

The Need for a National Address Database – Use Cases

A Report Submitted by the National Geospatial Advisory Committee December 2014

Introduction

Government and business alike depend on addresses to provide essential services. Street addresses are collected and used every minute of every day for emergency response; the consumption of commercial goods and services; mail and package delivery; public and private utility management; voting; taxation; licensing; financial lending and real estate transactions; road maintenance and transit services; market analysis; environmental stewardship; economic development and land use planning; and many other purposes.

Address data are required across all levels of government, as well as within the business community. A single, highly accurate national database would improve the efficiency and effectiveness of business processes within governmental agencies that currently use address data that has been collected from multiple sources. At the federal level alone, addresses are deeply embedded into the daily responsibilities of the following agencies and represent just a fraction of the need for address data:

Agency	Activity
Department of Transportation	Next Generation 911, construction design and notification, transportation planning
Federal Emergency Management Agency	Locating those impacted by disasters & critical infrastructure/assets
Department of Health and Human Services (including Centers for Disease Control)	Public health incident tracking, disease vector control and data-driven management of entitlement programs
Consumer Finance Protection Bureau	Home Mortgage Disclosure Act implementation
Census Bureau	Mailing Census forms, locating households for in-person visits, geocoding results
Social Security Administration	Providing Social Security payments
Department of Housing and Urban Development	Providing affordable housing, making sound and equitable land use and housing decisions, project notification

Addresses are a cornerstone of our social, commercial, environmental and political systems. The better the address data, the more efficiently and effectively these systems function and the more services that can be provided to improve quality of life for all.

Currently, address data are managed at multiple governmental levels and in private industry in a largely uncoordinated fashion. Many agencies collect and maintain address data independently and without the ability to compare their records with a verified master address file. Under current practices, work is duplicated and time and money are wasted. However, beyond that, when an address is missing, incorrect or difficult to locate, operating costs escalate dramatically. Customers and service providers experience delay and frustration. Professional and business reputations suffer and lives, property and other important on-site resources may be lost.

A Brief History of Addressing Within the NGAC

In 2012, the National Geospatial Advisory Committee (NGAC) developed a white paper assessing the need for development of a National Address Database (NAD). That white paper recommended the creation of a NAD that included:

- Contributions from and access by all sectors of the economy
- Aggregating and integrating local address data
- Conducting a formal benefit-cost analysis to identify best development options

The NGAC passed a resolution in September 2013 reiterating this support and encouraging the FGDC to develop a funding strategy to implement a NAD. As a continuation of this engagement, in 2013 the FGDC asked the NGAC Addressing Subcommittee to:

- Identify and document a set of compelling business cases that support the need for a NAD
- Provide feedback regarding options for incorporating Addressing more effectively into the A-16 Data Theme framework

The result was the following Vision Statement for a NAD:

“The National Address Database is an authoritative and publicly available resource that provides accurate address location information to save lives, reduce costs, and improve service provision for public and private interests.”

To achieve this vision, the NAD is conceived as:

“A continuously updated, nationwide, publicly available address database, with associated geographic coordinates, that meets the needs of Federal, Tribal, State and local stakeholders. The database stores all residential and non-residential structures and interior units, mailing addresses, plus other locations of critical interest (for example, highways, bridges, and landmarks). This database is an inventory and a standards based, distributed network of sources rather than a single, centralized database. Most address data are developed locally, with local and state custodians acting as regional integrators who merge local data into region-wide databases. The data are updated in a timely and quality-controlled manner. Federal stakeholders consume and use locally developed and aggregated address data stored in a standardized National Address Database.”

In 2014, the NGAC formed an Address Subcommittee to provide ongoing input on this effort. Specific tasks requested of this committee included the following:

- Identify compelling use cases demonstrating the value and utility of a NAD
- Describe the potential relationship between a NAD and National Parcel Data and identify possible opportunities to coordinate and leverage the two efforts

The discussion and effort of the NAD Subcommittee included participation from federal, state, local and tribal governments, as well as the private sector. The Subcommittee prepared seven use cases, which are appended to this document. Each use case illustrates and supports the need for a NAD.

Use Case 1: NAD Projected Savings within the Federal Government

The Federal Government could benefit greatly from a NAD. The U.S. Census Bureau requires continuous access to tribal, state and local addresses, along with associated geospatial data, to update the Master Address File (MAF) used in the Census. Participation by tribal, state and local governments in building a NAD could save the Census Bureau \$196 million for just the 2020 Census. Agencies involved in Federal Disaster Declarations also have a need for immediate access to a NAD. The Federal Emergency Management Agency (FEMA) requires highly detailed, site-specific address information (which could be provided if the NAD was created) in the preparation/creation of accurate exposure and impact assessments. During Super Storm Sandy, FEMA recognized a \$4 million cost savings by acquiring and using granular address data, in conjunction with remotely sensed data, to generate rapid geospatial damage assessments. Lives, time and money could have been saved if FEMA did not have to assemble this address data after the event occurred.

Use Case 2: Consumer Finance Protection Bureau (CFPB) - Home Mortgage Disclosure Act Use Case

The Home Mortgage Disclosure Act (HMDA) requires that financial institutions, which lend mortgages, collect and submit data about those mortgages to the federal government. Currently, the location of the loan is identified by U.S. Census Tract. A recently released proposed regulation would require a specific address location that could be geocoded to identify a geographic X, Y location. By using an existing NAD, the CFPB – HMDA would increase efficiency, reduce errors caused by using coarser U.S. Census tracts, all while increasing compliance with Federal law. A universally available NAD would reduce the cost of individual agencies accessing address data, as well as the overall costs for all federal agencies using the NAD.

