

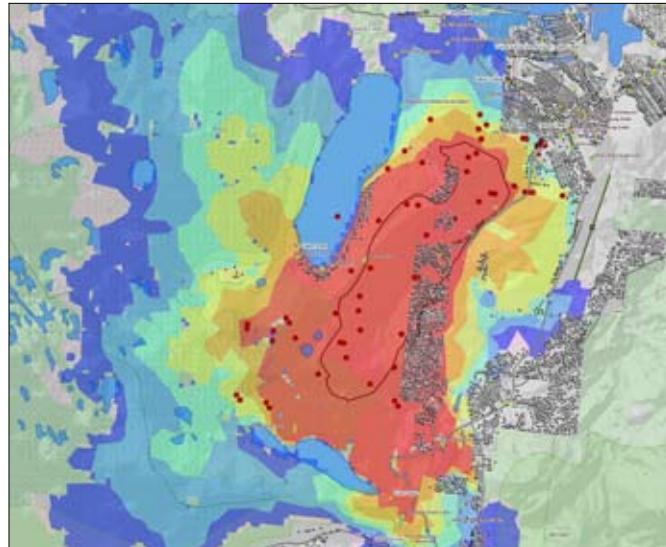
## National Land Parcel Data: A Vision for the Future

Land parcel data—information on the boundaries, ownership, value, zoning, and other aspects of property—provide critical information to support emergency response, business activities, and the daily operation of local governments. There are many benefits to having complete and consistent digital coverage of land parcel data across the nation, but parcel data are not nationally integrated in the United States. This National Research Council report recommends actions needed to establish a nationally integrated land parcel data system.

The availability of land parcel data—information on the rights, interests, ownership, and value of land—affects our lives in countless ways. For example, when major wildland fires sweep through an area, the U.S. Forest Service can locate the fires using satellite imagery and use sophisticated models to predict where they will spread. But it is land parcel data that lets them answer key questions about what is in the fire's path. Are there houses or other buildings in the way, and who owns them? Who should be alerted to the impending danger? Are there areas with a high density of buildings where the Forest Service should be focusing their efforts? Digital land parcel data can inform all of these questions. By combining fire spread predictions and land parcel data, fire fighters can get the information they need to save property and lives.

Following such natural disasters as hurricanes or tornados, parcel data are needed to know whose property was affected, whose utilities need to be restored, and who is eligible for disaster recovery funds. Digital land parcel data can allow agencies and relief organizations to get help to the right people efficiently and effectively.

Information about the boundaries, ownership, value, zoning, and other aspects of



Land parcel data help firefighters know what lies in a fire's path. This map combines fire spread predictions (red indicates immediate fire danger) with parcel data (black dots indicate buildings) to help determine where firefighting efforts should be focused. SOURCE: USDA Forest Service, courtesy Kevin Hyde, METI.

property is also key to the daily operations of local government. Without knowing who owns what land, local governments could not do tax assessments, plan locations for new roads and utilities, or the many other things we depend on them to do.

All local governments have land parcel data for their areas, and many have them in digital form. But to be able to use these data for such situations as wildland fires, tornados, flooding, or hurricanes that cross jurisdictional boundaries, land parcel data need to be in a

consistent digital form, integrated across the whole country, and easily accessible to those who need it in a timely manner. Although the need for nationally integrated land parcel data has been known for a long time, they do not currently exist in the United States.

At the request of the Bureau of Land Management, the Census Bureau, the Federal Geographic Data Committee, the Department of Homeland Security, and Environmental Systems Research Institute, the National Research Council assembled a committee to assess the current status of land parcel data in the United States and the challenges to developing nationally consistent land parcel data across the country. The report concludes that a nationally integrated land parcel data system is necessary, timely, technically feasible, and affordable, and outlines the organizational framework and programmatic needs to support such a system.

### Integrated Land Parcel Data is Critical

Land parcel data are currently stored in a variety of incompatible formats that can vary widely from county to county across the United States. This lack of nationally integrated data has resulted in significant information gaps in some areas and inefficient redundancy in others.

