

Making and Sharing Digital Community Asset Maps Using Free Software and Web Resources

A Guide for Community Groups

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Introduction

This document is prepared to support community groups that are mapping community assets and wish to have the mapped information captured in digital formats so that it can be easily shared and updated. Sharing of the map information can occur through email and the World Wide Web. Updating the digital information periodically keeps the information current with little incremental cost. Regular updating can also provide a sequence of historical “snapshots” showing how community assets change over time within the community.

There are excellent websites that inform why the processes and products of community asset mapping are valuable to community development and how to undertake the development of community asset maps. An internet search for “community asset mapping” will result in the identification of a number of resources. A good example is:

Canadian Rural Partnership Asset Mapping: A Handbook

http://www.rural.gc.ca/conference/documents/mapping_e.phtml#1

Another excellent source of food security information is the Bits and Bytes website at www.bitsandbytes.ca. By putting “mapping” into the search engine, a number of resources associated with food system mapping are available.

Often these resources provide direction in the development of a single copy of a paper map. There are benefits of having community maps in digital form as well. These benefits include:

- *Assets maps can be easily duplicated and shared with organizations, groups and individuals using the internet and they can be used in free popular programs such as Google Earth and Google Maps.*
- *Assets maps can be shared in file formats that are used by Geographical Information Systems (GIS). Local Governments, planning consultants, First Nation governments and government agencies can incorporate the asset mapping information into map products that support policy development processes*
- *Assets maps can be incorporated into online web atlases which allow the community assets to be displayed in conjunction with other mapped information available online from local governments and other agencies*

This document provides you with the tools to realize these benefits using easily available software that does not require computer expertise beyond that of most computer users. The methodology consists of five steps. Once data is converted into digital mapping file formats in Step 3, a number of options are available to the user for making and sharing community asset maps and data.

This document provides direction to the use of two software programs (Excel, Google Earth) as well as the BatchGeocode.com and GeoCommons.com websites. Each of these resources has far more functionality than that described in this guide. These tools can be used for much more than the development of digital maps showing the point locations of community assets. Users are encouraged to explore tutorials, websites and forums associated with these programs and websites to identify the opportunities for making more sophisticated maps and sharing these products in more effective ways using these resources. Look at this document as a basic guide to introduce how simple maps can be easily and cheaply made. Learning these skills and making these maps can be an introductory step to building greater capacity at the community level in digital mapping and information management.

What are community assets?



The Asset Mapping Handbook prepared by the Canadian Rural Partnership has a good definition of community assets reflected in the following diagram. This concept of community assets need not apply to rural areas only – it is applicable to urban areas as well. Community assets are defined as popularly recognized attributes and advantages of a specific community. They are considered essential for the maintenance of communities and vital for the sustainability of the economy, society and environment.

Community assets can be grouped into five categories, which with examples, are shown in the table below:

Categories of Community Assets	Examples
natural	Streams, beaches, wildlife trees, viewpoints, parks
built	Grocery stores, pharmacies, bicycle paths, playgrounds, fibre optic lines, places of worship, libraries
social	Location of Girl Guide meetings, quilting groups, cribbage clubs
economic	Major employers, lending agencies, economic development agencies, wood lot, farmers' market
cultural	Public art, architecture, points of interest, galleries
service	Schools, hospitals, doctors' offices, Post Office

Scanning over the examples above, these various assets can be shown on a map as a point (Post Office, wildlife tree), a line (fibre optic cable, bicycle path) or shape/polygon (wood lot, park). This guide provides information on creating digital maps of assets using points only. With the addition of a Global Positioning System (GPS) lines and polygons can be incorporated into digital asset maps using the same software discussed in this guide. Instructions to incorporate lines and polygons are outside the scope of this guide but are available on websites and forums associated with Google Earth.

Overview of the Digital Mapping Process

The following diagram (Figure 1) illustrates the various phases of the digital mapping process described in this guide. Software and website names written in blue are free, are relatively easy to use, and have well documented "help" for users.

