

ArcGIS Mobile Application

User's Guide

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ArcGIS Mobile User Interface Essentials

1

Welcome to the ArcGIS Mobile Application, the mobile GIS mapping and data collection application. You can use the ArcGIS Mobile Application to:

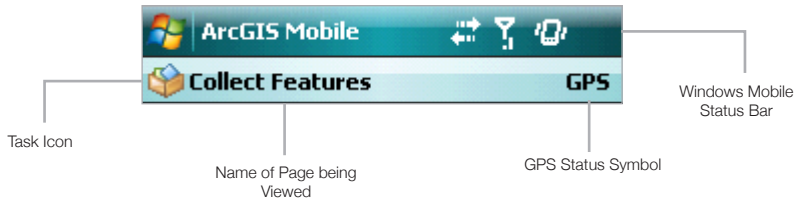
- View and navigate maps and features
- Collect new GIS features using a GPS device
- Inspect and record the state of features and assets
- Search and organize map features requiring field visits
- Update existing GIS feature attributes

An important advantage of using the ArcGIS Mobile Application is the ability to receive and send data updates from a central ArcGIS Server when out in the field. This ability to synchronize information enables everyone to have a common, dynamic view of the latest information. Field work is accomplished in the application through the use tasks that guide you through the various processes. For example, if your job is to collect using a GPS receiver the location and status of a fire hydrant installed in a new subdivision, the Collecting Features task will guide you through the process of picking the fire hydrant feature type, collecting its location using the GPS receiver and setting status information using a form-based interface.

ArcGIS Mobile is designed to provide an intuitive, workflow-driven experience to guide you through the tasks needed to perform in the field using a series of pages and menus. Throughout the course of using the application, you are presented with helpful information and a consistent set of pages and menus to guide you through your field work.

Title Bar

The title bar indicates which page you are currently viewing. Since tasks contain a series of nested pages, knowing which page you are viewing at any given time is extremely important. The title bar displays both the name of the page you are currently viewing and a graphical icon representing the task that it is contained within.



The title bar is also used to convey changing status information. When a GPS receiver is detected, the title bar will read “GPS”. If you do not have a GPS device connected, GPS will not appear on the status bar. You can manually connect or disconnect from a GPS receiver from the GPS status page. To access the GPS status, click on the Status Task on the task page.

Menu Bar

The menu bar is the primary means of navigating between pages in the application, and performing the actions required to complete field tasks. The left menu button represents the default and most obvious action that can be taken on the page. The right menu button is always titled “Menu” and provides additional functionality that is specific to the task and/or selection on the page.



Hardware Buttons

The ability to provide one-handed operation can be quite valuable in the field. The ArcGIS Mobile application leverages the device's built-in hardware buttons (the left and right soft keys and the rocker) as sources of input so that a stylus is not required for any operation within the application.



Though the various device manufacturers organize their hardware buttons slightly differently, all Windows Mobile devices include a left soft key, a right soft key and a rocker key with directional pad.

Working with ArcGIS Mobile Projects

2

With ArcGIS Mobile, you work within a mobile project. The tasks that define your field workflows and the maps that you use to accomplish those workflows are stored within projects. When you take ArcGIS Mobile to the field, your ArcGIS Mobile project folders are stored on your mobile device—either on a storage card or in main memory.

Each project contains an ArcGIS Mobile Project file (filename.amp). This file contains the projects' task and layer settings along with additional information used by the application. The project folder also includes a mobile map for use on your mobile device contained within a sub-folder called MobileServiceCache. This same folder will also hold all the map data that is to be received from the server and any updates to the data that get made and stored on the device in the field.

Inside of the project folder You may also find additional files such as a .sync and a .work file. These files are used to manage information that you work with in the application.

Creating ArcGIS Mobile projects

ArcGIS Mobile projects are created by GIS staff in your organization using ArcGIS Desktop and ArcGIS Server. They are subsequently loaded onto your mobile device for your use in the field. You may however be asked to download and load projects onto your device.

Loading Projects onto your ArcGIS Mobile Device

There are 3 primary ways that ArcGIS Mobile projects are loaded to a mobile device:

- Using the Project Page to download a new project from a server
- Opening a web browser on the device to access the corporate web page, then downloading the project to the device
- Copying the project to the device manually (laptop or SD card) or using a 3rd party mobile deployment system

Finding your Project Folder

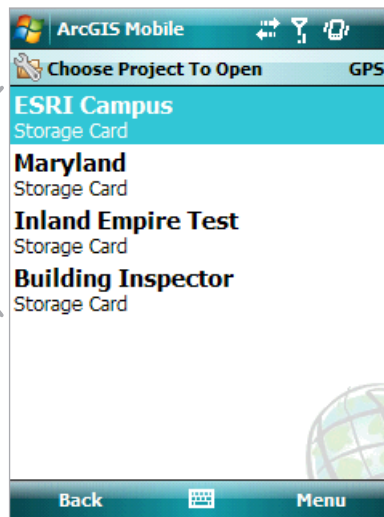
Using the file explorer on your mobile device, you can locate the project folder (either on main memory or on the storage card) at \My Documents\ArcGIS\<Project Folder Name>. You can open the .amp file directly from this location or access it directly from within the ArcGIS Mobile application using the Open Project... menu item located on the Tasks Page.

If you downloaded a project file from your corporate web page, tap on it to open ArcGIS Mobile. When ArcGIS Mobile opens the project file it will create a new project folder at a location that you specify.

Opening an ArcGIS Mobile Project

The Project Page contains a list of all projects that are stored locally on the device. The Project Page will appear when you start ArcGIS Mobile if you have either no projects on your device, or if you have more than one project on your device. If you have exactly one project, it will open automatically.

List of all projects
stored on device



If you have more than one project, highlight a single project by moving the directional pad on the rocker and then press down or tap the project with the stylus.

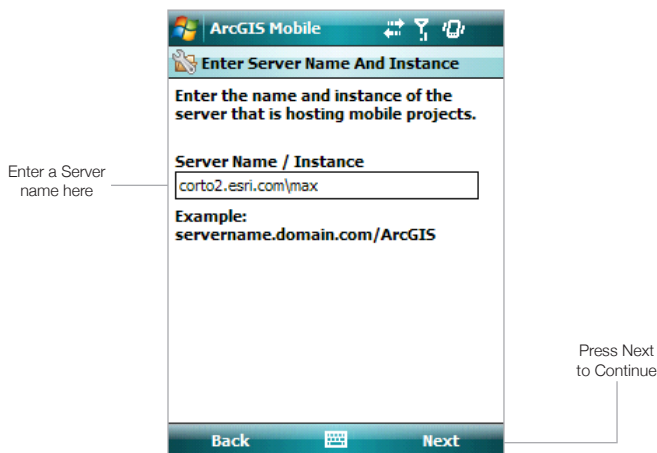
If you only have just one and only one project on your device, that project will be opened by default when you start ArcGIS Mobile. To open another project, press Open Project... from the Menu located on the Tasks page.

Downloading Projects

If there are no projects on your device or if you need to download a new project from the server, you can do so by selecting Download Project from the Menu on the Project Page.

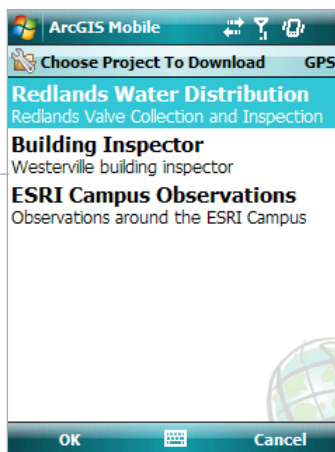


On the Download Page, you will need to enter the name of the server that contains a mobile service with published projects.



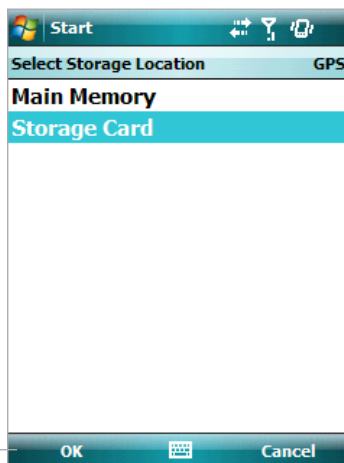
Tap the Next soft key to present a list of all projects that are available for you to download to your device. Highlight the project you wish to download and press OK.

