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## Introduction

Welcome to iGIS, the first true GIS for the iPhone and iPad.

Why do we claim to be the first true GIS for the iPhone/iPad?

- You can display your own data - points, lines and polygons;
- You view maps as a series of layers; and
- You can create new data and export it back to your desktop GIS.

## Getting Started

- When iGIS starts you will be presented with icons of all your projects.



- The basic steps to get started with iGIS are:

### **1. Load spatial data from Shapefiles onto your phone using Import.**

As part of the import process you must specify what coordinate system (or projection) the data is in. This is very important to ensure that all data aligns with the underlying satellite maps. If your data is in longitude/latitude coordinates, then a good default projection to use is 4326:WGS 84.

### **2. Set up a project and the layers using Project.**

This is where you define the data that you wish to appear on the map and how each layer will look. You are able to set the color and thickness of each layer to achieve the look you wish. The order of layers is important, as they are drawn on top of each other. Polygons should be drawn at the bottom, then lines with points on top. That way you should be able to see all your data on the map. You can also change the drawing order of layers in the map display.

### **3. View the map using Map.**

Viewing your data on maps is the fun part. Use all the standard touch gestures to move around the map, such as pinch zoom, double tap and double finger tap.

# Import

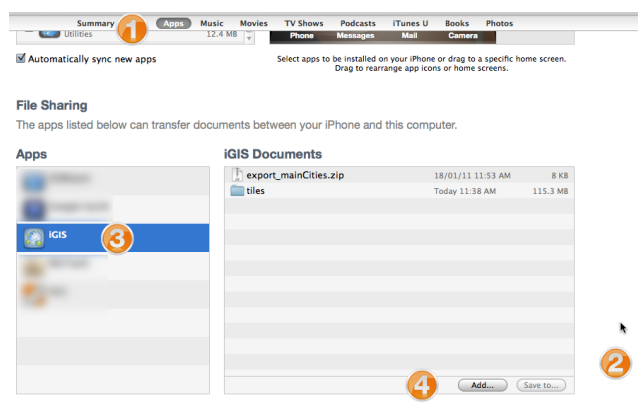
To import data into iGIS you need to connect to a computer through the iPhone USB cable or a WiFi network. Press the Import button, and choose between WiFi and USB by pressing the button at the bottom of the screen.

## Importing via USB Cable

To import via the USB cable, you will need to zip (or compress) your files, then use iTunes to transfer these files to your iPhone.



1. Zip or Compress all the files you wish to import
2. Connect your iPhone to a Mac or PC using the white Apple USB cable.
3. Start iTunes on your PC/Mac.
4. In iTunes, click on your device name under the Devices list



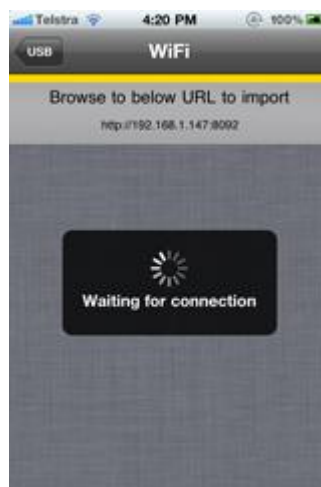
1. In iTunes, click on the 'Apps' tab
2. Scroll to the bottom of the page, to the File Sharing section
3. Choose the iGIS App

4. Add the zip file of your spatial data to the project.

The data is automatically synced to your iPhone/iPad and the load process is then initiated on the iPhone. You will need to set the projection of the data and the character set.

### Importing via WiFi

When you enter the Import mode, a Web Server will be started on the iPhone. The IP address of the device is presented on the iPhone display. Enter this address into a web browser on you desktop machine in order to start the Data Import.



If you have access to Bonjour, an Apple service discovery protocol, then the iPhone will be available to you through that interface. This removes the need to enter the IP address into a browser as Bonjour takes care of this for you.