Figure 1: Mapping Community Assets using Free Software and Web Resources
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Prepared
 March, 2009

1. Getting Started

Develop Data Entry Template (using MS Excel or [Open Office](#))

2. Collecting Data in Spreadsheet

Enter data into template on each specific asset in a consistent manner. Spreadsheet in csv format

2B - Use [Google Earth](#) to determine Latitude and Longitude of assets without street addressess

2A - Use [Batchgeocode.com](#) to georeference street addresses

3. Convert spreadsheet to SHP files and KML files

Use [Batchgeocode.com](#) to convert to KML file format

Use [GeoCommons](#) website to upload and convert spreadsheet to shp files and kml files

4. Make maps

Use shp file in [ArcExplorer](#), a simple GIS viewer

Use shp file in [Quantum GIS](#), an open source GIS application

Use [GeoCommons "Mapper"](#) to make maps using your data

5. Sharing the Files and Maps

Distribute map products to various communities of practice

Distribute shape files via web and email to policy developing agencies that have GIS departments

Engage contractor to use shape files to create local web atlas within Community Mapping Network

Distribute KML files to Google Earth users in various communities of practice

Phase 1 – getting started

Two types of information are critical to produce useful maps of community assets - the geographic location of the asset and the characteristics, or attributes, of the asset. The geographic location is captured by using either the street address of the asset or by using its geographic coordinates (the latitude and longitude). The attribute information is classified into various categories and entered into associated columns in a spreadsheet.

Give some thought at the beginning of your project regarding the community assets you wish to map. Create a spreadsheet for each major type of assets.. For example, if your project involves mapping assets associated with community food security, create separate data entry spreadsheets for grocery stores, fast-food restaurants and community gardens. Think about the information (or attributes) of each asset that you wish to capture and how this information should be categorized. If this information is organized in an efficient and consistent manner in your spreadsheet, it can be used later in the project to make specialized maps in geographical information systems if it is collected and recorded in a consistent manner in the spreadsheet. This information can also be shown when the asset is displayed in Google Earth. The url for websites and photos can be included in the columns of attribute data.

Phase 2 – Collecting and Entering data

Entering attribute data into the spreadsheet

A critical decision that needs to be made initially in data collection is how location information is to be entered into the spreadsheet. It is the location information (latitude and longitude) that is used by the websites in the next phase to convert the assets in your spreadsheets into dots on a computer map.

In urban areas, community assets often have street addresses. Street addresses can be quickly converted to latitude and longitude using a free web tool called Batchgeocode.com to add latitude and longitude columns to your spreadsheet. The Batchgeocode.com website can convert street addresses from Canada, USA and some European countries into points with a specific latitude and longitude – a process referred to as geocoding. This task is shown as Phase 2A in Figure 1. Where street addresses are not available (such as rural areas or in countries where online geocoding is not supported) Google Earth is used to identify the latitude and longitude of each asset to be manually entered into the spreadsheet. This task is shown as Phase 2B in Figure 1.

2A - Geocoding Street addresses (urban areas)

The example below shows location and attribute information captured for schools in Kamloops BC. Because Kamloops is an urban area, these particular community assets have street addresses found in the telephone book and on the web. Notice that the first column is Name, followed by the street address, City and Province, followed by some categories that classify the attribute information associated with the school asset. Make sure there is consistency in how you enter the data – avoid entering unnecessary spaces and use upper and lower case consistently.

	A	B	C	D	E	F	G
1	Name	Address	City	Province	Type	Public/Private	Grades
2	A E Perry	1380 Sherbrooke Ave	Kamloops	BC	Elementary	Public	K-7
3	Aberdeen	2191 Van Horne Dr	Kamloops	BC	Elementary	Public	K-7
4	Norkam	730 12 St.	Kamloops	BC	Secondary	Public	8-12
5	Sahali	255 Arrowstone Dr	Kamloops	BC	Secondary	Public	8-12
6	St. Ann's Academy	205 Columbia St	Kamloops	BC	Elem - Sec	Private	K-12
7	Dufferin	1880 Hillside Dr	Kamloops	BC	Elementary	Public	K-7
8	Arthur Hatton	1315 Chestnut Ave	Kamloops	BC	Elementary	Public	K-7
9	Lloyd George	830 Pine St	Kamloops	BC	Elementary	Public	K-7
10	Kay Bingham	950 Southill St	Kamloops	BC	Elementary	Public	K-7
11	Brocklehurst	985 Windbreak St	Kamloops	BC	Secondary	Public	8-12
12	OLPH	235 Poplar St	Kamloops	BC	Elementary	Private	K-7

Figure 2 Spreadsheet prior to Geocoding using BatchGeoCode.com

Both the geographic location and the attributes of the asset are captured in a spreadsheet in tab delimited (txt) or CSV (comma separated values) format. Microsoft Excel is a common commercial software product that allows files to be saved in these formats. Older versions of MS Excel can be used for this purpose as can Calc, the spreadsheet program within Open Office, available as a free download from <http://openoffice.org-2009.com/index.asp>.

In the next phase, your completed spreadsheet is uploaded to a website and georeferenced by adding a latitude and longitude column to your spreadsheet. Saving in tab delimited format is important, as is having the name in the first column (cell A1 in the example above) and the street address labelled "address" (cell B1 in the example above).