These are the projects available for use on the device.



If you have a storage card on your mobile device, you will be prompted for which storage location you would like to place your new mobile project. If you plan to pull a large amount of map data from the server, it is recommended that you choose a storage card over main memory.

Press OK



Once you choose a storage location and press OK, the mobile project will be downloaded to your device. A new project folder will be created underneath the storage location specified (<Storage Location>My Documents\ArcGIS\<project name>).

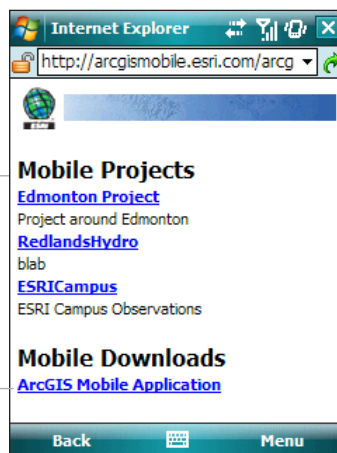
With the project now on your device, you will see it appear on the Projects Page. Select the project and press down on the rocker to open it. The first time that you open a new project, it will connect to the mobile service specified in the project configuration and create a folder on your mobile device to cache data into. This can take some time depending upon the strength of your connection. It is recommended that you do this when either connected to your computer or when you have a good quality wireless or cellular connection. If you do not have a connection, an error message will appear.

Downloading Projects and Application updates from the Web

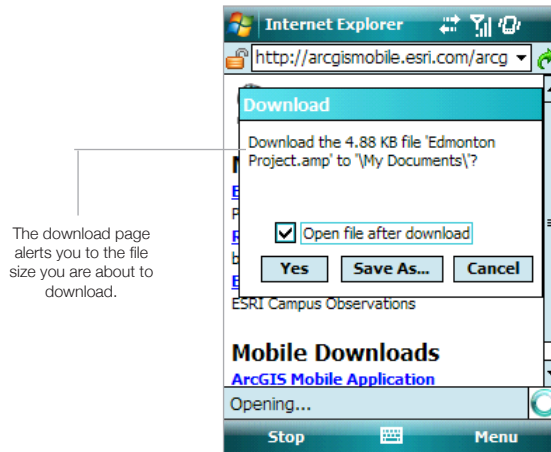
If you need to download the latest version of the ArcGIS Mobile application, or if you want to browse the corporate web page for recently published projects, you can do so by using the Web browser on your mobile device.

The corporate web server that contains the projects you work with has a Web page that contains links to each mobile project that has been published and a link to the latest version of the ArcGIS Mobile application. To access the corporate web page on your device, first open a web browser and then type `http://server_domainname/instance_name/mobile` in the address bar.

Use the Web browser on your Windows Mobile device to access your own projects and application updates from ESRI.



Once you access the web page, you can then click on a project link to download the project to your mobile device.



A dialog box will appear asking if you would like to open the project after you download it from the server. If you choose to do so, make sure that the ArcGIS Mobile application is not running on your device. If you decide not to open the file after it downloads to your mobile device, you can open it using the file browser when you are ready to start the project.

You can also download the latest version of the ArcGIS Mobile application from this web page. If you click on the ArcGIS Mobile application link, it will download the application installer (.cab file) to your mobile device. If you have a previous version installed, you will need to uninstall it prior to installing the new one. If you are unsure of how to install/uninstall applications on your mobile device, please contact your system administrator.

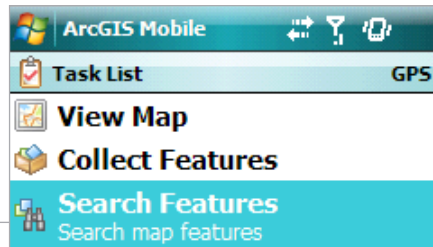
Working with Tasks

The Tasks page is the first page that you see when you open an ArcGIS Mobile project. A task is a guided set of actions used to complete a given field operation. For example, when collecting a new GIS feature, you first choose the type of feature you wish to collect, create a new geometry for the feature using either the stylus or GPS, and then assign attribute values. All of these actions are a part of the Collect Map Features task.

The tasks that appear on the Tasks page and settings for each task are defined by your GIS staff and stored inside of the Project. For that reason, their names and descriptions may be different than what you see below, but you can identify each task by the picture used to display it.

Navigate through the list of tasks using the directional pad on the rocker. As each task is highlighted on the page, you will see both the name and description of its use. Pressing down on the rocker or tapping with the stylus will start the task.

Highlighted task
contains name and
description



Access the primary functions by selecting from the following list of default icons:

Task Icon		What it does
View Map		Map navigation, browse, layer selection
Collect Features		Manual and automated feature collection
Search Features		Finding features by defining search criteria
View Work List		Managing and organizing features in your project
Synchronize		Sending and receiving feature updates to the server
View Status		Checking GPS, battery and network status

Navigating, Browsing and Identifying Map Features

3

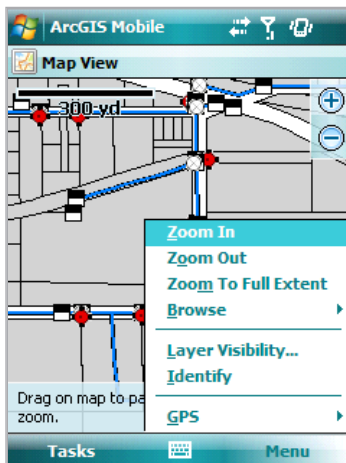
Using the View Map Task , you can explore your map by panning and zooming to areas you are interested in. Browse features that you have organized using the View Work list Task or search using the Search Task.

From the Tasks page, you can quickly view and work with a map by tapping the left soft key menu titled “Map” or by clicking on the View Map task.

Press the left soft key menu to view the map



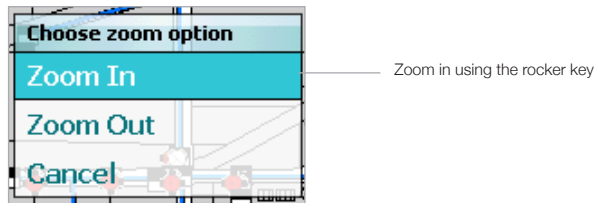
Once you click on the View Map task, a new page will appear displaying the map that was created for your project. Pressing the left soft key you can quickly return to the Tasks Page or you can press the right soft key and access a menu of functionality that lets you navigate the map, browse for features, turn layers on and off, identify features, and center your location using a GPS.



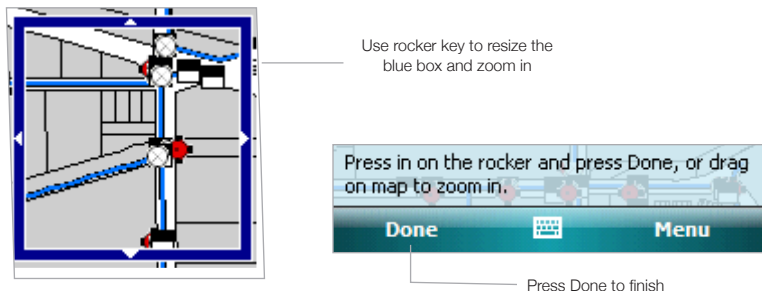
Press the right soft key to access a menu for navigation, browse, turn layers on and off, identify features, and center your location using a GPS

Navigating the Map Page

There are a number of ways to navigate on the Map Page, without choosing any tools from the menu. You can pan the map using the directional pad on the rocker by pressing to the left/right or up/down. If you press down on the rocker, a menu will appear on top of the map that allows you to Zoom In or Out. From the Zoom options menu, you can change the scale of the map.