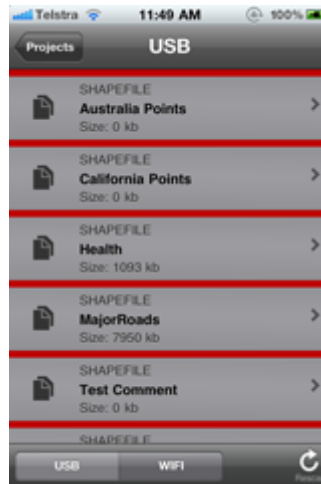
Once the web page is running, you can upload Shapefiles to the iPhone. Please consult the documentation on the Import web page for further instructions on how to import Shapefiles.

## Export

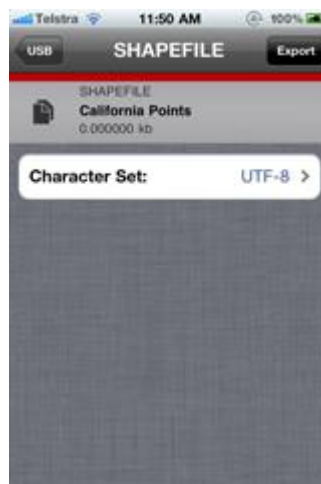
You can export iGIS spatial data either through:

- the USB cable, or
- a WiFi connected computer.

### Exporting via USB



This is the default method. Choose the files you wish to export from this list of all data.



The files will be exported to Shapefile format and zipped up.

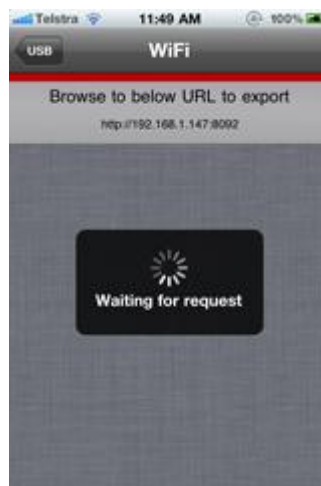
1. Connect your iPhone to a Mac or PC using the white Apple USB cable.
2. Start iTunes on your PC/Mac.
3. In iTunes, click on your device name under the Devices list
4. In iTunes, click on the 'Apps' tab
5. Scroll to the bottom of the page, to the File Sharing section

6. Choose the iGIS App
7. You will see a series of zip files, which you previously exported. Drag these to your desktop.

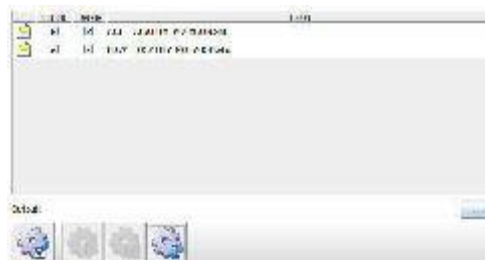


## Exporting via WiFi

You can export the spatial data stored in the iPhone through a web page designed for this purpose. When you enter the export mode the web server will be started but this time it will serve the Export web page.



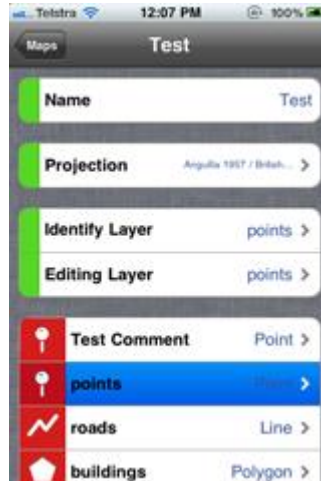
A list of available layers is presented in the Export web page. You can choose to export and/or delete any layers. Once you have set the operations you want to perform, press the start button to allow the Exporter to extract and/or remove your layers from the iPhone.



Please consult the documentation on the Export web page for further instructions on how to export Shapefiles.