The Kamloops schools spreadsheet example (Figure 2) shows how the address needs to be entered into the spreadsheet that it will allow it to be geocoded by BatchGeoCode.com. Notice how the address is comprised of the number and street in one field, and city and province in separate fields and without commas. The column is labelled "address". In the Kamloops schools example, this information was obtained from the phone book.

	A	B	C	D	E	F	G	H	I
1	Name	Address	City	Province	Type	Public/Private	Grades	bg_lat	bg_long
2	A E Perry	1380 Sherbrooke	Kamloops	BC	Elementary	Public	K-7	50.704452	-120.375852
3	Aberdeen	2191 Van Horne	Kamloops	BC	Elementary	Public	K-7	50.640923	-120.359314
4	Norkam	730 12 St.	Kamloops	BC	Secondary	Public	8-12	50.699624	-120.372544
5	Sahali	255 Arrowstone	Kamloops	BC	Secondary	Public	8-12	50.665316	-120.34538
6	St. Ann's Academ	205 Columbia St	Kamloops	BC	Elem - Sec	Private	K-12	50.671293	-120.336513
7	Dufferin	1880 Hillside Dr	Kamloops	BC	Elementary	Public	K-7	50.66331	-120.407165
8	Arthur Hatton	1315 Chestnut Av	Kamloops	BC	Elementary	Public	K-7	50.69477	-120.350659
9	Lloyd George	830 Pine St	Kamloops	BC	Elementary	Public	K-7	50.669802	-120.320687
10	Kay Bingham	950 Southill St	Kamloops	BC	Elementary	Public	K-7	50.703716	-120.397944
11	Brocklehurst	985 Windbreak S	Kamloops	BC	Secondary	Public	8-12	50.705208	-120.404097
12	OLPH	235 Poplar St	Kamloops	BC	Elementary	Private	K-7	50.694658	-120.361981

Figure 3 Spreadsheet after geocoding using BatchCode.com

Figure 3 shows the Kamloops schools example after BatchGeoCode.com has geocoded the addresses of the community assets. The information highlighted in red has been added to the original spreadsheet. This information consists of the latitude and longitude of each address shown in decimal degrees. Note that longitudes in the Western Hemisphere are prefixed with a "-" sign (as are latitudes in the Southern hemisphere).

The following images show some of the steps when using the BatchGeocode.com website to geocode the addresses and add them to your spreadsheet. The BatchGeocode.com website requires no user ID or “logon”.

The following image shows the Kamloops Schools spreadsheet data copied from the spreadsheet and pasted into the window within the website.

Map Multiple Locations / Find Address Coordinates

[Ads by Google](#) [Geo Map](#) [Batch Convert](#) [Batch Tiff Conversion](#) [Geocode](#)

Locate multiple addresses internationally - North America & Europe - calculate distances - make your own mashup map - instantly.
 Take any kind of street address list, for example copied from *Excel*, and geocode the addresses to get latitude and longitude coordinates using the tool below. The data can then be mapped in your browser, downloaded into *Google Earth*, saved to a web page, or transferred back into your spreadsheet. You can also use this tool to calculate distances to multiple addresses from a single point, or get quick driving directions to multiple destinations. Mapping multiple locations with your own custom data takes seconds, just follow the 6 steps below to plot your own data on a fully interactive multi-point map. It's fast, easy, and - **free to use!**

Step #1 -----
 Start by putting your data in a compatible delimited format
 (tab-delimited is easier for copying from an external source, bar-delimited should be used for hand entry):
 Tab Delimited ([Download Excel Map Template](#)) Bar ("|") Delimited

Step #2 -----
 Copy/paste addresses into the table below, or try it out with the example data provided:
 (if you only have one address, you can use our [Single Address Lookup Tool](#))

Name	Address	City	Province	Type	Public/Private	Grades
A F Perry	1980 Sherbrooke Ave	Kamloops	BC	Elementary	Public	K-7
Aberdeen	2191 Van Horne Dr	Kamloops	BC	Elementary	Public	K-7
Norkam	730 12 St.	Kamloops	BC	Secondary	Public	8-12
Sahali	255 Arrowstone Dr	Kamloops	BC	Secondary	Public	8-12
St. Ann's Academy	205 Columbia St	Kamloops	BC	Elem - Sec	Private	K-12
Dufferin	1880 Hillside Dr	Kamloops	BC	Elementary	Public	K-7
Arthur Hatton	1315 Chestnut Ave	Kamloops	BC	Elementary	Public	K-7
Lloyd George	830 Pine St	Kamloops	BC	Elementary	Public	K-7
Kay Bingham	950 Southhill St	Kamloops	BC	Elementary	Public	K-7
Brooklehurst	985 Windbreak St	Kamloops	BC	Secondary	Public	8-12
OLPH	235 Poplar St	Kamloops	BC	Elementary	Private	K-7

(example file will load automatically upon selecting a format, click here to [turn off example loading.](#))

Step #3 -----
 Click "Validate Source" to ensure data format is readable and populate column data:
 Done: 7 columns, 11 rows

Once the source has been validated (Step #3) and the Geocoder run (Step #4), the asset data is displayed, together with the latitude and longitude (see image below). The geocoded data is then highlighted and copied to the clipboard, then pasted back into your spreadsheet program. Make sure your new geocoded spreadsheet is in CSV format.