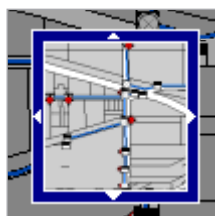


When you click Zoom In, a blue rectangle will appear around the edges of the map. If you press down on the rocker you will shrink the rectangle and zoom in even further. If you move the directional pad on the rocker up/down or left/right while the rectangle is displayed on the map you can center the location that you want to zoom into as well. Once the blue rectangle is at the proper size and location, press the Done key (left soft key) to complete the zoom. If you do nothing, the rectangle will eventually disappear. The information bar provides detailed information on how to navigate the map within the Zoom mode.

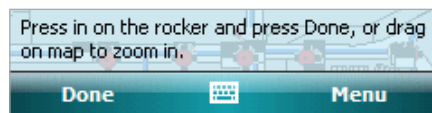


Zoom out using Rocker

When you click Zoom Out, a blue rectangle will again appear in the center of the map. This defines the extent that you will zoom out to and all map data that is external to the zoom extent will gray out. If you press down on the rocker, you will shrink the rectangle and zoom out even further. The image inside of the rectangle approximates the scale. Move the directional pad on the rocker up/down or left/right to center on the location you want to zoom out upon.



Use rocker key to resize the blue box and zoom out

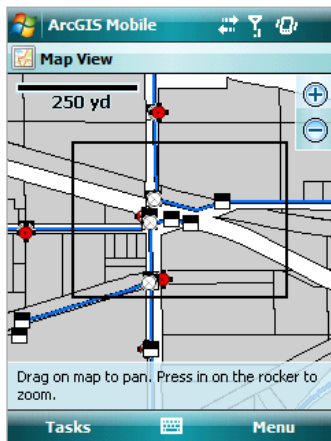


Press Done to finish

Once the blue rectangle is at the proper size and location, press the Done key (left soft key) to zoom out. If you do nothing, the rectangle will eventually disappear.

Zoom In or Out using Stylus

You can also zoom in or out on the map by using your device stylus. To zoom in, tap on the . To zoom out, tap on the  and then drag a rectangle on the map display to define the extent to which you want to zoom in or out on the map.



Tap the plus or minus icon with the stylus, then draw a rectangle to zoom in or out.

Zoom to Entire Map

Finally, you can zoom to the full extent of the map by clicking Zoom to Entire Map from the Menu soft key.



Use the menu soft key to access the Zoom to Full Extent command.

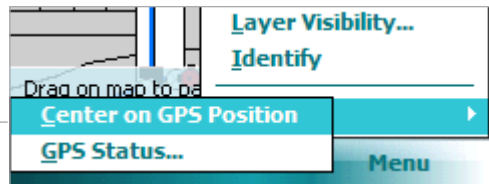
Using a GPS device for Map Navigation

If you can connect your Windows Mobile device to a GPS receiver, you can leverage the positions received from the GPS to help you locate yourself on the map.

To use GPS positions for map navigation, you must first connect to your GPS device from within the application—simply having your GPS receiver connected to your mobile device is not sufficient.

You can connect to your GPS device either directly from the Map View page or by returning to the Tasks menu and opening the Status task. From the Map View Page, tap the right soft key to access the GPS pull-right menu and then tap Center on GPS Position to start receiving GPS positions. If you need to view more detailed GPS status information or change the connection settings, tap on GPS Status.... From the GPS Status menu you can then set connection properties and then connect directly to your GPS receiver.

Tap the Center on GPS Position to start receiving GPS positions.



Start GPS from Map Page

Once you have the GPS connected, you will see coordinates appear on the GPS Status page. Pressing the Back soft key will return you to the Map View Page.



The green circle with the red arrow indicates your position and bearing on the map view.

On the Map View Page, your current location will appear as a green circle with a red arrow on top of it. This arrow indicates your bearing. You will also see a trail (or breadcrumb) of previous positions to help you visualize where you have come from.

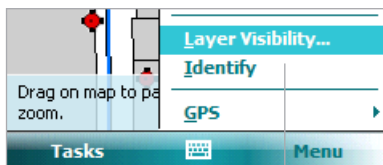
While connected to a GPS receiver, your current location will always appear on top of the map. You can force the map to automatically pan to your current location by checking the Center on GPS Position from the GPS pull-right menu.

If you check the Center using GPS button, you will see the GPS display on top of the map. As your current location changes, the GPS display will update your current location on the map. When your current location is close to the edge of the map, the map will automatically pan to re-center itself. You can use the Zoom In and Zoom Out commands to adjust the scale at which the map will pan when centered using the GPS. At any time you can uncheck the Center on GPS Position command to stop automatically panning the map.

Setting Layer Visibility

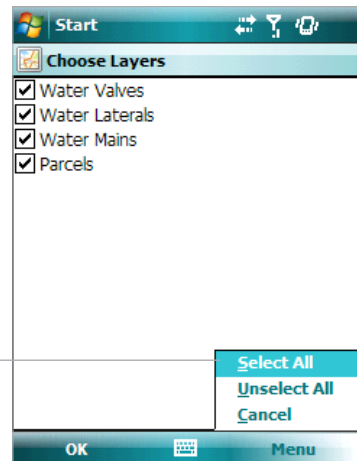
When working with maps in the field, it is important that you can clearly and quickly identify map features. Being able to turn on and off map layers when you need them is important to viewing critical information. From the map page, you can turn layers on and off using the Layer Visibility... menu item.

Use the Layer Visibility Page to turn on or off individual map layers. From the Menu soft key you can choose to turn all map layers on, turn all map layers off or cancel the page and not set any options.



From the map page use the Layer Visibility Menu to control which layers are displayed.

Select All allows you to quickly select (or deselect) an entire list of available layers.



Browsing and Identifying Features in the Map

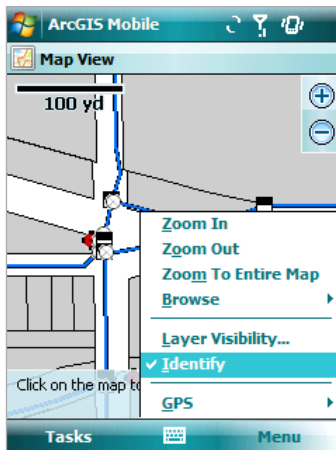
There are two primary ways that you can locate features on a map—you can use the Identify command or you can browse features that you have searched for and/or features that you have organized in your work list directly.

Identifying features using the Map

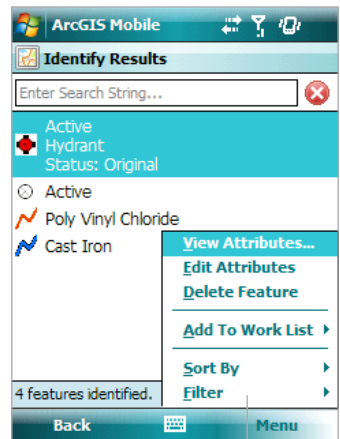
When navigating the map it can be difficult to discern one feature from another simply by viewing their relative location to you. Tapping on top of a feature, you can view all of the features' attributes, edit the feature, and/or add it to your work list.

To identify a feature, click Identify from the Menu soft key and then either tap on top of the feature using your stylus or move the current location using the rocker until it is directly on top of the feature you are interested in and press down to find it.

The Identify Results page will appear after you tap on the map and start to display features that you have searched for. If you highlight a feature in the Identify list, you can view or edit its attributes, delete the feature or add it to your work list.



Use the menu soft key to select Identify and then either tap a feature or use the rocker key to select one feature to identify.



Once you've selected a feature you can View or edit attributes, delete the feature, or add it to your work list.

Identify will find features within the cache only. You may not be able to identify certain features that you see if they are either not searchable in the project or if they are located within a base map layer.

Browsing features you have searched for using the Map

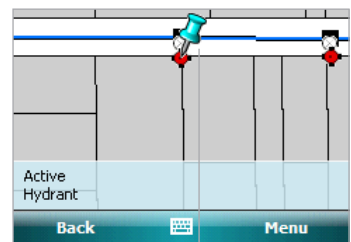
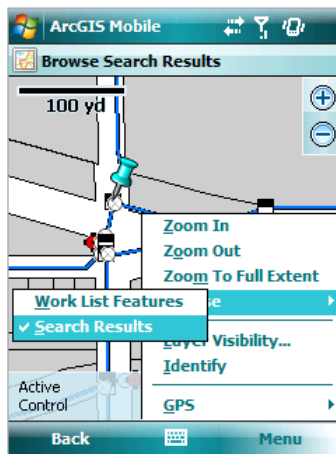
From the Browse pull-right menu you can click on which list of features you would like to browse. If you want to browse both your search results and the features in the work list, check both in the menu.