## Editing a Project

The project screen allows you to edit the name, projection system and current layers for a project.



The projection system is used to specify the location at the bottom of the display when viewing the project as a map. It is not used to transform your data in order to be rendered.

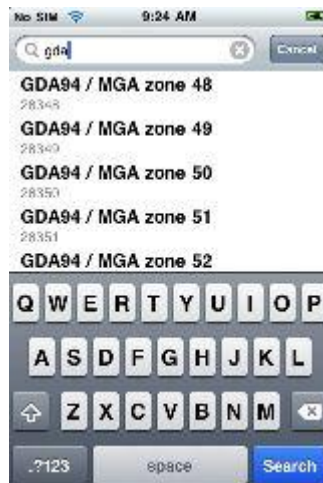
The projection system view presents a list of available Spatial Reference Systems that are supported by the application. You can scroll through the list to find the appropriate projection.



You can also enter a term into the search box at the top to search the projection list for any matches.



Any matches to the entered term will be presented to you to select the most appropriate item.



## Layers

By touching the Add New Layer button a list of layer types will be presented to you. This will contain Point, Line and Polygon depending on what types of layers you have imported in the iPhone.

If you only have point layers then only the point type will be offered to you. If you also have some polygon layers then both point and polygon will be presented.



Selecting a particular type will present all layers of that type. Scroll through the list and select the layer you want to add to the project.



Keep in mind that order of layers is very important as polygons will cover any lines or points that are beneath them. Try to keep point layers at the top of the list, followed by lines and then polygons. You can alter the order later.

When you add a layer to a project, you will be presented with some options for that layer. This includes being able to rename the layer, set a field to use for labelling, enable/disable the layer from rendering, set the style to render the layer and set an appropriate zoom level.



The style and zoom level are very important.

The style must be unique to all other layers on the same map so that you can distinguish between the different layers and see what the map is trying to tell you.



You can adjust the colour by using the sliders for Red, Green and Blue. The thickness can help differentiate more important layers from others. The alpha value allows you to make the layer transparent. This is very useful for polygon layers that cover large areas. By using a certain level of transparency, you can still see details from layers underneath it.

The zoom level becomes more important as the size or level of detail of your data increases. Changing this setting will affect when your layer becomes visible as you zoom in on the map.

At the left most setting, the layer will always be visible.

The centre setting will turn on the layer at about the state level. This is not an exact level as some states are larger than others but it gives a general idea of when to expect the layer to display.

At the right most setting the layer will only turn on when zoomed in to the street level. i.e. there is enough visible area on the map to show a few streets. Detailed data sets should be set to this level to avoid waiting for maps to render.

## Maps

When you enter the Map Viewer, you will be given a list of available projects to be viewed. Select the project by touching it in the list and a map will be displayed.



You can alter the view of the map by using gestures. Touching and then sliding your finger will pan the map around at the current zoom level. A quick flick will move further than a drag gesture.

Two quick taps will zoom in a level. Using two fingers, touch the screen and then spread your fingers apart or bring them together for a more dynamic zoom adjustment.



On the left of the toolbar at the top of the display are some buttons that allow you to set the current tool. By default it is the movement tool, which is located on the left, but you can change it to the identify tool or the comment tool. The fourth button allows you to edit the list of layers which will be discussed later.

The identify tool allows you to see the attributes for features that you select on the map. Touch the map to select features within a small area around the touch point. A circle is drawn to show you the area that will be used.

Secondly, select the layer that you want to identify features from. Then a list of features that intersect the area will be displayed. Select the feature of interest to see all attributes associated with it.

The comment tool represents a special layer within a project. When you create a project, the comment layer does not have any data in it. You can add entries into this layer that will be associated with the location that you enter them.



The centre of the map, marked by crosshairs, is the location that the comment will be linked to. When you are happy with the location, press the plus symbol in the lower right of the map to enter the comment.



