ROI Analysis Results

Benefits from a Statewide, Consistent, Up-To-Date, Parcel Data Layer

Context: Public Safety

Prepared by VCGI on January 24, 2014

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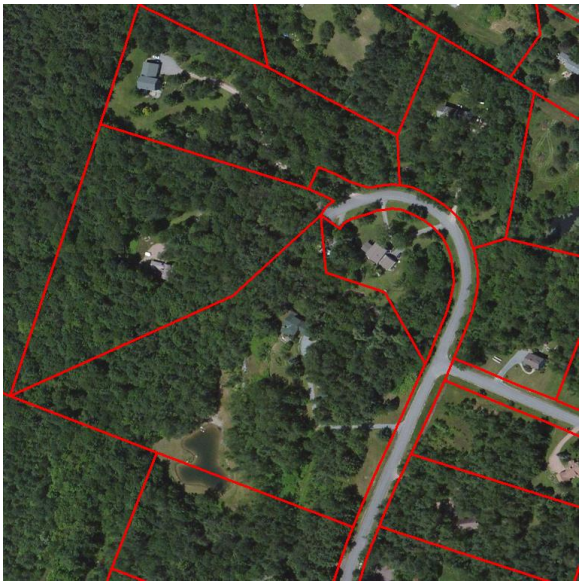
DEFINITIONS

parcel

The definition of a "parcel" as defined by Environmental Systems Research Institute, Inc. (Esri), is:

> a piece or unit of land, defined by a series of measured straight or curved lines that connect to form a polygon.

The term "parcel" typically refers to a unit of real property ownership. An individual lot in a subdivision, whether or not that lot contains any improvements such as buildings, is a parcel. Parcels in multi-level condominiums are sometimes "stacked" as individual units of ownership and are vertically separated by floor levels.



Imagery Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

GIS

According to VCGI, GIS, or geographic information system:

> refers to computer mapping tools and resources. When digital information is geographically referenced (meaning that the information is linked to specific places on the earth, using a system such as Latitude/Longitude) it can be used to create map layers as well as to perform analyses and even model hypothetical situations ("what if?" scenarios). GIS has been used by the defense, natural resources, and planning communities for many years, and is now being used by many more sectors including transportation, marketing, utilities, emergency management, sales, and education, to name just a few.

data layer

Information, or data, which a GIS stores, is organized into thematic layers. These layers are superimposed to produce maps and conduct spatial analysis. For example, a map might be produced by first rendering a layer of aerial imagery, then adding a layer of parcel delineations, and finally, a layer of water supply lines and fire hydrants. For an analytical example, a layer of FEMA flood insurance rate map data can be superimposed to a layer of emergency shelter locations to identify shelters that are not in or

near a particular flood zone.

A data layer often contains more data than the content of its depiction on a map. For example, a data layer of crime reports typically contains more than just a layer of points; Each point often contains a set of attributes, such as the date, time, and type of crime. This marriage of geometric information (a point or polygon's geometric and geographic definition) and tabular information allows a data layer to function as map content and a database.

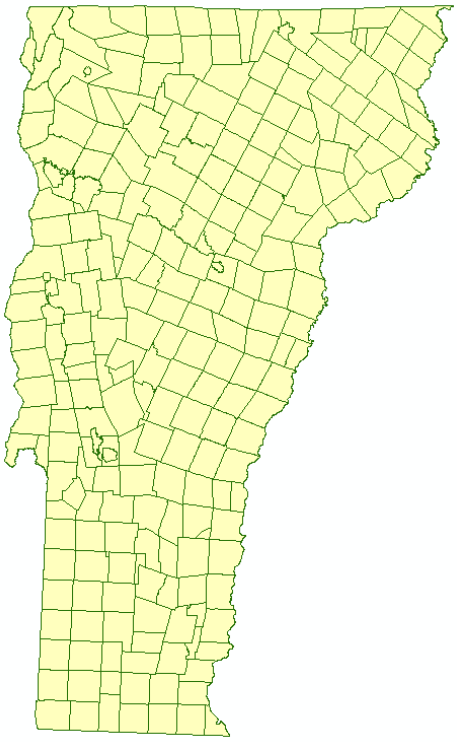
parcel data layer A layer of parcel information that is stored in a GIS. Parcel data is the backbone of a community's GIS. A substantial amount of business processes, whether within government functions or within the private sector, can be related to a parcel data layer. It can be utilized for the process of real property assessment and the visualizing an inventory of land records.

A parcel data layer serves as a gateway to legal instruments (land records). While its accuracy is not survey grade (the parcels in the layer are graphical representations of land records), it can link to deed book references and assessment databases.