You can turn browsing on or off for features when you navigate the map by un-checking Search Results or Work List Features from the Browse pull-right menu on the Menu soft key.

Once you have checked something to browse, moving the rocker up/down now scrolls through the feature list and centers the map so that each result is in the middle of the display. The information bar will display a preview of the attribute information for that specific feature as well.

For each feature you browse to, you can view all of its attributes by pressing down on the rocker. In addition, if that feature is also editable, you can then press the right soft key to open an edit form for that feature.

You can turn off browsing for features by un-checking Browse Search Results or Browse Work List from the Menu soft key. This will return the rocker to pan mode.



Identified features are indicated with a push pin icon.

Use the menu soft key to select Identify and then either tap a feature or use the rocker key to select one feature to identify.

Creating New Features

4

Working in the field, you think about the individual objects or types of objects that you need to collect, search for and update. These objects are called features in the ArcGIS Mobile application. They are organized by their type, and can be grouped based upon a mapping classification called a Layer.

Using the Collect Features Task , you can choose from a dictionary of feature types that were prepared for you and collect a new instance of one either using the stylus or rocker on the device, a GPS receiver, or by entering coordinates directly if you have a separate handheld GPS or laser range-finder device.

The Collect Features Task provides you with a dictionary of feature types to choose from when you need to collect a new object or feature in the field. Your GIS staff has defined the set of feature types that you are using and assigned each type with some rules regarding the way that you collect both the shape of the feature and the attributes as well. All of these settings are defined within the Project that you are working with.

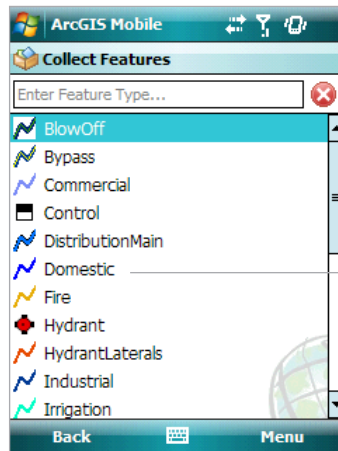
The task will guide you through the collection process using these three primary steps:

1. Specifying the feature type from the feature dictionary
2. Constructing the shape of the feature using one or more collection methods
3. Setting field values for the collected feature

Choosing a Feature Type to Collect

To collect a new GIS feature, first click the Collect Features task from the Tasks page. Note that when your GIS staff created this project for you, they may have renamed the project to something else like (Create Incident Report or Locate Infrastructure). However it was named and described, you can identify the Collect Features task by this graphical icon: 

The first step in the collection task is to specify the type of feature you wish to collect. The list of presented feature types on the Choose Feature Types Page are organized in alphabetical order. However, as mentioned above, each feature type has been organized or grouped by your GIS staff into a Layer and you can therefore group the list of feature types based upon the layer they are contained within.



Clicking the Collect Features icon brings up the Choose Feature Types page.

Each type is defined by both the symbol that is used to draw features of that type on the map, and by a name.

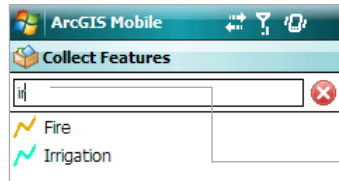
Sometimes the list of feature types that can be collected in the field gets quite long based upon what type of field work you perform and how your GIS staff organized the project. For example, if you are managing a tree species inventory, the list of feature types may include every type of tree species you may encounter in the field. In order to quickly find the feature type you need to collect, there are several ways to organize and filter the list of types that appear in the Collect Features Page.

To quickly find the feature type you need to create, you can:

- Search for feature types
- Group the list of feature types by layer
- Filter the list of feature types by layer

Search for Feature Types

You can quickly search through the list of feature types to find the one you are interested in by typing into the search list. As you start to type, the list of feature types will be reduced to display only the types that contain the letters that you typed in. You can clear the search list by tapping the Clear button or by pressing Clear Filter from the Menu soft key.

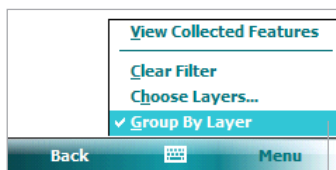


If your list of features is very long, you can type a few letters in the search window to narrow down the list.

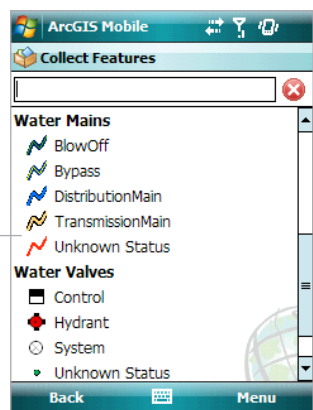
Move up and down the list using the rocker and then press down or tap with a stylus to choose the feature type you wish to collect.

Group the list of Feature Types by Layer

By default, the list of feature types are displayed in alphabetical order, however using the Menu soft key, you can group the list of feature types based upon their layer name.



Use the soft menu key to Group Features based on their layer name



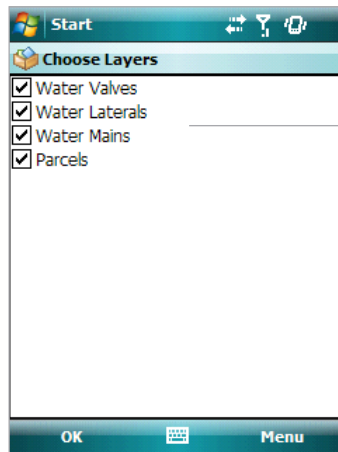
The grouped layers are easier to navigate.

This will help to organize the list based upon how the feature types are managed using layers in the map that has been created for your project. As you move up and down with the rocker you can highlight the layer name, but you will need to choose a feature type to continue the collection process.

Filter the list of Feature Types

Searching for a feature type will reduce the list based upon the letters that you type, but you can also choose which layers you would like to display feature types for. If you have to collect a lot of different feature types, this will reduce the list to a more manageable size.

To filter the list based upon layers, click Choose Layers... from the Menu soft key and then pick the layers for which you want to display feature types.



Filtering features is as easy as checking them on or off in the Choose Layers menu.

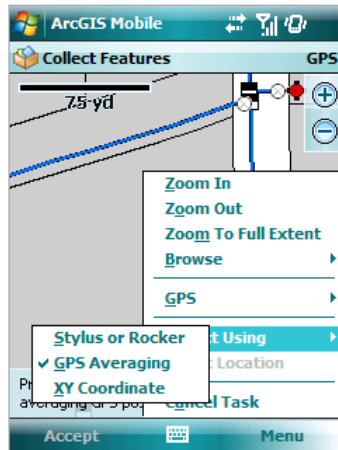
If the list of feature types is still difficult to manage, or if the feature type you are looking for is not in the list, it is recommended that you contact your administrator and either have the project updated or a new one created that is more manageable.

Collecting the Features' Shape Using the Map Page

Once you have chosen the feature type you wish to collect, the shape of the feature using the Map Page. There are three methods that can be used to collect the shape:

- Stylus or Rocker
- GPS Device
- XY coordinate

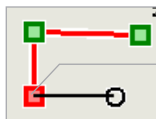
You can choose which method you wish to collect shapes for by tapping the Menu soft key and then the Collect Using pull-right menu. The information bar will provide you with details on how to collect a vertex using the collection method you have chosen.



There are three methods available for collecting features using the Map Page.

When constructing a line or polygon feature, you can switch between collection methods for each vertex within the shape. For example, you may use GPS averaging to capture one corner of a sports field, then use the XY Coordinate method to construct a second corner, and a stylus to capture a third.