Step #4 -----

Select appropriate columns from the drop-downs below. Use address/city/state for exact map, or city/state or zip can be used for regional map:

Location Fields

Address

City

State / Province or Country (Europe)

Zip / Postal Code

Map Fields (not required)

Title

Description

Group By

URL

Image URL

(Note: URLs and Image URLs should start with "http://" or they will not work properly.)

Map Options

Calculate (straight line) distance from first address in

Show field names in map description (when using "All Remaining Fields" option)

Select a default map view to show

Step #5 -----

Click "Run Geocoder" and wait for geocoding to finish:

Geocoded: 11/11 records.

Step #6 -----

Geocoding results are below, you can copy/paste this back into a spreadsheet or import into a database. Right click on the form below and click "Select All", then right click again and click "Copy." Formatting is maintained but 2 columns containing coordinates are added: *bg_lat* (latitude), *bg_long* (longitude):

Province	Type	Public/Private	Grades	bg_lat	bg_long	
erbrooke Ave	Kamloops	BC	Elementary	Public	K-7 50.704452 -120.375852	
n Horne Dr	Kamloops	BC	Elementary	Public	K-7 50.640923 -120.359314	
Kamloops	BC	Secondary	Public	8-12	50.699624 -120.372544	
Dr	Kamloops	BC	Secondary	Public	8-12	50.665316 -120.34538
205 Columbia St	Kamloops	BC	Elem - Sec	Private	K-12	50.671293 -120.336513
llside Dr	Kamloops	BC	Elementary	Public	K-7	50.66331 -120.407165
estnut Ave	Kamloops	BC	Elementary	Public	K-7	50.69477 -120.350659
e St	Kamloops	BC	Elementary	Public	K-7	50.669802 -120.320687
thill St	Kamloops	BC	Elementary	Public	K-7	50.703716 -120.397944
dbreak St	Kamloops	BC	Secondary	Public	8-12	50.705208 -120.404097
Kamloops	BC	Elementary	Private	K-7	50.624658 -120.361981	

BatchGeocode.com is a free web utility supported by donations. This website is extremely useful for low cost community asset mapping. Users are encouraged to make a financial donation to support the service through the website.

The BatchGeocode.com website can also convert your geocoded spreadsheet into a Google (KML) file which can be displayed in both Google Earth and Google Maps. The image below shows the Kamloops Schools data displayed in Google Maps before the "Download to Google Earth (KML)File" button is pressed. Once pressed, a KML file is created and downloaded. Double click the file to open it in Google Earth (assuming it is already installed) and your community assets will be displayed.

BatchGeocode also will create a free webpage of your map, together with a list of your community assets. The url for this webpage can be placed on a website, blog or email.

dbreak St	Kamloops	BC	Secondary	Public	8-12	50.705208	-120.404097
Kamloops	Kamloops	BC	Elementary	Private	K-7	50.694658	-120.361981

You're done! Now that you have coordinates for your data, want to see your results on a map? Below is a map of the geocoded results. Click on each point to get the information from that record.

More Mapping Options

Now that you've geocoded your custom address data, want to display it on your own web page? or download it into Google Earth?:

