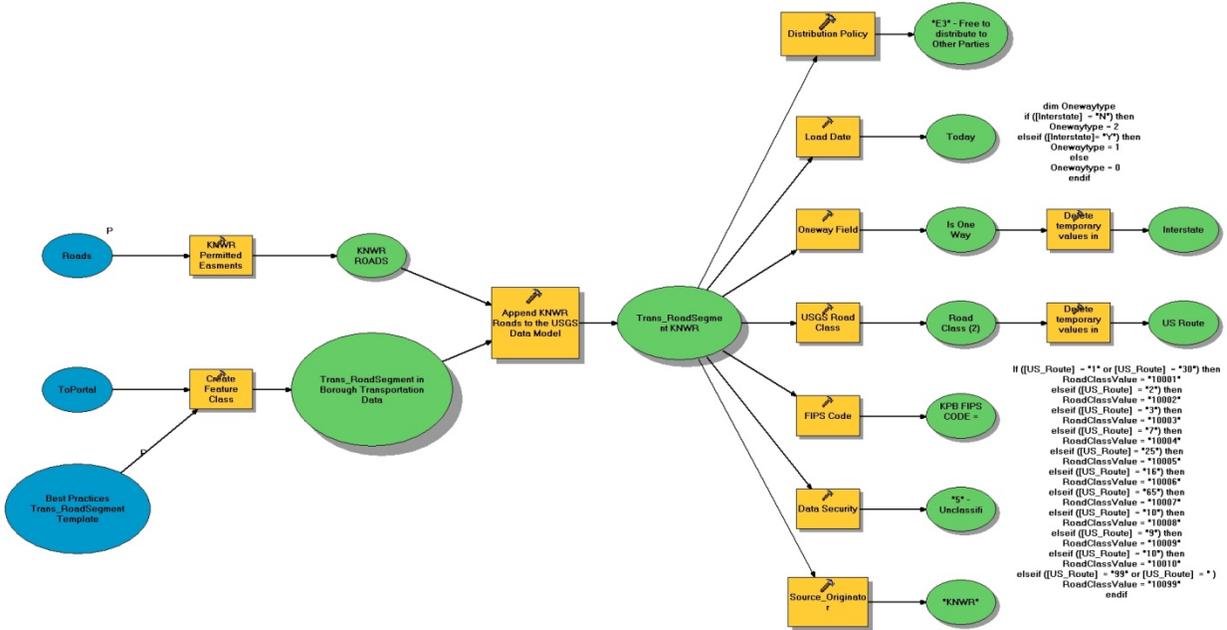
[VIEW THE TRANSPORTATION HANDBOOK](#)

These downloads require a USERNAME ("fgdc") and PASSWORD ("trans"):

	<p>Airports VIEW METADA VIEW SNAPSHOT Includes the locations of airports, seaplane bases and heliports.</p>	<p>SHP PGDB DWG WFS <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>
	<p>Bridges, Gates and Culverts VIEW METADA VIEW SNAPSHOT Includes the locations of bridges, gates and culverts.</p>	<p>SHP PGDB DWG WFS <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>
	<p>Mileposts VIEW METADATA VIEW SNAPSHOT Distance markers (in approximately one mile increments) along state highways or other major roads in the Kenai Peninsula Borough.</p>	<p>SHP PGDB DWG WFS <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>
	<p>Railroads VIEW METADA VIEW SNAPSHOT Includes railroad data from the Alaska Railroad Corporation.</p>	<p>SHP PGDB DWG WFS <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>
	<p>Roads (Public) VIEW METADATA VIEW SNAPSHOT Includes information on Federal, State, Borough, City and Native Association roads.</p>	<p>SHP PGDB DWG WFS <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>

Done

2. Example of Cross walk built between the City of Seward, Kenai Peninsula Borough, DOT and the National Map's "Trans_RoadSegment" table standard.



Feedback on Cooperative Agreements Program

What are the program strengths and weaknesses?

Strengths: The program proved to be a powerful tool in the effort to help develop GIS collaboration but not without a few drawbacks. Most of the local GIS users commonly work with USGS digital products and have recognized the importance of maintaining a current and accurate information infrastructure. The existence of this type of grant lets the isolated GIS user, which is common here in Alaska, know they are not alone. The USGS name lends credibility to the concept that collaboration is the solution to efficiently maintain large datasets across multiple organizations.

Weaknesses: The USGS transportation data standards differ from the core components used by local transportation. Terminology and definitions that are most important at the local level are not present in the model which makes it difficult to apply this standard for everyday business processes. Additionally some of the more obscure fields could use some more clarification in order to be maintained properly.

Where does the program make a difference?

The program makes a difference in the minds of stakeholders at the managerial level in local governments. Federal support of these types of initiatives lends credibility to the use of unfamiliar technologies to solve existing problems with data sharing.

Was the assistance you received sufficient or effective?

The Alaska USGS Liaison, Craig Seaver was extremely supportive and helpful throughout the grant process. He was available and provided valuable guidance in a timely manner. Additionally he was an important presenter at our one day transportation workshop. Technical assistance could be improved. It was time consuming to find a current template for the geodatabase schema.

What would you recommend doing differently?

I would focus on making the standard more aligned with the local needs. It would also be good to simplify the online reference page and include a section devoted to technical support and maintained with the most current data model.

Are there factors that are missing or additional needs that should be considered?

It would be good if the transportation model had a feedback mechanism available to users to make sure it is meeting the local needs which will add value and incentive for local users to adopt the model.

Are there program management concerns that need to be addressed? Time frame?

The time frame for this project was too short. Local users were interested in working end products and at the point that progress begins towards this end funding is finished and program ends. Long term maintenance success is difficult without multi-year guidance. Bringing the project into maturity would require more time to transition local users well into the maintenance phase.

If you were to do this again, what would you do differently?

I would pull back the breadth of the project to focus on an individual theme. The broad nature of transportation model makes it difficult to address any of the individual data needs accurately given the size and scope of the grant.