There is a digital divide: only about a third of U.S. counties have converted their land parcel data



Digital land parcel data are shown here overlaying an aerial image. Although digital parcel data are available in some areas, two-thirds of U.S. counties store parcel data only as lines on paper maps in local court houses. SOURCE: Delaware County Auditor's Office.

parcels in the country; about 70% of all parcels now have digital data. But the remaining 30% are located in the roughly 2,000 most rural counties in the country, and often only exist as lines on paper maps stored in local court houses. Although these counties have fewer total parcels, they also do not have adequate financial resources to convert their data to digital form. On the other side of the digital divide, many urban areas are covered by two or three versions of parcel data. There are even parcel data programs that reflect real-time changes in real estate transactions or show new street addresses recorded by global positioning system (GPS)-enabled hand held computers.

The lack of nationally integrated land parcel data has led to duplication of effort among various levels of government and between the public and private sector. For example, in any given area, the organizations collecting parcel data from local governments may include an insurance company to determine if houses are in a floodplain, the Department of Housing and Urban Development so they can accurately manage one of their housing programs, the U.S. Forest Service so they can fight fires, a private mapping company so they can sell it, and Zillow.com so they can show it on their website of home value estimates.

A nationally integrated, digital land parcel data system could alleviate much of this redundancy and ensure that accurate information about all areas of the country can be readily accessed when needed.

### Challenges to Developing a Nationally Integrated Land Parcel Data Program

With the currently available infrastructure of geospatial technologies and web-based technologies, integrating land parcel data nationwide is technically and economically feasible. Many technical barriers to achieving such a vision have been overcome; the remaining challenges are primarily organizational. The question appears to be not whether the federal government has the need, resources, or authority to implement a national parcel data program, but rather whether it has the motivation and incentives to confront difficult institutional and financial obstacles.

The organizational and political challenges involved in a nationally integrated land parcel data program are significant. Given that there are thousands of counties or other government entities that

## Vision for a Nationally Integrated Land Parcel Data System

The report recommends a system of land parcel data that is housed with appropriate data stewards but accessible through a central web-based interface. Data stewards will generally be local governments, but will also include land management agencies at other levels. This land parcel data system would include the following attributes:

- A National Land Parcel Coordinator, working with coordinators for federal lands, Indian lands, and each state, would oversee the development and integration of consistent land parcel data across the nation.
- National land parcel data would be in the public domain, but no information would be provided about private ownership, use, or value, in order to protect privacy and confidentiality.
- Built on already existing state and local parcel data systems, the envisioned system would link a series of servers maintained by local and state governments. The system would ideally be able to seamlessly assemble accurate parcel information for any part of the nation at a given point in time.
- Each parcel would be treated as a unique entity whose information would be maintained by local government officials. Local officials would share with the national data system geographic coordinates that define the geometry of each parcel and a minimal set of attributes including street address, unique identification number, a generalized category of ownership (such as international, tribal, state, federal, county, local/municipal, private, not for profit, or unknown), and metadata that describes information about the data (such as the data steward, parcel contact, the date of the data, and other information).

are producers of parcel data, integrating parcel data that spans several counties or states is no simple task. Furthermore, there is little incentive for local governments to adopt a consistent data content standard for parcel data or even to share the information beyond their borders. In addition, there are various legal and political issues such as local government licensing policies, data-sharing issues, and questions regarding what data should be in the public domain and what should be kept confidential to protect privacy.

### Addressing Specific Challenges

*National Coordination:* The Bureau of Land Management has been given responsibilities for national land parcel data coordination and has carried out important activities in this area, but a nationally consistent land parcel data set does not yet exist. A panel should be established to determine whether the Bureau of Land Management has the necessary and sufficient authority and capacity to serve as the federal and/or national coordinator, and if not, it should either be given the authority and resources, or some other agency should be named.

*Incentives for Local Governments:* Although federal and state-level stakeholders believe that nationally integrated parcel data is necessary, many local

governments do not see how a national effort would benefit their own local use. Local governments may be suspicious that development of a national land parcel data set may become another “unfunded mandate,” under which they are required to provide their data for little or no compensation or benefit to them.