Use Case 3: Addresses and the Emergency Response Community Use Case

The primary goal of the emergency response community is to deliver services at the scene of an incident as quickly as possible. Faster response and initiation of mitigating action lessens the potential negative outcome, which initiated the call for help. Well-defined and known incident location data are critical to mitigating loss. Because incidents do not respect man-made boundaries, the need for a NAD that could be shared across jurisdictional boundaries is critical for success. A NAD would provide responders from other jurisdictions standardized critical local information and an improved framework for Federal reporting. A NAD would potentially save lives in small-scale multi-jurisdictional incident, as well as larger scale incidents involving multiple jurisdictions.

Use Case 4: State of Arizona Business Case

Arizona's need for a statewide address database was evident when trying to identify the level of broadband services available throughout the state as required by the Arizona Broadband Mapping Project. This effort exposed Arizona's lack of a consistent and reliable statewide address database that was needed to meet the requirement of the project. Arizona was able to build a multi-jurisdictional address database that provides consistent and current address data, which is used by all levels of government for public safety, emergency response, highway safety and streamlining sales tax, as well as for the delivery of many other governmental services to the public. Arizona is an example of how local

and state efforts can be leveraged and integrated into developing and maintaining a statewide address database that could become part of the NAD.

Use Case 5: Tribal Use Case

There are more than 560 Federally Recognized Tribes in the United States. For many of these Tribes, addressing is a significant issue with which they struggle. Most Tribes do not have the resources to develop, build or maintain a master address file. Indeed, just collecting address data can be difficult because the data often do not exist. Additionally, access to Tribal data can be difficult because of cultural sensitivities. A NAD-supported tribal address database would greatly benefit the Tribes. It would provide a standard access point for Tribes to use to share GIS addressing and road data and would allow for greater sharing of data between Tribes and the federal government.

Use Case 6: Lexington County, SC Use Case

Lexington County, SC, like many counties, continues to grow and add new addresses regularly. The county receives numerous requests from multiple Federal agencies requesting copies of the same current address databases. The creation of a single NAD, consisting of integrated local address data and used by all local government agencies, would provide a single point of contact for those requesting the data. This would lead to efficiencies both for those wishing to obtain the most current address database and for the county staff that manage and respond to those requests.

Use Case 7: Boone County Missouri Master Address Database Voter Registration Integration Use Case

The Boone County, Missouri Clerk and Voter Registration Office are responsible for overseeing a registered voter population of more than 100,000. Boone County experienced numerous challenges balancing the voters-per-polling location with varied election turnout numbers and keeping accurate voter precinct assignments based on voter addresses. In 2011, the Boone County Clerk and the Voter Registration Office began the integration of the GIS Master Address Database into their existing election information system to support the County's 2010 decennial Census reapportionment and subsequent GIS precinct and district realignment. The implementation of this consistent address database has improved data integrity and has helped to ensure the availability of an accurate and reliable voter registration database.

Conclusions

In OMB Circular A-16, the vision of the NSDI is described as:

The NSDI assures that spatial data from multiple sources (federal, state, local, and tribal governments, academia, and the private sector) are available and easily integrated to enhance the understanding of our physical and cultural world.

Address data are arguably the most prominent example of information that is needed by all branches of government and all levels of society. Because of the proliferation of mapping applications, it could be argued that address data are perhaps the most widely used type of geographic information in society. Yet we do not have a single reliable source for national address information. As documented in the appended use cases, it is logical and appropriate that the Nation should move forward with the creation of a NAD.

The NGAC recommends the FGDC community take the following actions:

1. Add Addresses as a new theme in the FGDC's National Geospatial Data Asset (NGDA) framework or as a dataset under an existing NSDI theme; and identify a theme lead or dataset manager, respectively. This is necessary because although address locations are the single most important data resource for spatially enabling programmatic data, they do not fit into any of the existing list of FGDC NSDI framework themes (geodetic control, orthoimagery, elevation and bathymetry, transportation, hydrography, cadastral and governmental units)
2. FGDC agencies, including the Census Bureau, Department of Transportation, and other agencies, should coordinate and collaborate with partners in the development of a business requirements plan for a NAD during FY 2015. This effort should include meeting(s) of executive level NAD stakeholders to identify requirements for the development of and maintenance of a NAD.
3. The NAD business requirements plan should:
 - Establish a governance plan for the NAD
 - Define long-term, sustainable funding strategies
 - Leverage existing stakeholder and partner investments in address databases
 - Identify best practices from existing work at the state and local level
 - Identify immediate short-term actions to quickly establish a NAD
 - Identify long-term strategies to improve the NAD to incorporate major stakeholder and partner needs
 - Assure that NAD strategy aligns directly with local public safety and other existing programmatic drivers that will maximize the currency, completeness and accuracy of the NAD
 - Identify a schedule of milestones and list of performance metrics for the development, production, and maintenance of a NAD.

Use Case 1: NAD Projected Savings within the Federal Government

Department of Commerce

Within the Commerce Department, the NAD could play an important role in reducing the overall cost of the 2020 Census. The Census Bureau needs continuous access to tribal, state and local address and geospatial data to capture the results of local changes. While tribal, state and local governments are, for the most part, open to sharing their data with the Census Bureau, their participation in data sharing programs is inconsistent. That is because under current law (U.S. Code Title 13), the Census Bureau can collect address information from communities but is prohibited from giving any information back so that the local communities can improve and update their address lists. Feedback from local government partners indicates frustration that they do not directly benefit from the partnership. The Census Bureau would be able to use the NAD to populate its Master Address File (MAF). Because the address data in the NAD will not be restricted under Title 13 of the U.S. Code, the Census Bureau will be able to expand its partnership programs by providing detailed feedback to the state, local, and tribal partners about their address information.