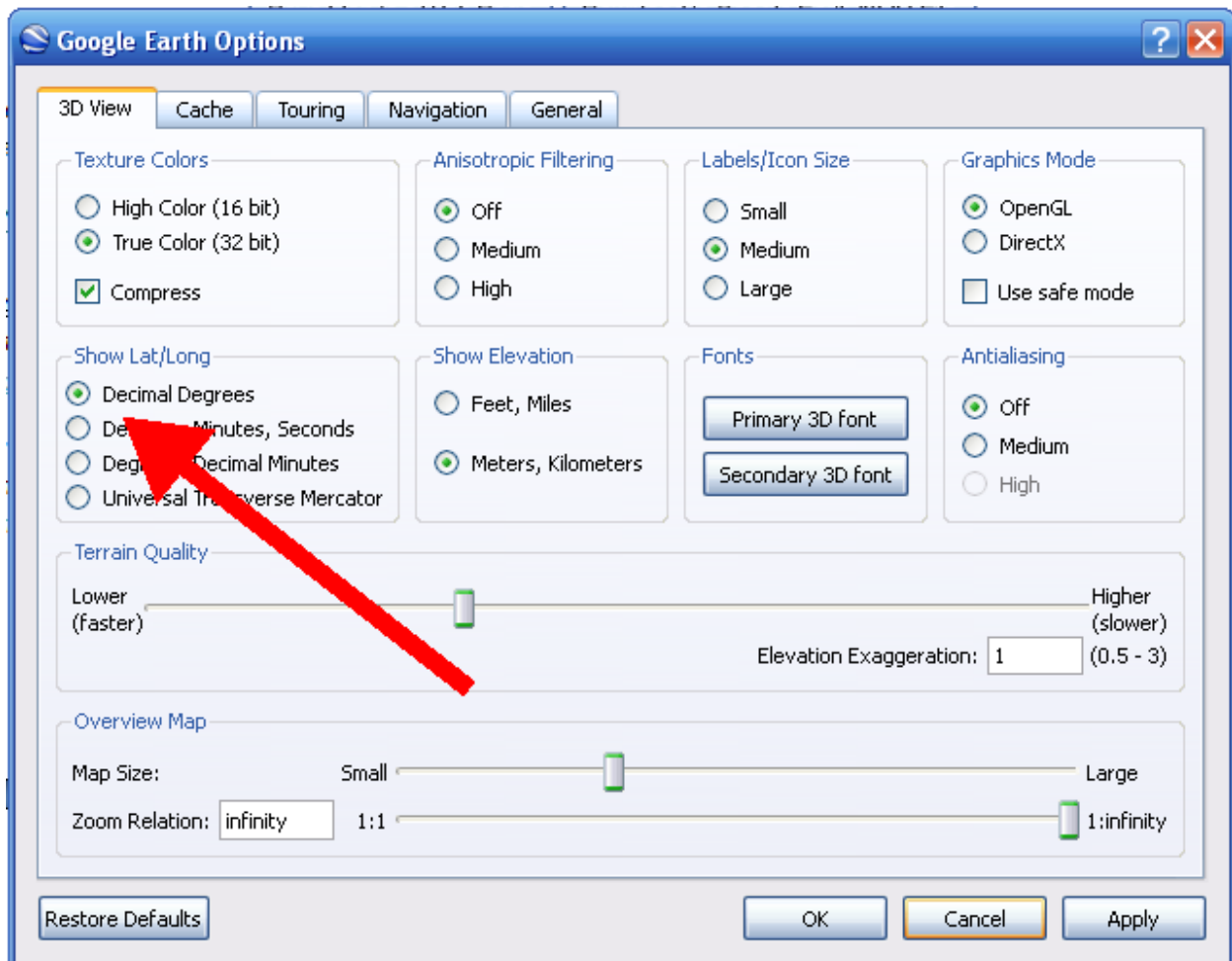
*Congratulations! You have created a community asset map which can be easily shared via websites and email. To save this geocoded information as a digital file within Google Earth, **right click** on the name of the file, **select** "save place as", and save as a kml file. (kmz is a compressed version of kml). Be sure to give the file a more unique name than the default BatchGeocode.kml.*

At this stage, this may be as far as you wish to go regarding the mapping of community assets. Your KML file can be distributed via email or through a website (Phase 5 in Figure 1). These files can be useful to groups or individuals acting as advocates or support decision making by individuals, businesses and community organizations.

2B - Entering geographic coordinates manually using Google Earth

For rural areas and for community assets without a street address, geographic coordinates (latitude and longitude) must be entered individually into the spreadsheet. Google Earth can be used to determine the precise latitude and longitude for any point on the planet. Google Earth is a free download that can be obtained at <http://earth.google.com/>.

It is important that latitude and longitude be entered into the spreadsheet as decimal degrees. To change the format of latitude and longitude to decimal degrees within Google Earth, select from the Menu Bar "Tools" > Options > 3D View and then select the radial button "decimal degrees" as shown in the following image.



When Google Earth is active, the geographic position of the “hand” that you move around the computer screen is indicated in the bottom center of the display. The image below was captured from Google Earth where the “hand” was placed over a building. The geographic coordinates of the building are indicated as latitude of 50.713088 degrees and longitude of -120.446511 degrees.

	Entering Geographic Coordinates in your Spreadsheet	
	<i>Latitude</i>	<i>Longitude</i>
	50.713088	-120.446511

The example below shows community asset information associated with some golf courses in Kamloops BC. The geographic coordinates (latitude and longitude), obtained from Google Earth, indicate the location of the clubhouse of each golf course.