The comment layer currently allows you to specify a reference, which is a small string to quickly identify the comment, and a large piece of text for the actual information you want to write.

The reference can be up to 100 characters long.

A comment can be up to 255 characters in size. While this may seem limiting, it is an unfortunate consequence of using Shapefiles.

To the right of the tool buttons is an action that allows you to alter layer settings. This will present a list of layers, showing each of their styles, with a checkbox to turn on/off each layer or to set whether the layer is the identify layer.

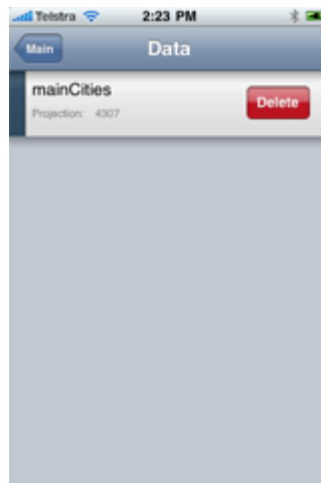


On the right side of the screen, is a control that allows you to re-order the layers in the list. Simply touch this control and drag the layer to the new position. Layers are drawn from bottom to top, so it is a good idea to place points above lines above polygons.

You are able to choose the background map that you wish to display also.

## Data

The Data section allows you to delete spatial data that you have imported into the iGIS application. It is also possible to use Export to delete data, whether you export it or not. By using the Data view, you do not need to connect to a computer in order to delete data.



To remove the spatial data just press the Delete button. This will remove the Layers associated with any Projects as well as the underlying entries in the database.



Once you delete the data there is no way to retrieve it again. You will have to import it from your original data source if you need to use it within a Project.

## Requirements

**Spatial Data** You must be able to supply spatial information, in the form of ESRI Shapefiles, which can then be imported into the application.

**WiFi for Import/Export** You will need a computer that is capable of "seeing" the iPhone on a network. Generally, this means having a WiFi connection for the phone and the required security settings to see it from a computer on the same network. As iGIS uses standard web protocols, security is not usually a problem unless your network has been locked down or if you are at a public WiFi hotspot.

**3G/WiFi for Background Imagery (optional)** While the data of interest is supplied by you, iGIS will use a background layer supplied by Google Maps.

The Google Maps data is retrieved through a network connection. This may be a WiFi connection but it also could be a 3G connection which may have a cost associated with it.

The Google Maps images are cached, but you must ensure that you download the required images at all zoom levels before you disconnect from your network.

## Deleting from Lists

A quick swipe with your finger will delete items from a list. You will have to confirm the item to delete, so there's no danger of accidental deletions.

## Speed Tips

Spatial data is often very large in terms of storage. This can happen in one of two ways or by a combination of the two. Either the data contains many individual features and/or each feature is very detailed (in the case of highly detailed lines or polygons).

This presents a problem for small devices, such as the iPhone. As powerful as they have become, they will never match larger computers and the data we record and store is tailored to these more powerful computers.

It is recommended that you only extract the data that you need to use with a small buffer around it for context information. This helps to keep the number of features to a low value and minimizes wait times for a map to be drawn.

If your data is very detailed, that is, it contains a lot of vertices per feature, then you can generalise that layer as you extract it. This will reduce the number of vertices where possible and so reduce the storage size and time it takes to render them.

Please note that generalisation will reduce the detail of the line or polygon and it may distort the true shape of the feature if it is taken too far.

Sometimes the data we want to use comes in separate Shapefiles. For example, suppose you had data relating to capital cities around the world and used some background layers to provide context information in different continents. It is better to have as few layers as possible in order to reduce rendering time.

If you can combine your background layers into a single Shapefile and then load that to the iPhone, you will find the application performs much better because it can remove unnecessary features from the rendering pipeline very quickly. When they are spread across different layers, each layer must be queried for any features in the viewing area. Each query uses valuable resources and caused more time to pass before a map