Jurisdictions participating in the NAD would improve the MAF. Prior to the 2010 census, the Census Bureau hired temporary workers to walk every block in the U.S. to check the accuracy of its address list. This on-the-ground address collection cost \$459 million. Thus, each 1% reduction in the cost of address listing and canvassing prior to the next census would equate to approximately \$5 million in cost avoidance. Additionally, the 2010 Census spent almost \$1.7 billion visiting addresses during Non-Response Follow Up operations and when checking vacant houses. The NAD would allow the Census Bureau to significantly scale back on address listing prior to 2020 and also could help field workers more effectively locate addresses, significantly reducing field costs and potentially saving hundreds of millions of dollars. As an example, the Census Bureau is currently researching increased use of local government partner electronic address file processing. The Bureau found that the use of a partner-supplied address file decreased the number of ungeocoded addresses in Sussex County, Delaware from 23,873 to 13,307. This reduced the ungeocoded workload in Sussex County by 44%, suggesting that major savings could be realized by lessening the field workers workload if more local governments could be persuaded to share their address files.

Estimated Cost Avoidance for the Census Bureau with Investment in the NAD

Census Operation	Total Cost in 2010 Census	Estimated Cost Avoidance with the NAD
Address Canvassing	\$443,591,299	\$35,733,480
Nonresponse Follow-up	\$1,589,397,886	\$159,744,030
Non-ID	\$3,725,555	\$983,082
Total	\$2,036,714,740	\$196,460,592

As a second federal government example, consider the National Oceanic and Atmospheric Administration (NOAA). NOAA would benefit by gaining access to geocoded addresses in coastal areas of the U.S. where an estimated 39% of the population now resides. These coastal communities face an increased risk from extreme coastal storms like Super Storm Sandy and Hurricane Isaac, which severely damaged infrastructure and property in 2012. The ability to access a NAD during Sandy would have been helpful to confirm that marinas and houses identified by New York State were, in fact, contaminated with oil. Recent requests for tax parcel data and information for New York state have

come into NOAA's Office of Response and Restoration, Assessment and Restoration Division working on post-Sandy clean-up efforts. This is because much of this data is only available through the New York Clearinghouse and access requires prior approval and interagency agreements. Access to this data from the Census Bureau via the NAD would provide sufficient information to NOAA to obviate the need for a duplicative and inefficient data collection exercise.

The National Marine Fisheries Service within NOAA also would likely benefit from a NAD. There are a number of databases that use addresses including fishing permit systems and metadata repositories. Potential uses of a national database would include auto-fill and validation/Quality Control of these databases. The cost savings realized would result in time savings for staff resources in all of the NOAA regions to track down data entry errors.

Department of Housing and Urban Development (HUD)

The NAD could reduce costs substantially in U.S. residential mortgage markets and allow more accurate private and public understanding and better-informed federal regulation of those markets. Federal agencies that regulate and monitor the housing finance system could benefit significantly from the development of the NAD, as could private firms that participate in housing finance. Property address information stored in the NAD could provide the basis for a federally sponsored national mortgage registry that records information about mortgage loans taken out to finance individual properties and provide that information to regulatory agencies and investors in a manner that protected proprietary information and borrower identities. Dissemination of such information would allow investors to evaluate more accurately the credit risk of individual mortgages and allow the government to monitor more accurately the aggregate leverage and risk in U.S. mortgage markets, contributing to a more efficient and stable housing finance system.

Unlike some other industrialized nations, the U.S. does not have national standards for identifying residential properties. Though many local jurisdictions use computerized cadastral systems (public records, surveys or maps of the value, extent and ownership of land) as a basis of taxation, there are no federal standards for residential property identifiers or records management requirements. Entities working with residential property data typically combine data elements from disparate sources (for example, postal addresses, latitude/longitude coordinates known as geocodes, information from the Public Land Survey System, and local county or jurisdictional land use maps, and local parcel identifiers) with internally assigned property identifiers.

The absence of a national residential property identification system imposes costs on private firms that participate in and support residential mortgage lending and on housing finance regulators and other government agencies. Firms and agencies must hire vendors, lease software or otherwise expend resources to match property addresses or other data elements in mortgage loan records to merge information in different datasets, assess whether the same property has multiple outstanding liens, and identify repeat purchase or refinance transactions for individual properties to estimate repeat-sales house price indexes. Such data matching is necessarily imperfect. As a result, misidentification of properties or related loans is a source of costly mistakes for the mortgage industry and contributes to the incidence of fraud. Further, it is difficult for mortgage lenders or investors to track second liens on properties, which hampers accurate assessment and pricing of the credit risk of first mortgages and accurate management of mortgage credit risk.

The absence of unique property IDs and imperfect data matching using existing data elements in mortgage loan records, make it difficult for housing finance regulators to assess the credit risk of, and

limits the accuracy of risk-based capital requirements such regulators impose on housing finance institutions. It makes it difficult for the government to monitor aggregate leverage in the housing finance system. As a result, we have no detailed, accurate picture of the role that second liens played in the buildup of leverage in the housing finance system prior to the recent financial crisis.

Federal agencies would achieve direct cost savings from the industry's use of NAD-assigned property IDs. Once such IDs were widely available in mortgage loan records, the Federal Housing Finance Agency (FHFA), for example, would save \$40,000 per year now spent to "scrub" addresses to match transactions for the purpose of estimating FHFA's suite of house price indexes. In addition, FHFA's house price indexes could become more accurate as a larger number of repeat transaction pairs were used for index estimation. Other agencies that lease address-scrubbing software or perform address matching would also achieve savings.

Further, FHFA and the Consumer Financial Protection Bureau (CFPB) are in the process of creating a National Mortgage Database (NMDB) that will contain loan-level information on first lien residential mortgages in existence at any point in time from January 1998 forward. The NMDB is designed to be a nationally representative, 1-in-20 random sample rather than a universal mortgage loan registry. The NMDB is being built from representative data from Experian, a national credit repository; from Fannie Mae and Freddie Mac; and from government agencies which insure or guarantee residential mortgages. As part of this effort, FHFA has purchased access to the entire national property database of CoreLogic and contracted with Experian to merge that data into the NMDB database through a third-party blind matching process that uses personally identifiable information of borrowers but protects the privacy of that information. If NAD-assigned residential property IDs were widely available in mortgage loan records, that matching process would be more accurate and less costly, but it is unknown how much FHFA could save.