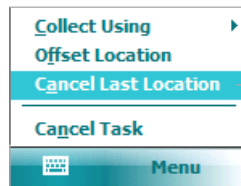
Regardless of whether or not you are collecting a point, line or polygon feature, the shape you are collecting has the concept of an “active vertex”. The active vertex is the last vertex that was added to the feature:



The red square indicates the last vertex placed or the active vertex.

The process of collecting the shape of the feature requires that you accept the collected shape before you can set attribute values for the feature. This provides you with the opportunity to review the shape that you have collected, cancel the last location or vertex you have added, offset the active vertex, or cancel the task if the constructed shape does not meet your requirements.

To undo the last vertex that was collected for a line or polygon feature, click Cancel Last Location from the Menu soft key. If you are collecting the shape of a point feature, you can either cancel the task itself or simply set the location a second time—there is no need to cancel its location.



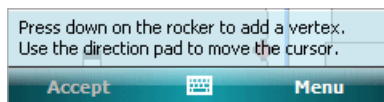
Use the Cancel Last Location command to remove a vertex placed in error.

While you are collecting vertex locations, sometimes you may need to offset the location using a bearing and distance measurement. You can do so using the Offset Location command. Refer to the section on the Offset Location command for more information.

Collect Shape Using Stylus or Rocker

You can collect the shape of the new feature using the stylus or rocker and tapping on the map to set the location. The current location of the cursor indicates the location of the vertex that will be collected if you press down on the rocker. Move the rocker up and down, or left and right to change the location of the cursor. If the cursor comes close to the edge of the screen, the map will pan in that direction. If you need to zoom in or out on the display, press the Menu soft key to access the zoom controls.

The information bar will guide you through the process of using the rocker to collect a vertex.

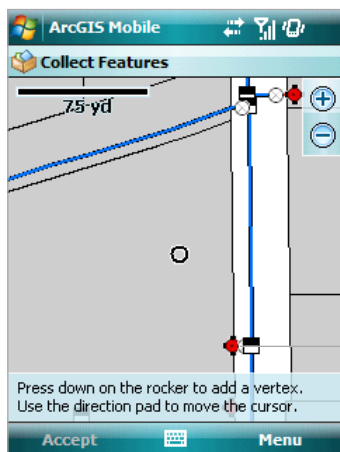


Information displayed in this space assists in the collection process.

Collecting Point Shapes Using Stylus or Rocker

The process of creating a point shape using the map is a matter of identifying the correct location by either tapping with the stylus or by moving the cursor left and right or up and down with the directional pad on the rocker to identify the precise point location and then pressing down to create it.

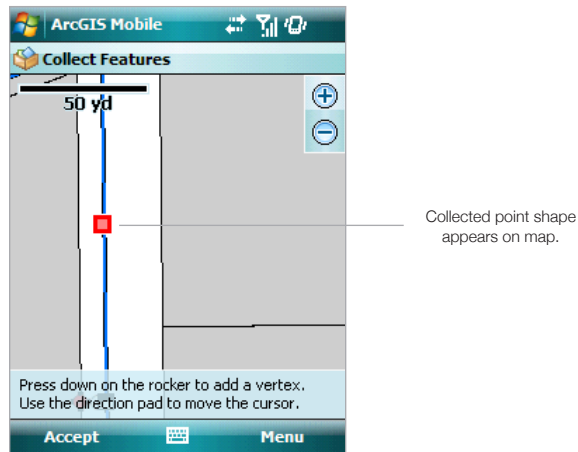
Until you press down on the rocker or tap using the stylus, the Accept soft key button will be grayed out. Collect at least one vertex in order to continue with setting attribute values for the new feature.



Collected point shapes appear on the map.

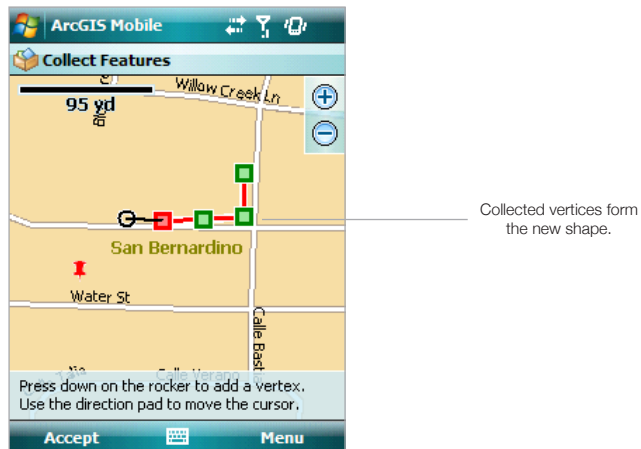
Once the point is displayed on the map, you can either click the left soft key to accept the location and proceed to setting attributes for the new feature, set the location again if it is not in the correct location, or offset the location using the Offset Location button on the right soft key menu.

If the point is not in the correct location, you can either move the cursor using the directional pad again and then press down to set a more accurate location or cancel the collection task by clicking Cancel Task from the Menu soft key.



Collect Line Shape Using Stylus or Rocker

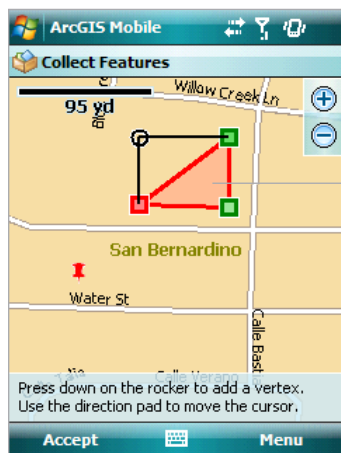
To collect a line shape using the stylus or rocker, use the directional keys on the rocker or tap on the map using the stylus to construct each vertex of the line. Once two vertices have been created, the Accept soft key button will become enabled, and you can accept the shape and proceed to setting its attributes.



Note that during the collection of each vertex, you can change the collection method (Enter XY Coordinate or Collect Using GPS), or you can offset the active vertex using the Offset Location command.

Collect Polygon Shape Using Stylus or Rocker

To collect a polygon shape using the stylus or rocker, use the directional keys on the rocker or tap on the map using the stylus to construct each vertex. Once three vertices have been created, the Accept soft key button will become enabled so you can accept the shape and proceed to setting its attribute values.

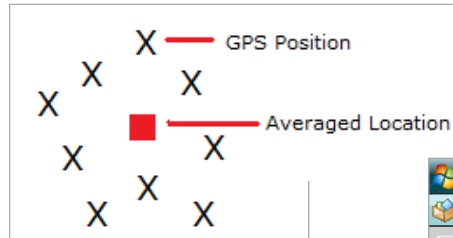


Collected vertices form a new polygon shape.

As in the case with the collection of points and lines, during the collection of each polygon vertex, you can change the collection method—Enter XY Coordinate or Collect Using GPS—or you can offset the active vertex using the Offset Location command.

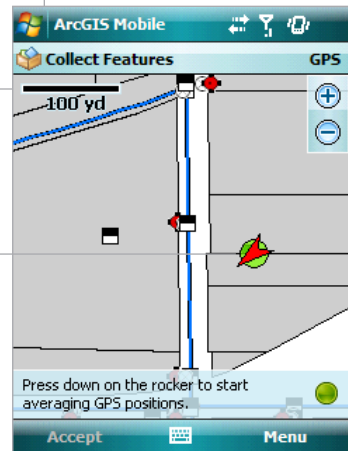
Collect Shape Using GPS

ArcGIS Mobile uses a technique called GPS Averaging to collect vertex locations using a GPS receiver. This technique provides the most accuracy possible when collecting point, line and polygon shapes. It involves the act of physically standing at or near the location for which you need to capture a point or vertex, receiving a set interval of GPS positions from the receiver that meet specified quality standards for the feature type, and then averaging the results of all positions collected.



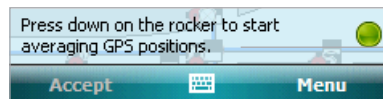
GPS Averaging calculates the central tending position among multiple GPS readings.

The averaged location is a single GPS position.