	A	B	C	D	E	F
1	Name	latitude	longitude	length	holes	par
2	Kamloops Golf and Country Club	50.712781	-120.446611	full	18	72
3	McArthur Island GolfPlex	50.696256	-120.381325	executive	9	32
4	Mt. Paul	50.688306	-120.321741	executive	9	32
5	The Dunes	50.780152	-120.330528	full	18	72
6	Aberdeen Hills	50.641045	-120.373699	full	9	36
7	Pineridge	50.668598	-120.189998	executive	18	72

This data is in the correct format to allow GeoCommons.com, the next tool we will use in our asset mapping process, to convert the spreadsheet into Google Earth (KML) and other map formats. Again, the first column in the spreadsheet is “Name”. Put latitude and longitude in the second and third columns respectively. Don’t forget the “-” sign for the longitude if you are in the Western Hemisphere.

Phase 3 – converting your CSV spreadsheet to KML and SHP (“shape”) format

The BatchGeocode.Com website used in Phase 2A allows the conversion of the spreadsheet in CSV format to be converted to KML format. For CSV spreadsheets in Phase 2B (without geocoding), and for the conversion of CSV spreadsheets to SHP format (or “shape” files), it is recommended to use an excellent web resource GeoCommons.com. This free website allows one to upload and convert between three file formats – CSV

spreadsheets, KML (Google Earth) and SHP ("shape" files). This web resource is also a mechanism for sharing your digital files, and making maps using online tools.

This resource can be found at www.geocommons.com

The screenshot shows the GeoCommons website interface. At the top, there's a navigation bar with 'Finder!' and 'Maker!' buttons. Below that is the 'geocommons' logo. The main content area has a heading 'Are you taking advantage of your location-based data?' followed by a brief description of the service. To the right, a 'Get Started' sidebar lists three options: 'Create a Map with Maker!', 'Explore GeoData with Finder!', and 'Explore Current Events with Map of the News'. Below the main heading, there are two large boxes: 'Maker!' and 'Finder!'. The 'Maker!' box highlights 'Actionable Maps in Minutes' and 'Bust the Content Ceiling'. The 'Finder!' box highlights 'Quickly find data you need with easy search tools' and 'Common Formats'. On the right side, there's a 'Stay in the Loop' section with an email sign-up form and a 'Latest Tweet' section featuring a tweet from @dgcohen23. At the bottom right, there's a 'Latest Posts from our blog' section with a post titled 'Dataset of the Day: Measuring Leisure in the OECD'.

Why convert to "shape" format?

Google Earth is a fantastic program for developing community asset maps, visualizing them at different scales, and sharing the product with potentially millions of users. There are other types of computer mapping programs that have functionality that Google Earth does not have which can be very useful communication and information tools. These tools are Geographical Information Systems (GIS) and web atlases.

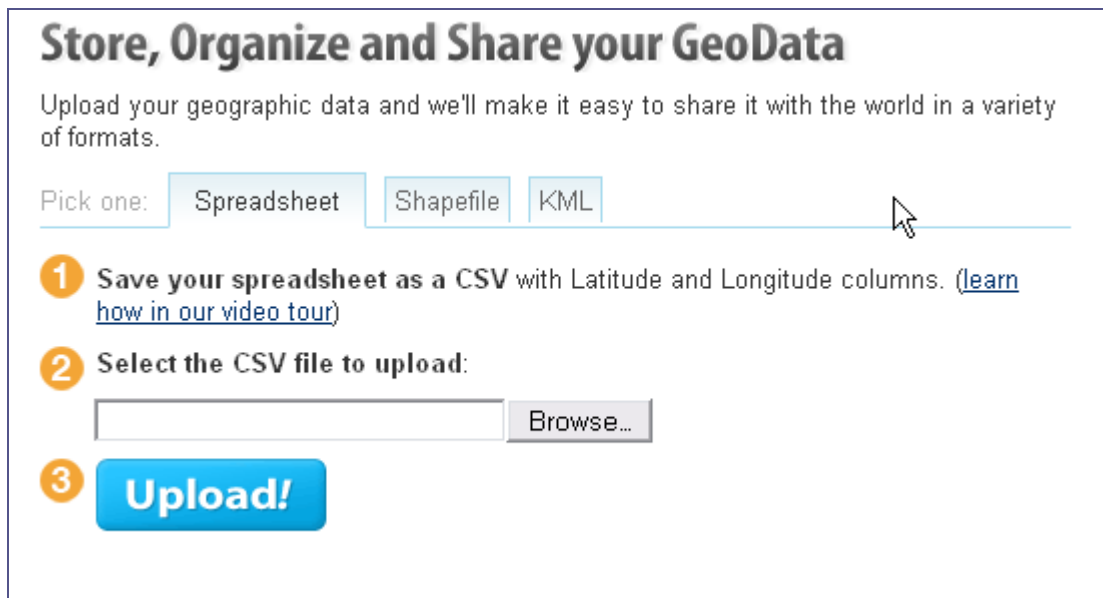
Geographical Information Systems are used by government agencies to support decision making and policy development. Digital map information of a number of different types can be queried, analyzed, and displayed in a myriad of combinations allowing for specific map products to be prepared. Politicians make government policy based on recommendations from their staff. Often agencies' staffs use GIS to help analyze issues and