Additional benefits to the U.S. housing finance system could be achieved if each NAD-assigned property ID was linked to unique mortgage loan IDs for all loans that financed the property through a federally sponsored national mortgage registry. With appropriate safeguards to protect personally identifiable information related to borrowers, the registry could make the NAD-assigned ID for a property, limited information about the property's geographic location, and the loan IDs for all mortgages on the property available to private firms that had a permissible purpose. For example, potential or actual investors in first mortgages or pools of first mortgages could access information about open second liens on properties financed by the first liens. That would allow more efficient pricing and management of mortgage credit risk by the industry. Further, regulators and other government agencies could use information stored at the registry and the NAD to assess more accurately the credit risk exposures of individual financial institutions and aggregate leverage in the housing finance system. The pace at which these benefits were achieved would depend on enactment of legislation that authorized such a registry and the timing of its creation.

HUD has an enterprise geocoding service that cost \$750,000 per year to run address validation and geocoding. The challenge HUD faces is in address maintenance leading to substantial duplicative geocoding. There is a current initiative to develop a master address inventory aligned with a NAD, creating efficiencies within both agencies.

Department of Homeland Security

The Department of Homeland Security (DHS) estimated a cost avoidance of \$2 million per year for address data access. This did not account for the benefit of time savings for incident response such as

survivor identity validation and eligibility, individual housing assistance, damage assessments, and public assistance.

FEMA requires an accurate, updated and complete NAD to accomplish its numerous statutory missions and to support the National Response Framework (NRF), National Preparedness System and Presidential Policy Directive (PPD) 8: National Preparedness. Specifically, FEMA requires an authoritative, comprehensive and seamless nationwide inventory of residential and non-residential structure locations (to include interior units and their associated mailing addresses). The purpose of this requirement is to enable emergency management (incident management and incident support), search and rescue, survivor assistance, crisis and operational mapping; resource and logistics routing; and safe navigation of FEMA staff and supporting federal, state, local, and tribal emergency response personnel.

The following FEMA functional areas would benefit most from having access to a NAD:

- Preparedness and planning
- Situational awareness
- Analytics and assessments (for example, damage assessments, exposure and impact assessments, etc.)
- Decision making
- Resource allocation, staging, and deployment
- Provisioning of services to disaster survivors and public entities

A NAD would enhance the quality and accuracy of FEMA analytics. FEMA requires highly detailed, site-specific information (such as proposed by the creation of a NAD) in the preparation/creation of accurate exposure and impact assessments. Current geospatial assessments have (at times) been constrained due to generalized and/or aggregated block or block group level data. For example, for flood events, FEMA requires detailed hazard and address information to accurately determine population exposure as well as economic impacts.

A national, point-based address dataset would provide FEMA a GIS-enabled layer that would support advanced geoprocessing tasks and rapid geospatial damage assessments during and immediately following disasters. This layer would enhance FEMA's ability to expedite geospatial damage assessments (and possible grant assistance) following significant events.

During Hurricane Sandy, FEMA recognized a \$4 million cost savings by acquiring and using granular address data, in conjunction with remotely sensed data, to generate rapid geospatial damage assessments.

In addition, FEMA invests between \$200 million and \$300 million annually for mapping and insurance studies. Access to a national, high-resolution address dataset would likely yield overall cost savings and more accurate and impactful products through the sharing of a single authoritative address dataset across all of the FEMA program offices.

United States Postal Service

Currently, the Census Bureau maintains a partnership with the U.S. Postal Service (USPS), which provides the Census Bureau with its Delivery Sequence File (DSF) of mailing addresses throughout the U.S. However, the partnership is not as effective as it could be. The Census Bureau compares the DSF to the MAF, updates the MAF with new addresses, and assigns each new address to its correct geographic location, thereby geocoding each address. The USPS, which requires an accurate address list to deliver

mail, has requested address and geographic information in return, which the Census Bureau is unable to supply under current law (U.S. Code Title 13). In the NAD environment, the Census Bureau would be able to geocode these addresses and share them at the address level, which would allow the USPS to validate the accuracy of their database and serve to enhance mail delivery. Any updates the USPS made as a result of this exchange would feed into the NAD and ultimately the MAF. A list of the geographic coordinates associated with each address would enable the USPS to better analyze the volume of their mail base and more precisely optimize their carrier routes.

State, Local and Tribal Governments

At the state level, savings would also be significant. In 2000, local governments in Ohio, along with electric and gas utilities, were spending an estimated \$80 million to \$100 million on digital mapping activities. According to the GIS Manager for the Ohio Department of Transportation, “In an emergency, response times are critical. The first few minutes can make the difference between life and death. Mistakenly dispatching an ambulance, fire engine or police cruiser to the wrong location or using mapping data that provides “best estimate” rather than precise locations can prove disastrous. If we can provide a dataset that gets them there a few minutes early, you can’t put a price on that.”

Some other illustrative examples include Waukesha County, Wisconsin, which spent \$116,000 in 2001 to collect approximately 150,000 addresses. The county spends additional resources in meeting duplicative state and federal requests for address information.

The State of Georgia spent \$1,517,000 in preparing for the 2010 Census Local Update of Census Addresses (LUCA) program, including the submission of more than 3 million addresses. Some feedback received by the Census Bureau included comments that geocoding and parsing address lists was difficult and time consuming. “Even after all this work over parts of two decades in preparing for decennial censuses, I am sad to say Georgia still does not have a statewide address database that we can share with our federal partners, or to use for our own purposes. That’s why the idea of a standard NAD that we can build together and that is not Title 13 restricted, is such an attractive concept. We certainly need to share with the Census Bureau, but we also need it for emergency management, for hazard mitigation planning, and other purposes.”