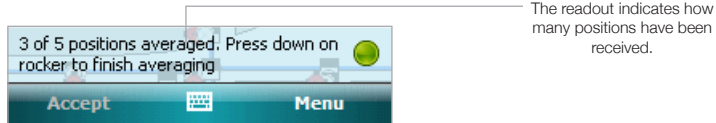
Collect Using GPS Averaging Process

When you choose the Collect Using GPS Averaging tool, the information bar will indicate the need to press down on the rocker to start averaging GPS positions. It will also display a green or red circle. The color of the circle indicates whether or not the positions that are currently being received match the collection settings set for the feature type specified (green = yes, red = no).

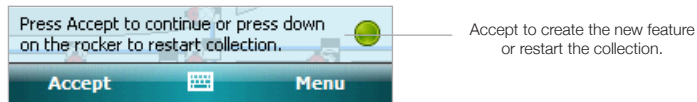


The green circle indicates a matched reading.

Pressing down on the rocker will start the averaging process and the information bar will update to indicate how many positions have been received and how many need to be received in order to compute an average.



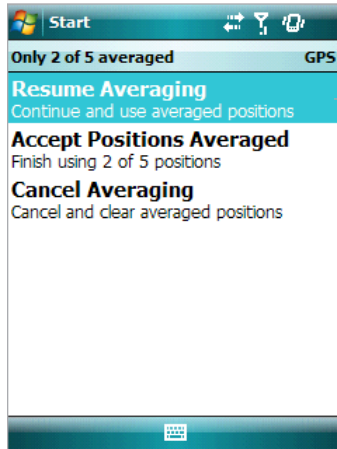
Once you have captured the required number of positions, press down on the rocker again to finish the averaging process. If you are collecting the shape of a point feature, the Accept button will enable and the information bar will indicate that you can either restart the collection process or press Accept to finish.



If you are collecting a line or polygon feature, pressing down on the rocker will collect the location of the next vertex. If you would like to restart collection for the vertex you just captured, tap Cancel Last Location from the Menu soft key.

The number of positions that need to be received in order to compute an average is a property of the GPS collection settings. Depending upon field conditions, you may need less than the value specified. The value is therefore a “recommended minimum”. At any time you can press down on the rocker and stop the collection process. If you stop the averaging process before collecting the minimum value, you will be notified that you have captured fewer than the minimum number of positions required, but you’ll still have the option to accept.

If you inadvertently pressed the rocker, you can continue by selecting Resume Averaging. If the number collected is of good enough quality and the minimum value is set too high for your current field conditions, you can accept the number that you have averaged and finish the averaging process. Finally, you can simply cancel averaging and start again or cancel the task entirely.



If less than the minimum positions are averaged, you are presented with several options.

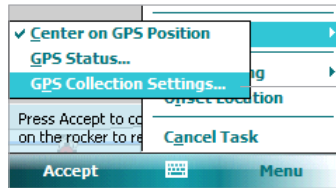
If you cannot meet the recommended minimum number of positions because the quality circle is red, you may consider changing the GPS collection settings or choosing an alternative method for collecting the location.

During the collection process you may also encounter problems acquiring a GPS signal. If this happens when collecting positions using GPS, the GPS display icon will begin to flash. GPS positions received during this time will most likely not match your GPS quality filter settings. If problems persist, you should either lower the filter constraints or consider using an alternative method for collecting the location. For example, if you cannot acquire a good GPS signal because you are too close to a building structure, then pace off from where you are standing to a location where you can receive a good fix and then use the Offset Location tool to locate the averaged GPS location to the desired location.

GPS Settings

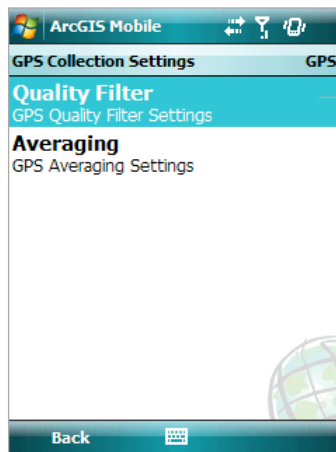
When you are using a GPS receiver to collect the shape of a feature, you may need to access more information about the GPS positions that you are receiving. Field conditions may also demand that you alter some of the GPS collection settings set for the layer into which you are collecting features.

You can access GPS collection settings and the GPS status page from the GPS pull-right menu located on the Menu soft key.



Use the menu soft key to access the GPS collection settings.

GPS collection settings are established for each feature type that is set up for collection..



GPS settings are either in terms of quality or averaging

GPS Collection Settings

GPS collection settings are used to establish a level of quality or accuracy to the location of the vertices that you create in the application. GPS collection settings are divided into three categories:

- GPS Quality Filter
- GPS Averaging

GPS Quality Filter

To ensure that the collection of a vertex using GPS is as accurate as possible, ArcGIS Mobile applies a GPS quality filter to each position that is read from the GPS receiver. If the position read meets the quality filter specified, it will be used in computing the vertex location for the feature being collected.

The GPS quality filter is set for each feature type and is based upon 2 key factors: GPS Fix Type and PDOP.

GPS Fix Type

Depending upon the GPS receiver in use and the type of GPS data collection you are performing, you may want to filter the positions received from the GPS receiver based upon a certain fix type. For example, you may want to ensure that only differentially corrected GPS locations are used in the averaging process, ignoring all autonomous read positions when using a WAAS-enabled receiver.

If the GPS fix type from your receiver is different than the GPS fix type that you have established when setting the quality filter, you may still be able to average GPS positions. This can occur if the fix type you are receiving is of higher quality than what the filter will accept. The hierarchy of fix types is as follows:

- Real Time Kinematic
- Float Real Time Kinematic
- Differential GPS Fix
- GPS Fix
- Estimated Fix

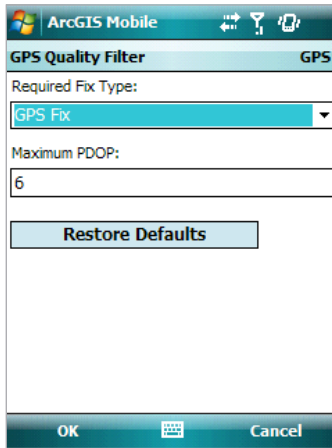
For example, if the GPS receiver fix type is Differential GPS Fix (DGPS) and the filter setting is GPS Fix, you will be able to average positions.

PDOP

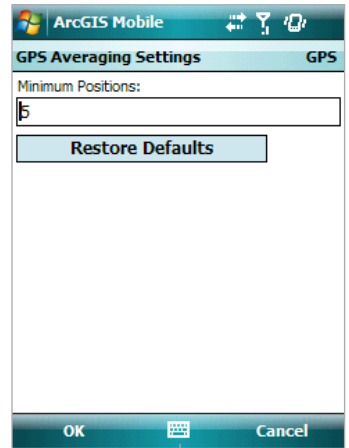
In addition to the type of fix that you are receiving, you may also want to filter positions based upon the geometrical strength of the GPS satellite configuration. PDOP (Position Dilution of Position) is a numeric value representing the amount of error in the position read. Setting a PDOP value as a part of the GPS quality filter will ensure that only positions with a PDOP equal to or less than the set value will be used to create the average.

You can always see what the current quality filter settings are by tapping Quality Filter from the GPS Collection Settings page. If the values cannot be changed, it means that when the project was defined it was determined that the settings specified must be met and cannot be changed in the field. If they are editable, you can change both the required fix type and the PDOP settings within the application.

Please note that these values will not be stored in the project and are set for the lifetime of the application only.



The GPS Quality Filter controls the type of fix and the PDOP threshold



The GPS Averaging Settings allows you to control the number of positions required to achieve a good reading.

GPS Averaging Settings

GPS averaging is based upon a number of GPS positions that are collected using a set GPS quality filter. Each feature type has a recommended minimum value specified based upon the number of positions that should be received in order to calculate a proper average.

If you click on GPS Averaging from the Collection Settings page, you can change the recommended minimum number of positions that need to be averaged. This can be quite useful after changing the quality filter settings. For example, if you can acquire a WAAS corrected GPS fix, it will most likely require less positions to calculate an accurate location.