A parcel data layer can also be linked to other systems. Each parcel of a parcel data layer typically has an assigned unique parcel ID within its underlying table of attributes. This allows parcels of a parcel data layer to be linked to other systems, such as a utility billing system, a real estate assessment database, or a re-zoning application.

Imagery Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

BACKGROUND



The status of parcel data varies greatly among Vermont's communities. Parcel mapping is limited to paper format in some communities. Although digital parcel data does exist for several Vermont communities, the data of is ten to twenty years old in many areas.

Vermont's Enterprise GIS Consortium (EGC) and stakeholders of parcel information have formed a Parcel Workgroup to address the gap between Vermont's current parcel data assets and a statewide, consistent, up-to-date, parcel data layer that would be suitable to the uses of governments, businesses, and individuals.

The Parcel Workgroup's vision statement is *"Coordinating state stakeholders and resources to develop a state supported program in order to ensure the creation of municipal parcel data that meets the VT GIS Parcel Data Standard, is up to date, and will be updated regularly in the future."*

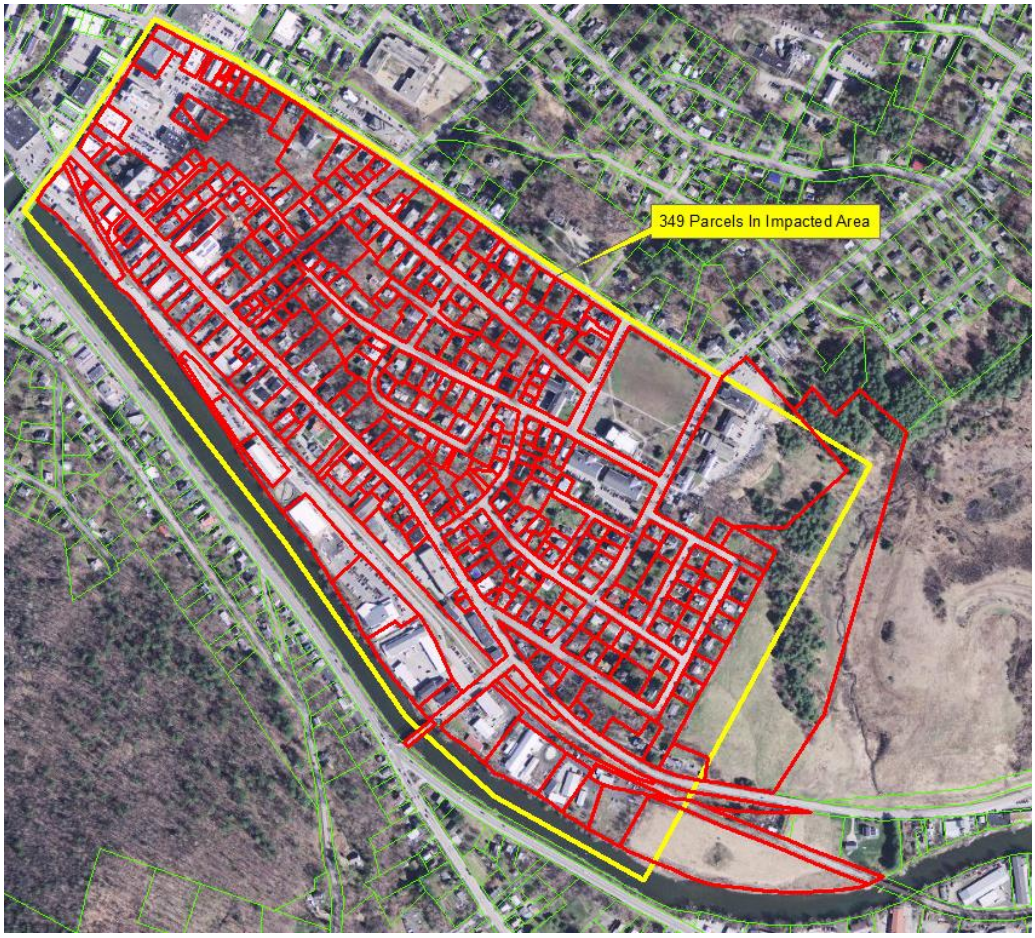
BENEFITS FROM A STATEWIDE, CONSISTENT, AND CURRENT PARCEL DATA LAYER

Emergency Management

Situational Awareness and Needs Assessment

Situational awareness is an important component to the functions of emergency management. A statewide high-quality parcel data layer can foster visualization of a situation that would otherwise not be available. For example, GIS software allows a delineation to be made for executing a spatial query on a parcel data layer to obtain an instant count of parcels that are within an impacted area.

The parcel count can be used to estimate the number of real properties (households and business properties) within a defined area. While decennial census data does provide population counts per census block, the population counts are limited to census block polygons. The area that is impacted from an emergency situation might be partially within two or more census blocks. A parcel count can add great insight on the scope of a disaster and support the calculation of quantities of resources that are needed for providing help to victims.