International

Internationally, in 2002, the Danish government released its address data to the public resulting in a cost savings of \$18 million annually with seventy percent of the economic benefits to the private sector, benefitting the economy directly, and thirty percent to the public sector.¹ In 2001, the Australian Government provided access to its spatial data free of charge. The benefits of providing this data to the public are estimated at around \$25 million per year.² It can be inferred that the United States would see a similar return on investments with the creation of the NAD.

¹http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=15&ved=0CFQQFjAEOAo&url=http%3A%2F%2Fuk.fm.dk%2Fpublications%2F2012%2Fgood-basic-data-for-everyone%2F~%2Fmedia%2FPublikationer%2FImported%2F2012%2FGode%2520grunddata%2520til%2520alle%2FBasicData_UK_web_2012.10.08.ashx&ei=7ujnUf3jE8LI4AOzvoDQBA&usg=AFQjCNEeUeREVbnWGkTAbq-elOPNtT2ipQ&sig2=LkRPpLxOzPwwAgxoDPJynw

² <http://ands.org.au/resource/cost-benefit.html>

Use Case 2: Consumer Finance Protection Bureau and the Home Mortgage Disclosure Act

Introduction and Need

Congress enacted the Home Mortgage Disclosure Act (HMDA) in 1975. It requires that the certain financial institutions that lend mortgages collect and submit to the federal government data about those mortgages. The intent of the act is to provide financial institution regulatory agencies and the public with loan data that can be used to assist:

- In determining whether financial institutions are serving the housing needs of their communities;
- Public officials in distributing public sector investments so as to attract private investment to areas where it is needed; and
- In identifying possibly discriminatory lending patterns.

HMDA collects, among other things, the loan type, the amount of the loan, the financial institution granting the loan, the gender and race of the borrower and the location of the loan. Currently the location of the loan is identified as the U.S. Census tract that contains the loan, *but recently released proposed regulations would require a specific geocodable address location*. The HMDA data collection results in approximately 20 million loans records a year from about 7,000 financial institutions.

Current Situation and Challenges

The Dodd–Frank Wall Street Reform and Consumer Protection Act transferred authority over the regulations implementing HMDA from the Federal Reserve Board to the Consumer Finance Protection Bureau (CFPB). The CFPB recently released for comment a revised regulation package, which changes some of the data to be collected. Currently the Federal Reserve Board provides a solution which financial institutions use to geocode the addresses for loans. This solution returns the U.S. Census tract containing the loan, allowing the financial institution to return the tract in the data collection. Currently unknown amounts of error in loan records locations are precipitated in the HMDA process. In addition, when the CFPB geocoding solution does not match an address and cannot provide a census tract code, financial institutions are still required to track down and report the tract location. Many financial institutions then turn to local governments to find and use local GIS services or GIS contacts to acquire Census tract information, either through an online map service or a phone call. Some financial institutions require this information to be acquired as the mortgage application is being processed. Some banks use this “map” and map information to present a picture of the loan to others who have to review or approve the loan. This collection process, sometimes requiring two steps, pushes a burden of geospatial analysis on the financial institutions.

In the recently released for comment, CFPB new regulatory rules confirmed that the practice of geocoding loans continues. CFPB’s primary goal in implementing these new rules is to reduce (or at a minimum keep constant) the burden of collection while increasing value in the collection through adding fields, and increasing granularity. For example, the new rule as written would require the inclusion of an address as a location field rather than just reporting the census tract of the loan location.

The proposed address-reporting requirement confirms the limitations of the current situation: the lack of a single, up-to-date authoritative source for geocoding loan locations increases reporting burden and reduces data accuracy. In many current cases, new loans (or loan applications) are recorded in locations where addressing has yet to be recorded; in rural areas where geocoding accuracy is poor; or in group or

transient quarters (such as trailer parks), where geocoding could be, and often is, ambiguous. The sum total of these issues results in an error cost to the financial institutions that are required by law to report accurate data. These accuracy issues, along with the coarse granularity of the tract level, also compromise the ability of regulators to properly evaluate lending practices, as required by the law.

NAD Impacts and Results

Having a NAD as a single authoritative government source from which a single authoritative geocoding solution can be deployed provides an opportunity to achieve several goals. First, the availability of a NAD would reduce the burden of geocoding on financial institutions (particularly if there is modern developed services technology). Second, a NAD would reduce confusion about geocoding errors if an authoritative source cannot find the loan location. Third, a NAD would reduce the government-wide costs associated with duplication of geocoding solutions that have resulted from the lack of a coordinated approach. If this NAD could be streamlined to gather the latest data continually from local governments via state governments into a federal dataset, there would be no need for institutions to research local government resources through phone calls or web services. This, in turn, would reduce the burden placed on local governments.

Use Case 3: Addresses and the Emergency Response Community

Introduction and Need

The overarching objective of the emergency response process is to deliver services at the scene of an incident as quickly as possible. Faster response and initiation of mitigating action lessens the potential negative outcome of the event or situation that prompted the call for help. Travel time - the time required to travel to the incident location - is usually the longest time segment in the response process. Reducing it through the use of standardized address data represents a significant opportunity to improve life saving measures, minimize damage and reduce financial loss.

Current Situation and Challenges

The use of geospatial systems by emergency responders varies widely across the United States. Some jurisdictions can afford complex computer aided dispatch (CAD) systems complete with mobile display terminals (MDT) capable of showing a multi-layered, GIS-driven map in every response vehicle. Other organizations are lucky to have reasonably accurate paper maps. In either case, the ability to look at a map accurately depicting an address' location significantly aids navigation and reduces travel time, especially when responding to unfamiliar locations. The latter is becoming increasingly common as public safety funding decreases and multi-jurisdictional responses are relied on more frequently to provide coverage across greater areas. Thus, even where address data are available through individual, locally sponsored efforts, a lack of standardization and completeness across broad areas limits the effectiveness of such data.