GPS Status

If you are experiencing difficulty receiving a good quality GPS position, looking at the GPS status information that is coming from the receiver will help you in changing your collection settings.

For example, from the GPS Status page you can access GPS quality information such as the current fix type, number of satellites being read, and PDOP/HDOP values.



GPS Quality status readings as they appear in the application display.

To access the GPS status page, click GPS Status... from the GPS pull-right menu located on the Map Page.

Collect Using XY Location

If you are collecting vertices, you can directly enter on XY location for a point using the XY Location button located inside of the GPS pull-right menu the Map Page. This can be quite useful if you are working with a GPS receiver that is not connected to your mobile device. Most of these devices have their own display and can represent location in decimal degrees. Note that the Using XY Location page is looking for coordinates stored in the WGS84 format. You should check your GPS receiver to make sure it is displaying coordinates using WGS84.

Coordinate types include decimal degrees using the WGS84 transformation or decimal degrees using the transformation applied to the map. You should always

A screenshot of a dialog box titled "Collect Using XY Location" with a "GPS" button in the top right corner. The dialog contains the following text and fields:

- Text: "You can enter the XY location for a point feature by typing in the coordinates"
- Text: "If the coordinates are stored in a different measurement system than your map, you can change the unit type."
- Text: "Coordinate Type"
- Dropdown menu: "Decimal Degrees (WGS84)"
- Text: "Longitude"
- Text input field: "-117.195848571429"
- Text: "Latitude"
- Text input field: "34.0564723809524"
- Buttons: "OK" and "Cancel"

XY locations in decimal degrees can be entered manually into the application.

use WGS84 if you are receiving longitude and latitude readings from an external GPS unit.

By default, the longitude and latitude values that are displayed in the dialog represent the location at the center of the map display.

Once you have typed a latitude and longitude coordinate values, tap OK to return to the Collect Features page.

Offsetting Collected Locations

A common problem that is faced in the field is that a feature you are trying to collect, or a portion of it, is sometimes in a place that is either inaccessible or too dangerous to occupy. There are several ways that you can collect this location, but here are two of the more common:

1. Find a location that you can safely occupy and use GPS averaging to generate a new vertex location.
2. Estimate the distance and azimuth of the inaccessible location or use a hand-held laser range finder to obtain the slant range and azimuth to the location of interest.

There is no way to connect a laser range finder to the ArcGIS Mobile application so you must manually enter both the azimuth and distance value. You can change the distance units on the Offset Page based upon the unit of measure that you are using.

ArcGIS Mobile

Offset Current Location GPS

You can offset the current vertex location using a bearing and distance from your current position.

Bearing:
45

0 Degrees is East
90 Degrees is North

Distance Units:
Foot

Distance:
15

OK Cancel

Manually enter laser range-finder values directly into the application

After entering a bearing and distance measurement, press the left soft key to accept and return to the Collect Features page. The map will display the offset location.

You can then click Accept to use the offset location for the new feature.

Setting Field Values

Each feature type in the Collect Features list has a set of default values that will be applied to a newly constructed feature based upon how your GIS staff defined the map. After setting the location of the feature, the Edit Attributes page displays a list of fields and a set of entry boxes into which you may need to enter values. By pressing right on the rocker you can navigate between data entry controls. If the number of fields is longer than the length of the page, you can scroll down to view additional fields.

Depending upon the type of information you need to enter, you may see a different entry dialog. Where possible, a drop down list will appear that will let you pick from a list of values. This will help you to avoid typing mistakes.

The screenshot shows the 'Edit Attributes' screen in ArcGIS Mobile. The screen is titled 'Edit Attributes' and has a 'GPS' status bar at the top right. The screen displays a list of fields with their corresponding values: 'AS_BUILT' is 'Proposed', 'INSPECTION_DATE' is 'Thursday, April 10, 2008', 'NEEDSINSPECTION' is 'Yes', 'InspectedBy' is 'Ryan Olson', 'InstallDate' is 'Thursday, April 10, 2008', and 'ValveType' is 'Hydrant'. The screen has a 'Finish' button at the bottom left and a 'Cancel' button at the bottom right. A 'GPS' status bar is at the top right.

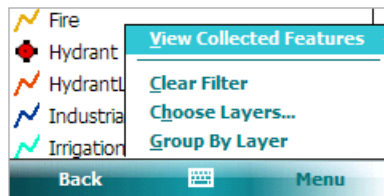
Once a feature has been created, the Edit Attributes Page appears.

Tap the Finish soft key to complete the collection task and create a new feature or tap the Cancel soft key to abort the entire task. Once you are finished, you are taken directly back to the Specify Feature Types Page so that you can choose a new type of feature to collect, continuing your collection workflow. In addition, you can then view the features that you have collected using the View Collected Features menu item.

Knowing what you have collected

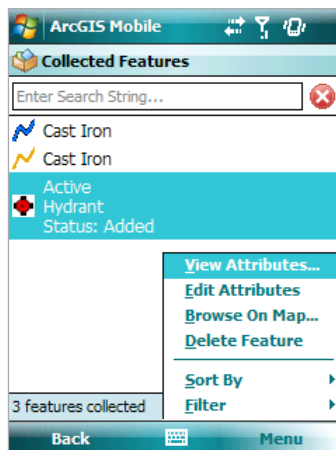
Quite often in the field, you will repeat the task of collecting features over and over. At some point during that collection process—perhaps after collecting a series of naturally grouped features—you may want to review the list of features that you have collected. This may include viewing their attributes, browsing them on a map, and as a result changing them in some fashion.

From the Choose Features page in the Collect Features task, you can view all features that have been collected since you last posted changes to the server by clicking on View Collected Features from the Menu soft key.



View Collected Features allows you to review your collection work as you proceed.

The View Collected Features page displays a list of all features that have been collected since the last time you successfully posted changes.



From the list of collected features, you can pick one to work with further.

For each feature that you have collected, you can view or edit its attributes, browse it on the map, or delete it. The status bar provides you with a running total of how many features you have collected. Use the search, sort by and filtering capabilities of the list to quickly find a specific feature that you have collected.

If you need to send your feature updates back to the server right away, return to the Tasks Page and then click on Synchronize to access the Synchronize Page and post your updates. Refer to the section on Synchronization for more information.

Searching and Finding Features

5

Use this graphical icon to access the Search Features task: 

When working in the field you are often assigned a region to work in—like “Collect all park furniture in Ford Park” or “Inspect hydrants between 5th and Church Street and Baseline and Weaver Street”.

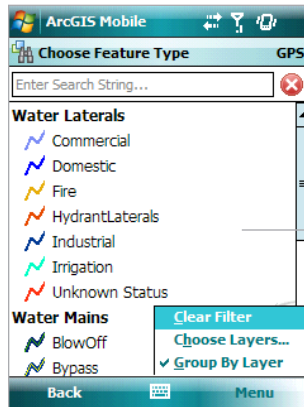
If you need to inspect or update existing corporate assets in the field, you can use the Search Features Task to find features either within a map extent, or by some form of a query. You can then take the features that you find and organize and store them into a list using the View Work List Task so that you can ensure you visit/update each and every one of them in the region assigned to you.

Using the Search Features Task is much like using the Collect Features Task:  You first specify what you are interested in finding and then you can perform your search using a query that you define in the Search Page.

Choosing What to Search For

Once you click on the Search Features Task on the Tasks Page, you can begin to search for features in the map. The first step in defining your search is to choose the type of feature that you are looking to find or if you don't know the specific type, then the layer that you think it may belong to.

The list of feature types and layers may be a subset of what you see in your map. When building the project that you are working with, your GIS staff defined what could be searched for when using the Search Features Task. If you cannot find the features you have been assigned to inspect or update, contact your administrator.