Tying the existence of digital parcel data to grant eligibility for federal funds related to property or participation in federal data sharing programs would help promote parcel data development by local governments. Since many local governments have already developed digital land parcel data, this should not present an excessive burden. For those that don’t yet have digital land parcel data, incentives and support will be needed to promote its development.

*Program Planning and Evaluation:* A program to nationally integrate land parcel data must have a comprehensive and accountable business plan. Proven benchmarks and metrics for assessing progress have already been developed by the Federal Geographic Data Committee Subcommittee for Cadastral Data. The National Land Parcel Coordinator should develop and oversee a land parcel data business plan, which should serve as the basis for evaluating the program and as a model for state and local governments.

*Federally-managed Lands:* The federal government, which is the largest land management agency, should develop and maintain an inventory of its own property. A Federal Land Parcel Coordinator should coordinate the development and maintenance of a single, comprehensive, and authoritative database for federally-managed lands, including public lands. This database should include the ownership, area, and use of all federally-managed lands.

*Tribal Trust Lands:* Parcel data in Indian lands is inconsistent across the nation. The Office of the Special Trustee for Tribal Lands should establish an Indian Lands Parcel Coordinator to coordinate the development and maintenance of a database for Indian trust parcels, which could then be integrated with national land parcel data.

*Census Bureau Address Data:* Congress and the Bureau of the Census should explore potential policy options, including modifications to Title 13 of the U.S. Code (which prohibits the Bureau from sharing address data with other federal agencies or local governments), that would allow its digital data on building addresses and their geographical coordinates to be placed in the public domain while also maintaining important privacy protections. If made publicly available, these street addresses and coordinates could be used to assist in the development of parcel data in areas where parcel data sets do not exist.

*State-level Coordination:* Coordination at the state level is necessary for nationally integrating land parcel data and could logically be a part of the Fifty

States Initiative being developed by the National States Geographic Information Council's (NSGIC) in cooperation with the Federal Geographic Data Committee. The National Land Parcel Coordinator should require that every state establish a state parcel coordinator, who should develop a parcel data business plan and manage the relationships among all levels of government involved in parcel production.

*Funding:* Many different sources of funding could support a program to nationally integrate digital parcel data, including intergovernmental cooperation, shared funding, and various incentives. Immediate and sustained funding for the program should be a shared responsibility among all stakeholders. The private sector and local governments are already making substantial investments in parcel data and would realize substantial benefits from a coordinated approach. They are therefore critical stakeholders in the national vision for parcel data. Additional sources of funding, especially from the federal government, would be required to establish new parcel programs in areas where they do not currently exist.

The National Land Parcel Coordinator should develop a plan for a sustainable and equitable intergovernmental funding program for the development and maintenance of parcel data. Many of the funds for this program should come from existing federal programs that require parcel data; however, new funding will be required to establish an initial baseline, integrate the data, and make it available through a web interface.

**Committee on Land Parcel Databases: A National Vision:** **David J. Cowen** (*Chair*), University of South Carolina, Columbia; **David J. Coleman**, University of New Brunswick, Fredericton, Canada; **William J. Craig**, University of Minnesota, Minneapolis; **Cindy Domenico**, Boulder County Assessor, Colorado; **Shoreh Elhami**, Delaware County Auditor's Office, Delaware, Ohio; **Shelby Johnson**, State of Arkansas, Little Rock; **Susan Marlow**, Smart Data Strategies, Inc., Franklin, Tennessee; **Frank Roberts**, Coeur d'Alene Tribe, Plummer, Idaho; **Michael T. Swartz**, First American Flood Data Services, Austin, Texas; **Nancy von Meyer**, Fairview Industries, Pendleton, South Carolina; **Ann G. Frazier** (*Study Director*), National Research Council.

This report brief was prepared by the National Research Council based on the committee's report. For more information, contact the Board on Earth Sciences and Resources (202) 334-2744 or visit <http://nationalacademies.org/besr>. Copies of *National Land Parcel Data: A Vision for the Future* are available from the National Academies Press, 500 Fifth Street, NW, Washington, D.C. 20001; (800) 624-6242; [www.nap.edu](http://www.nap.edu).



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