The availability of a standardized address database has further benefit with respect to response time. The overwhelming majority of Enhanced 911 (E911) calls are received from cellular telephones. Callers, particularly those traveling roadways at night, often do not know their location. The ability to reference a caller's location, as captured by most all E911 systems, with respect to a known, standardized address would be of tremendous value to the emergency responder community. Such an address reference, when included with dispatch information, would improve response times.

Visualizing the location of an address during the response process not only speeds delivery of services, but aids with critical decision making. A fire department can reference a map with an address to determine which hydrant is closest to the structure on fire. Emergency medical services may not have to hunt in the dark for house numbers posted in different locations (front porch, mailbox, front door or missing entirely). Police attempting to cordon off an area gain a better understanding of where to position themselves when arriving on scene.

Finally, the ability to plot the location of an address on a map enables the use of coordinates, such as the U.S. National Grid (USNG), in the emergency response sector. Data from the National Fire Information Reporting System (NFIRS) suggests that approximately a third of all fire department calls do not occur at pre-defined a street address. Aliasing NAD points with U.S. National Grid coordinates would facilitate finding both difficult to locate known addresses such as those with no posted house numbers, addresses set back significantly from roadways and not easily seen, or locations destroyed/damaged by disaster such that traditional means of navigation using street name/house number are no longer functional. By extension, familiarization with coordinates through such uses would extend value to helping locate non-addressed incident locations such as pipeline ruptures, accidents along highways, outdoor fires, missing-person searches and similar events.

The devastation wrought by Hurricane Katrina and events of equal violence often render the landscape unrecognizable and exemplify the need for a NAD. Local responders are often incapacitated or completely overwhelmed, requiring state and Federal resources for assistance. The latter often travel hundreds, and sometimes thousands, of miles to render aid and are not familiar with the local landscape prior to destruction, let alone after. Yet they are often tasked with actions such as “Search 1054 Main St. – Mrs. Smith, a 74 year old woman was last known living alone at that location and her family indicates that she did not evacuate.” Navigation in such an environment, where street signs, house numbers and homes themselves are in complete disarray, makes such a daunting task ever the more difficult. Further, while Federal agencies such as FEMA have adopted the U.S. National Grid coordinate system for meeting such needs, few address databases in existence alias an address to a coordinate. Such would greatly facilitate search and rescue and many other response and recovery related tasks after disaster has struck.



NAD Impact and Results

Such cases are, unfortunately, not unique and clearly demonstrate the need for a NAD to assist the emergency responder community as they provide life-saving services by cutting down response times, improving decision making abilities, and providing a common address layer critical during multi-jurisdictional responses. The case studies also strongly suggest that every entry should be aliased to a USNG coordinate, thereby providing a true “Geo-Address.” The benefits of a NAD within the emergency response community would extend from the Federal to the local level. While difficult to quantify, if just one life were saved, the effort would be justified.

Use Case 4: State of Arizona

Introduction and Need

Arizona's long-time need for better address data was evident in 2009 when trying to identify the level of broadband services available throughout the state as required by the Arizona Broadband Mapping Project. By receiving a grant from the National Telecommunications and Information Administration (NTIA) Office to improve the delivery of broadband services in Arizona, the Arizona Strategic Asset Technology (ASET) collaborated with the Arizona State Land Department State Cartographer's Office (SCO) to provide mapping services to support Broadband development planning services. It was quickly determined that there were several counties in Arizona without GIS address data at all. It was also found that the address data in those counties that did have it were not standardized and were of varying quality. Arizona received funding for the Arizona Broadband Address Project to develop address data, which would allow Arizona to comply with providing spatially accurate broadband service data as required NTIA.

NTIA Broadband funds provided the seed funding for Arizona to develop GIS address data. The SCO was able to contract with private sector GIS consultants and the Arizona 911 State Office to develop address data in the remaining three counties that still did not have address data. They were also able to develop an updated GIS address standard for use by the 911 community, and integrate county address data into a standardized statewide database to meet the geocoding requirements of the Arizona Broadband Mapping Project. As this project proceeded, the Arizona Department of Transportation (ADOT) partnered with the SCO and 911 State Office, contributing funds and helping to identify all public roads, paved or unpaved, to meet new U.S. DOT highway safety requirements. ADOT was able to obtain information about non-federally funded public roads, roads that it was not previously required to track, and to provide services to edge-match roads where they crossed jurisdictional boundaries and provide more accurately located road centerlines. The address and road network "data development workflow" was modified to meet the needs of each partner.

Current Situation and Challenges

Many State agencies are now partners in Arizona's efforts to develop and maintain a unified *All Roads Network* with current and accurate address data. Several agencies are also benefitting from this data.

- The Arizona State Forester's Office provides improved address data to the National Fire Center.
- The Department of Public Safety Arizona Counter Terrorism Information Center (ACTIC) uses the more accurate addresses to respond to and map incidents.
- The Arizona State Land Department uses address data to manage Arizona's Trust Lands better.
- The Department of Revenue uses address data to meet Arizona's Simplified Tax requirements so that taxes may be collected at the point (address) of transaction.
- Discussions also are underway with Arizona's Department of Environmental Quality, Department of Education, Department of Economic Security and Health Department to participate in developing, maintaining or integrating the address data into their business operations.

To facilitate the sharing of standardized statewide address data, the Arizona Geospatial Clearinghouse (AZGEO) was developed to provide access to statewide address and roads data required for the Broadband Mapping Project, the 911 community and the ADOT. AZGEO provides simplified access to databases that are developed and maintained by partners so that the data can be extracted to meet their business needs.

There is a challenge to develop standards that allow address data to be used effectively for public safety, emergency response, simplified tax administration, health service delivery, geocoding services, and other business needs. It is also a challenge to develop security procedures that protect data shared by different agencies from unwanted disclosure. Additionally, the following non-technical issues are being addressed.