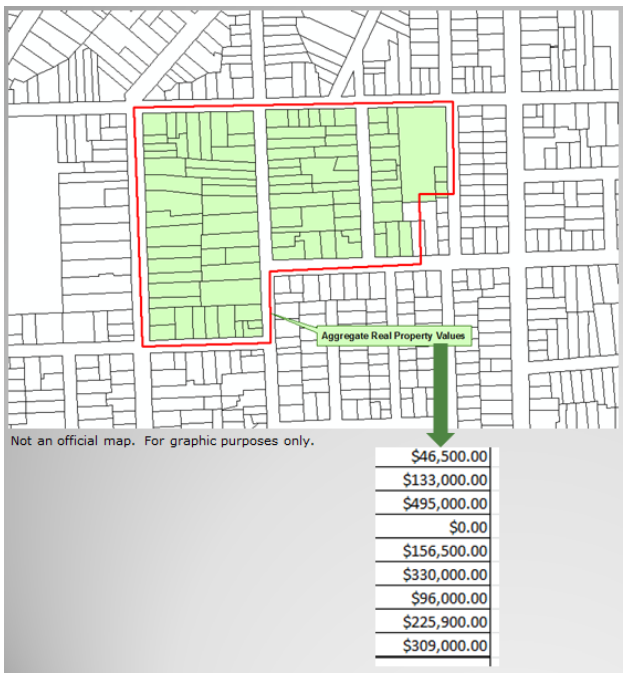


A parcel data layer can be a valuable resource before an expected event. It can assist the process of determining whether or not an emergency declaration should be requested. An emergency declaration provides federal supplementation to state and local efforts toward protecting public assets.[1]

A rapid needs assessment is conducted to determine the enormity of a disaster. One of the inputs to the needs assessment process can be the number of homes and businesses that are not insured or are underinsured. Parcel information for the impacted area supports the process of gathering that type of input, which will support a potential request for a presidential disaster declaration.[2] A presidential disaster declaration has potential for provision of federal assistance to state government, local governments, and/or non-profits for rebuilding or replacing infrastructure; A presidential disaster declaration also has potential assistance for families and individuals.[1]

Damage Assessment

When a disaster occurs, a preliminary damage assessment includes estimated amounts of damage to homes and businesses as part of a description of overall impact and severity. A parcel data layer can be a very valuable asset to the damage assessment process. First of all, in order to accurately assess damages to homes and businesses, the parcels on which those homes and businesses exist need to be identified. Second, not only does a parcel data layer "map" the parcels of a given area, but, when linked to an assessment database, it can provide an instant calculation of aggregate real property value within a defined area.

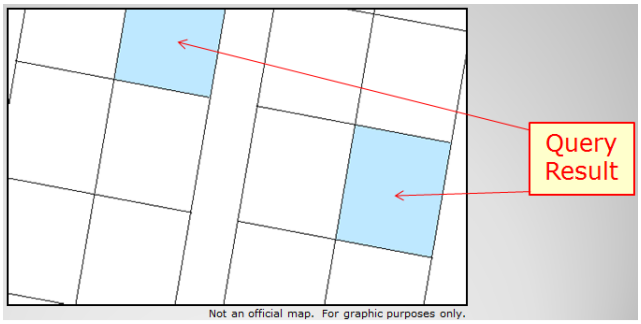


This type of dollar calculation does not have to be "all or nothing". Losses can be calculated as a percent of value for each identified parcel or each parcel's improvements (assets such as buildings and fixtures). Those losses can be captured in the parcel data layer's attribute table and then calculated to a total amount. The process is similar to the process of totaling the values of a particular column in a spreadsheet.

A parcel data layer can significantly contribute to the calculation of an accurate damage assessment, which supports a potential request for a presidential disaster declaration.[2] Nationally, presidential disaster declarations have resulted in $140 billion in assistance. More than one disaster declaration has occurred per week over the last decade.[1]

Site Selection

Sometimes recovery from a disaster requires identification of locations for carrying out certain operations, such as points of distribution or debris processing centers. For example, vacant lots or locations might be needed for collecting and mulching massive amounts of tree debris from rights-of-way. This will foster the need to quickly identify government-owned land.



While ownership and boundary information is not always conspicuous when driving through an area, a parcel data layer, when linked to land record information, can be used to quickly identify parcels which are owned by a particular owner, such as the state or a city. The process of identifying government-owned parcels can be conducted quickly through a database query.