recommend policy. Converting community asset maps into SHP format, and providing the files to agencies, allows the incorporation of the asset information into the policy making process in an efficient manner.

An increasing number of web atlases are appearing on the World Wide Web. These online atlases can have the functionality of a basic GIS. They allow the user to select combinations of map information for display in an internet browser. Tools in the software allow for simple queries, changing scale, preparing an attractive printed product, among others. These atlases can be built using SHP files developed locally as a building block.

How to convert a CSV spreadsheet to KML and SHP format

Once you are at the GeoCommons website, click on the blue finder button that will take you to the next page where you will find the utility below. Be sure to click on the Spreadsheet tab.

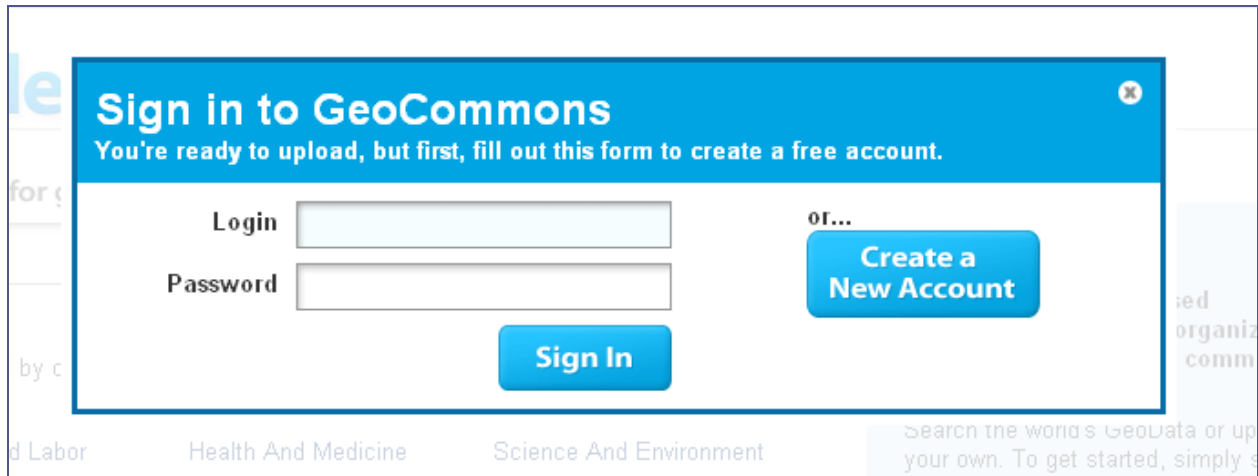


The screenshot shows a web interface titled "Store, Organize and Share your GeoData". Below the title is a sub-header: "Upload your geographic data and we'll make it easy to share it with the world in a variety of formats." There are three tabs: "Spreadsheet", "Shapefile", and "KML". The "Spreadsheet" tab is selected. Below the tabs, there are three numbered steps: 1. "Save your spreadsheet as a CSV with Latitude and Longitude columns. (learn how in our video tour)" with a link. 2. "Select the CSV file to upload:" followed by a text input field and a "Browse..." button. 3. A large blue "Upload!" button.

This utility allows for uploading and converting of three types of files, KML, spreadsheet files in CSV format, and "shape" files (a "shape" file is actually a package of a minimum of three files used by a GIS. These files have .shp, .dbf, and .shx extensions). If you wish to create a SHP file, converting directly from your CSV spreadsheet is preferable to converting a KML file.