- The need to identify long-term governance and funding for AZGEO and the services it provides.
- The need for an institutional infrastructure that ensures the long-term sustainability of AZGEO and the consolidated address data it contains.
- The need for partners that share data and participate in developing and contributing address and roads data and services to have confidence that AZGEO is worth their investment and participation for the long-term.
- The need for a tie-in with the NAD and standards which could provide long-term data integration opportunities, quality assurance processes and resource support for continued local and state address development and integration efforts.

NAD Impact and Results

While the efforts to develop and maintain a statewide address and roads database are producing efficiencies in Arizona, the development of a NAD would provide even more benefits. Arizona, other state and local governments, as well as the federal government would benefit from a NAD that is developed in cooperation and participation with major stakeholders. A NAD could reduce the number of separate agencies developing inconsistent address data by providing incentives and processes for participation, national standards and consistent approach to data creation and maintenance that can be applied to many business cases across many jurisdictions. Address data is created at the local level, and if resources were made available for local and state agencies to share and integrate their address data, federal agencies could obtain highly transactional, consistent address data at a fraction of the cost to develop and maintain a NAD on its own.

By integrating local and state efforts into developing and maintaining a NAD, the nation would have consistent and current address data that could be used by all levels of government for public safety, emergency response, aiding communities after catastrophes occur, highway safety, Streamlined Sales Tax, and the delivery of many other services to benefit the public.

Use Case 5: Tribal Governments

Introduction and Need

There are more than 560 Federally Recognized Tribes in the U.S. Each Tribe is unique in its own culture and governance. There are approximately 56.2 million acres of Tribal Trust lands broken up into 326 Indian land areas. Not all Federally Recognized Tribes have Trust Lands. The Bureau of Indian Affairs, Office of Trust Services currently provides GIS software, through an enterprise license agreement, to 333 different Federally Recognized Tribal Governments. However, many Tribes do not have a GIS office or person. Often it is a part of an individual's total responsibilities in an Environmental, Utilities or Emergency Management department. In some areas, one Tribe may be responsible for numerous Tribes' GIS data in the area.

Current Situation and Challenges

Addressing is a big challenge in Indian country. Some Tribes, such as the Eastern Band of Cherokee, have high quality address data for each residence and building, as well as linear referenced and accurately geocoded roads. However, many other Tribes have little to no addressing data and many roads are not mapped or even named.

There is no central contact or unified voice for Tribal GIS offices or activities such as a National States Geographic Information Council (NSGIC). There are some small regional groups, but a "NSGIC for Tribes" would be of great benefit in developing standards for addressing in Tribal lands.

Numerous Federal agencies undertake the grueling task of trying to obtain updated Tribal data each year. This is a costly task with mixed results. Tribes are cautious of the multiple requests received from multiple federal agencies for their data. The small individual GIS offices of the Tribe often do not have the capacity or resources to supply data for numerous federal requests. One of the most common comments from Tribes is "why doesn't the Federal Government have just one agency act as the point contact for Tribes."

As with all other government entities, Tribes prefer to maintain ownership, and be the stewards, of their data. Nevertheless, most Tribes are open to sharing data, preferably with one designated agency and contact. They also prefer to have formal data sharing agreements in place. Once Tribes build "trust" relationships with an agency and its personnel, they feel more comfortable with sharing data.

During emergency and disaster situations, it is very difficult in some areas to obtain Tribal data. Either the Tribe is omitted from the data search or the collection process is very costly for FEMA and other agencies that may be involved.

NAD Impact and Results

A NAD would be well supported by Tribes. It would serve as the central point for Tribes to work with and share GIS addressing and roads data. The Tribes would be better able to meet requests for their data. The time and cost savings for both Federal and Tribal resources in working with Tribes on GIS data would be a great benefit to each. Having addressing shared across agencies would be a great step forward in which other Federal agencies could spend more time working with Tribes on a landscape-level approach on issues.

Use Case 6: Lexington County, SC

Introduction and Need

There are 3,077 counties (including parishes and boroughs) in America. Most develop their own address data but some contract with another entity to develop its data. For example, Lexington County, South Carolina adds 3,000-plus addresses annually. Nationally, this is probably a good average to use to judge the level of effort for all counties. These addresses reflect new or converted residences, businesses, industries, government and nonprofit entities. No one beyond the local agency will have all those addresses unless there is a data sharing system that a NAD would provide.

Current Situation and Challenges

Today each federal agency that wants current, local addresses has to contact each county (except in a few states that maintain statewide, current address databases). Many federal requests are sent to the county administrator or the current or former elected leader. Each county then determines which department has the data. It may take days or weeks of forwarding the request before the correct department receives the request. Then that relevant department fulfills the request in the order in which it received the request, not the order in which the request came to the county. From the time the request is received by the county, several weeks may pass before the request is fulfilled.

Several federal agencies or quasi-federal agencies already request and receive local address data. The U.S. Postal Service is in daily contact with the county requesting follow up information on the addresses the county sends to them. Other local agencies who receive this data daily include all cable, telephone, gas and electric utilities, whether privately or cooperatively owned.

In addition to these who receive daily or weekly updates, other federal agencies that periodically request and receive data include:

- FEMA – for use in planning and remediation for flood events.
- CDC – to do a public health survey & analysis following a catastrophic event.
- Health Statisticians – for disease analysis related to where disease outbreaks occur and in proximity to what nearby other factors.
- HUD – quality analysis of accurate distribution of funds to those in need.
- Nuclear regulatory agencies – to evaluate disease or disease rumors related to nuclear facilities.
- GAO – for analysis of what data are used by local agencies and how they are distributed to other levels of government (for example, the Census Bureau) and other agencies and authorities (for example, NG911).
- Homeland Security – for critical places planning in case of terrorist attack. Lexington County is home to the airport for Columbia, SC, Lake Murray, which provides water to several hundred thousand people, 3 U.S. Interstate highways, a major regional mall and one Fortune 500 headquarters.
- FCC and FAA – for cell tower site issues.
- FAA – for clearance for runways, noise abatement issues on runways, and planning and analysis for noise with current and future runway plans.
- Bureau of the Census – for monthly new construction.
- Bureau of the Census for Local Update of Census Addresses (LUCA) program prior to the decennial census. LUCA is Local Update of Census Addresses a Census activity designed to improve the master address file used by the Census once each 10 years.