Grant Applications

Some grant programs require certain cartographic products with applications. A parcel data layer can provide content, sometimes required content, to those cartographic products. Grants sometimes fund mitigation measures and reduce the loss of life and property due to disasters.[3]

Fire Safety

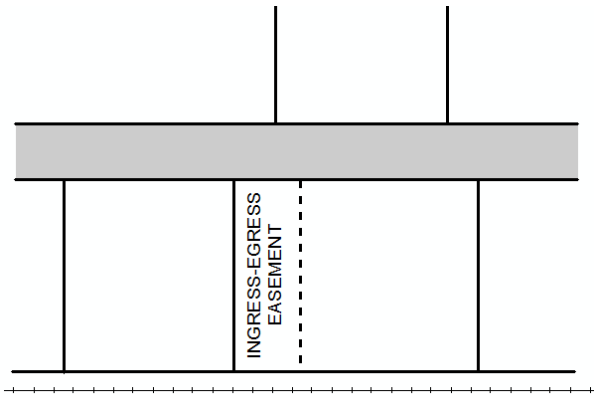
Retrieval of Land Ownership Information

Property lines and the ownership of a particular location are not always easily identified when working in the field without additional information resources. Parcel ownership information is needed at times in fire-fighting and HAZMAT operations. For example, a fire marshal might need the owner name and owner mailing address of a particular vacant parcel on which a fire has occurred. A parcel data layer is a cursory parcel information resource and a gateway to detailed parcel information, such as the legal instrument which created the parcel (for example, a deed or a subdivision plat) and the owner on record.

More than 50% of HAZMAT calls in Vermont are calls to crystal methamphetamine (meth) labs. Often, among the first questions that need to be answered when responding to a call to a meth lab is "*What is the ownership of this land?*" Meth labs are frequently located deep within wooded areas; The boundaries and ownership of the parcels on which they are located are not always easily identified deep within a property. However, a parcel data layer can instantly provide parcel boundary and ownership information.

Access Planning

Parcel information, and related information such as ingress-egress easements, can be critical to the timely identification of access options to some disasters. For example, a train derailment involving HAZMAT might occur in a wooded area behind a subdivision. A parcel data layer can provide reference to the detailed legal description documents (plats) of parcels in the area; This supports the identification of first responder access options, such as an ingress-egress easement, which are not conspicuous in the field.



A parcel data layer also provides supportive information to forest fire missions. For example, planning access and staging areas for a forest fire that is occurring deep within a forest might be supported by identification of the parcels that must be traversed between a public highway and the fire location. Identification of those parcels in a parcel data layer can provide access to related information such as the owners of the parcels.

Law Enforcement

A parcel data layer can support police investigations. For example, a complaint on activity that is occurring on the wooded portion of a particular homeowner's parcel might have been made under the assumption that the given homeowner owns the location on which the activity is occurring and that the homeowner is permitting the activity. A parcel data layer provides an overlay of information which is not always visible in the field. A parcel data layer can be quickly superimposed to aerial imagery to identify the parcel on which the alleged activity is occurring. The activity might actually be found to be occurring on a separate parcel, or within a right-of-way that is yet to be developed (paper street).

In some situations, such as a protest that is occurring along a public street or area, a parcel data layer can provide access to the land record information needed for officers to identify the boundaries between the public right-of-way, public parcels, and private parcels. A parcel data layer can also be used to identify if a street which appears to be public is actually a private street within a private parcel.

A parcel data layer can be utilized in crime analysis, assembly of intelligence, and complex investigations. In one case the locations of rapes with a particular MO were located in a particular area of a city. Then, the rapes stopped occurring in that area and rapes with the same MO started occurring in another area of that same city. Parcels were selected from the parcel data layer in the two areas and those selected parcels were linked to utility billing information. Common utility billing names were identified in both areas. This led to an arrest.

E911

The new generation of E911 systems include geospatial capabilities. These modern systems typically include a digital mapping component that allows dispatchers to geographically visualize the location of a call and the locations of emergency response assets (police beat boundaries, real-time emergency vehicle locations, etc.). The call's location is superimposed to a digital map that includes layers of reference information, such as aerial imagery and street names.

A parcel data layer can serve as an additional layer in an E911 mapping component for provision of parcel information that can be helpful to first responders. For example, a dispatcher can visual the parcel data layer as it is superimposed to aerial imagery in order to advise responders of the various access points to a particular property.

REFERENCES

1. *FEMA's Disaster Declaration Process: A Primer*, Francis X. McCarthy, May 18, 2011, Congressional Research Service, http://www.fas.org/sgp/crs/homesec/RL34146.pdf

2. *State Disaster Management Course—IS 208.a*, http://training.fema.gov/emiweb/IS/IS208A/05_SDM_Unit_04_508.pdf, accessed on January 17, 2014

3. *FEMA, Hazard Mitigation Grant Program*, http://www.fema.gov/hazard-mitigation-grant-program, accessed on January 17, 2014