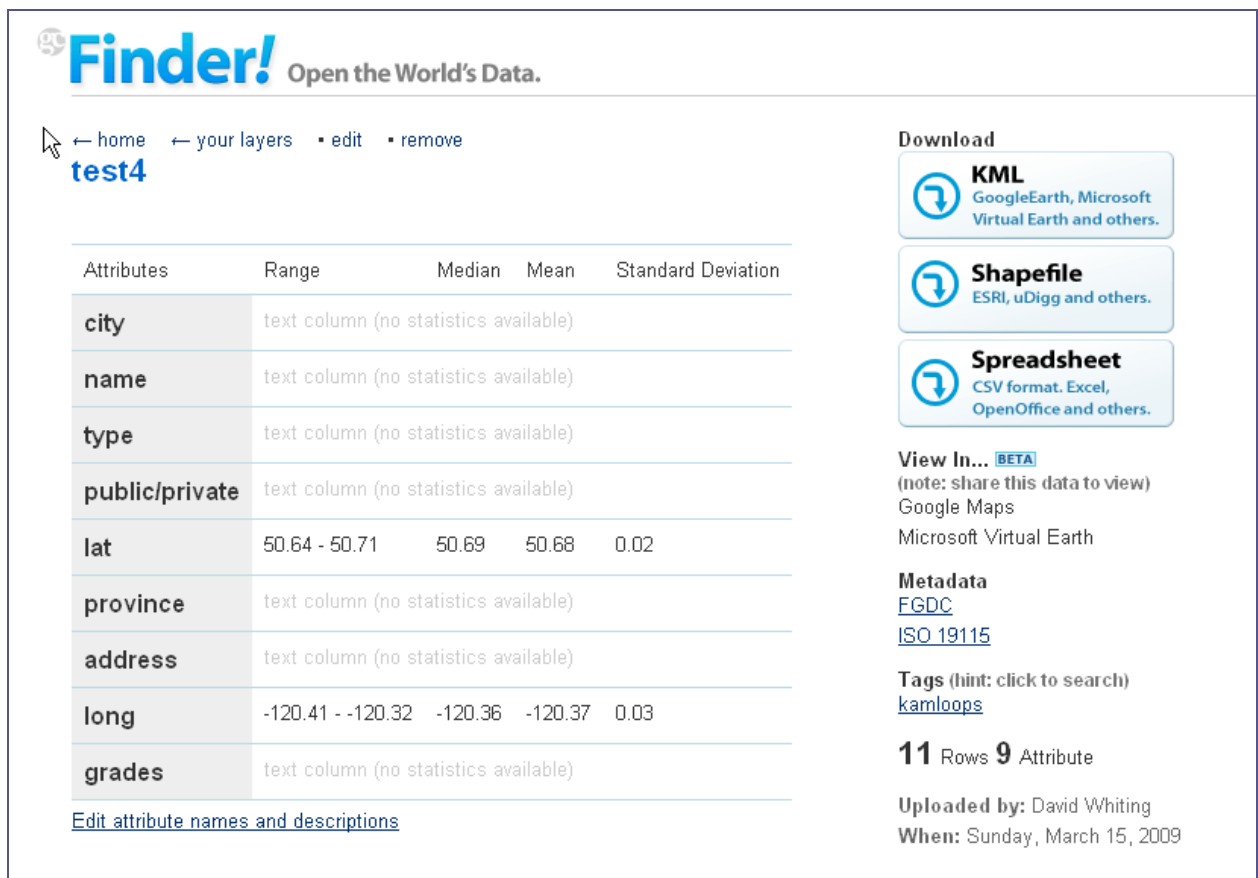
To convert your CSV file to another format, browse to the location of your CSV spreadsheet file that you wish to convert to "shape" files and/or KML files

When you then click Upload, you are asked to Sign In or create a free account.



The GeoCommons website is well designed with instructional videos, as well as a User Manual to help you use the file conversion utility. The website also fosters the sharing of geographic information with a broad community of users, and the “Maker” side of the website allows you to make maps using your uploaded data and that provided by others.

Once you have successfully uploaded the spreadsheet, entered information regarding the file, and saved it, you reach a screen shown in the image below. This is where you can convert the file into other file formats and download the file with the click of the appropriate button on the right.



Phase 4 – Making Maps

Now that your community assets are in digital mapping formats, they can be used by Google Earth and Google Maps, free programs and websites to make maps. As well as Google Earth and GeoCommons Maker, here are some mapping resources that are available for free or low cost:

<i>ArcGISExplorer</i>	<i>A free GIS viewer from ESRI, the major GIS software vendor. This program allows you to view shape files together with online imagery and data</i>	http://www.esri.com/software/arcgis/explorer/index.html
<i>Quantum GIS</i>	<i>A full open source GIS application that provides for both viewing and analysis of spatial information</i>	http://www.qgis.org/
<i>The Community Mapping Network</i>	<i>A partnership that helps local British Columbia organizations develop an online community atlas using open source software</i>	http://cmnbc.ca/