NAD Impact and Results

Impact of the NAD would be threefold. First, each federal agency could get the latest address database possible. Second, none of the agencies would have to send requests to the county staff at all. This should save considerable work time for federal employees. Third, county staff would not have to expend effort to be certain the right county department responds to the request. On the county side of the equation, this could save anywhere from 2 - 6 days of work for one employee annually.

Financial estimates related to a NAD:

1. Lexington County - fulfilling requests with NAD/ annual savings \$ 1,300
2. Lexington County - not doing LUCA each Census/each 10 years \$29,000

There are more than 3,000 counties that would eliminate Item 1 each year, resulting in estimated savings exceeding \$3.9 million annually to counties nationwide.

National savings to counties from not doing LUCA each Census (Item 2) are estimated to exceed \$40 million. Note: not all counties participate in LUCA, so the actual number of LUCA participants was used to estimate these savings.

The “savings to counties” includes budget and staff time that does not have to be allocated for that particular task. By “saving time and budget” on one activity (in this case, fulfilling federal agency requests for data), counties can allocate that staff time toward NG911 and other evolving technologies. There are also significant savings for items 1 and 2 on the federal side. Examples of these savings, including cost savings related to LUCA, were identified in Use Case 1.

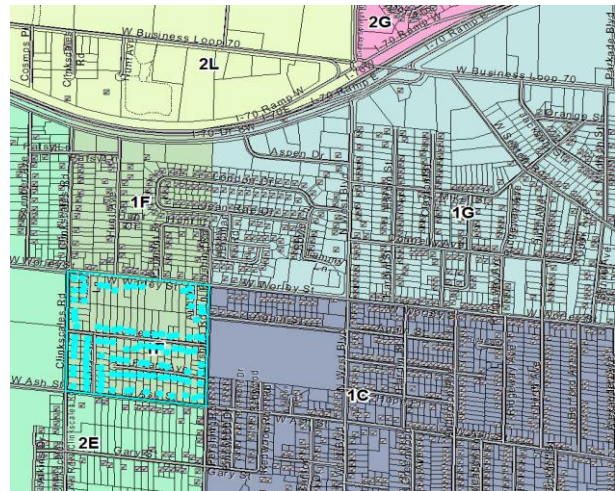
Use Case 7: Boone County Missouri - Master Address Database Voter Registration Integration

Introduction and Need

The Boone County Clerk and the Voter Registration Office is responsible for overseeing a registered voter population of 100,711 (2012 General Election) in an area covering 691 square miles of suburban/rural mix in central Missouri just north of the state capital. Although Missouri counties are not subject to Section 5 of the Voting Rights Act, Boone County has sustained challenges related to balancing the voters-per-polling location and varied election turnout numbers and keeping accurate voter precinct assignments based on addresses for all voters, including an ever growing and changing student population of the University of Missouri. In 2001, with strong support by the County Clerk, Boone County began the development of a GIS Master Address Database. The project, which originally began in 2002 as a two-month outsourced project with a price cap of \$4,400, quickly turned into more than the vendor bargained for. It ultimately took internal staff until 2006 to complete the development and field verification of the dataset. After a number of years of additional dataset review, in 2011 the Boone County Clerk and the Voter Registration Office began the integration of the GIS Master Address Database into their existing election information system and elections related GIS datasets to support the County's 2010 decennial Census reapportionment and subsequent GIS precinct and district realignment. Unfortunately, although growing in popularity at the local and county levels, the availability of accurate and up-to-date address data is fragmented at the national level.

Current Situation and Challenges

Since the master address database was integrated into the voter registration system, the Voter Registration Office has identified and reviewed more than 4,000 records where the voting precinct for a given address did not match the underlying mapping or didn't match an existing address in the GIS. Another challenge that was resolved was the requirement that within the voter registration system, the address given by the voter must be entered and stored as provided, even if spelled incorrectly, contained erroneous information, or missed key elements of the address. This was achieved by a series of data integrity processes that identified records with non-standard, voter-provided addresses and linked them to the corresponding official address from the master address database, while still retaining the address originally provided by the voter. The master address database was also used to develop projections of precinct voter populations to adjust precinct boundaries, optimize polling locations based on expected turnouts, and to standardize the street name and address range information within the voter registration system that is used to determine where voters reside.



NAD Impact and Results

Antipathy toward taxation without representation was one of the founding principles of our nation. It continues today in County Clerk Offices everyday as new voters register to vote or existing voters move to new addresses and have to be assigned to their correct voting district and precinct. The election

system has undergone significant technological advances since the first election. A NAD would further ensure that every citizen is consistently and accurately assigned to the correct voting precinct and are able to vote for all of the Election Day ballot items pertinent to their address.

Voter registration and election related geography is continually changing between elections as new annexations are recorded or new tax entities are enacted. It is critical to the successful management of this process that the spatial and attribute information contained within the master address database is accurate, current and accessible. On the local, state, and national scale, this will reduce staff demands to answer phone calls and office visits by voters leading up to and on Election Day. Another area where savings will be realized is related to the Voter Rights Act and its requirement that all registered voters receive sample ballots prior to each election. An authoritative standardized NAD that is used by both the County Clerk and USPS would reduce issues with addresses failing pre-authorization tests needed to be eligible for USPS bulk rate discounts, and would also reduce the number of ballots returned by the USPS due to incorrect addresses. Furthermore, support and integration of the NAD into an International NAD (InterNAD) would aid in the compliance with the Uniformed and Overseas Citizens Absentee Voting Act and the Military and Overseas Voter Empowerment Act by improving the effective and timely delivery of absentee ballots.