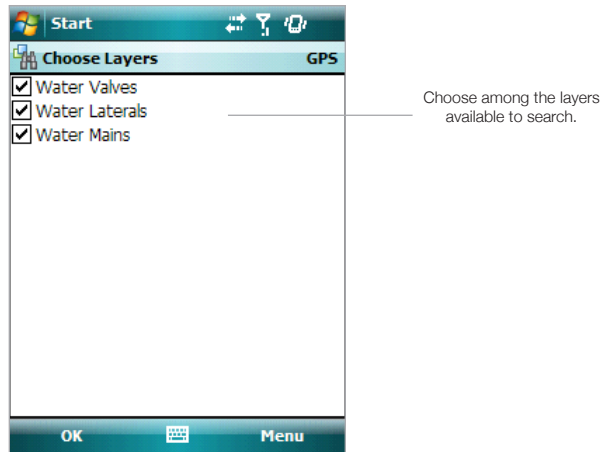


This list makes it easy to search for just one certain type of feature.

The Choose Feature Type Page is designed so that you can quickly and easily find the type of feature that you need to search for. It contains a list of all feature types and they are sorted in alphabetical order. You can choose the type of feature to search for by scrolling through the list of types until you get to the one you are interested in searching against. Tap it when highlighted to lock in the choice.

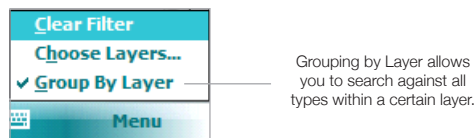
The list of feature types may be fairly long, so if you know the name of the feature type you wish to search for, you can constrain the list of feature types that appear by typing into the search bar.

If the list is still difficult to manage, narrow the list of feature types even further by clicking Choose Layers... from the Menu soft key. The Choose Layers page lists every layer that contains feature types you can search against. Uncheck the layers that you do not want to appear in the list.



The feature type list is sorted alphabetically by feature type name. Sometimes you may not know what feature type you want to search for. But you may know the name of the map layer or you may be given some criteria by which to search. For example, you may need to search for “all valves that need inspection”. In this case, the search will span across multiple feature types

You can search against all types within a layer by first grouping the list by the layer name. To do so, click Group By Layer from the Menu soft key and then tap on the layer name from the list instead of tapping on the feature type.

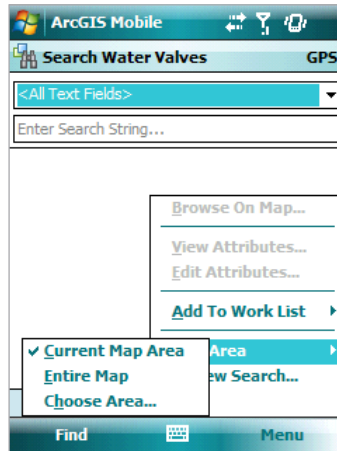


Defining Search Criteria

Once you have chosen what you would like to search for, then define your query using the Search Page.

The title bar of the search page will display the name of the feature type or layer that you are searching. Using the fields drop down, refine the search based upon the name of the field or choose to search against all fields by setting the value to “<All Fields>”. It is important to understand that your GIS staff have chosen what

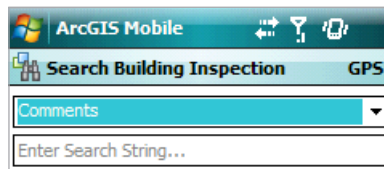
fields are displayed in the drop down list, how they are named, and what type of entry box is used to define the query for that field name.



To improve the accuracy of you search, the page will change the way that you build your search query based upon the type of field you select. If you do not know which field contains the text that you want to search using, you can simply perform a textual search against all field types by choosing <All Fields>.

Text Fields

Searching against a text field is relatively straightforward. The text entry box gives you a visual indication that it is a text field by displaying gray text which indicates what you should do in order to search. Tap the gray text or use the right/left rocker to give the text entry box focus, then type the text you would like to search for. To start the search, press down on the rocker or press enter if you have a QWERTY keyboard, or press the Find button.



Numeric Fields

If you pick a numeric field, an additional drop down list will appear in order to define an operator for the numeric search. In this way, you can query the field not only for an exact value, but by using an expression such as equal to, less than, less than or equal to, greater than, greater than or equal to, or not equal to a specific value.

The screenshot shows the 'Search Control' window in ArcGIS Mobile. The 'GPS' tab is active. The first dropdown menu is set to 'OUTLET_SIZE'. The second dropdown menu is set to 'Greater Than'. Below these is a text input field labeled 'Enter Numeric Value...'. A line points from the text 'Searching a numeric field brings up an additional search constraint.' to the second dropdown menu.

Searching a numeric field brings up an additional search constraint.

Once you choose a numeric operator, you can then enter the numeric value in the field below. Note that the entry box will accept numeric values only.

Date Fields

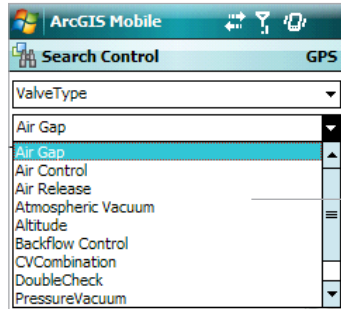
If you search using a date field, you can choose a date range for your search much like you can choose a numeric operator when searching for numeric values. Date ranges are based upon the date you specify.

The screenshot shows the 'Search Control' window in ArcGIS Mobile. The 'GPS' tab is active. The first dropdown menu is set to 'INSPECTION_DATE'. The second dropdown menu is set to 'After'. The third dropdown menu is set to 'Thursday, April 10, 2008'. Below these is a calendar widget for April 2008. The date '10' is selected. A line points from the text 'Selecting a date field brings up calendar-based date selector.' to the calendar widget.

Selecting a date field brings up calendar-based date selector.

Fields with Business Rules

Your GIS staff can attach business rules to certain fields. If you pick a field that has a rule associated with it, a drop down list will appear and present each valid value listed for the rule. This will alleviate the need for you to type in the text on your device.



Business rules allow the GIS staff to set strict limits on what values can be entered into a given field.

Navigate between the drop down lists and through each of the search controls by pressing left or right on the rocker.

Specifying a Map Extent

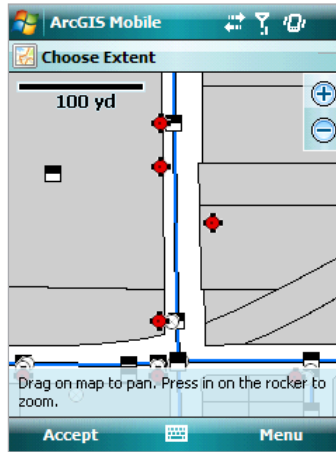
Each search that you do uses a spatial extent called the search area. By default, the search area is set to the current extent of your map. This can be quite useful if you have centered your map using a GPS receiver as this represents your current location.

However, you can change the search area to be either the extent of the entire map or by choosing a new area.



Choose within which map extent to limit the search.

If you click Choose Area..., the Map Page will appear and you can zoom in, zoom out or pan the map to set the extent you are interested in. Once you have defined the extent, tap Accept to perform the query.



The Choose Extent command allows you to use the map itself as a means of setting the search area.

If you have already performed a search, all changes to the extent will require you to refresh your query using the new area. Press the Refresh button to re-execute the query.

Once you have performed a search, the results of your search are displayed on the Search page. You can further refine the search results by performing another search. You can refine the search by either changing the spatial extent of the search or by entering a query. Each consecutive search will refine the existing search results. For example, you may perform an initial search for crime incident reports submitted where “Deputy = Newcombe” for the extent of the City of Highland and receive a large number of incident reports. A second, consecutive search where the Date Reported is later than 10/12/2007 will refine the search results to a smaller set.

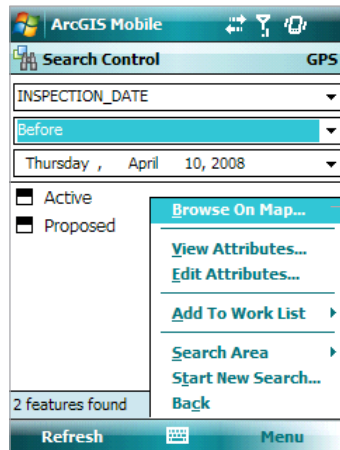
The features that you have searched for are displayed as a list on the Search Results page. There are certain actions that you can perform against each feature that was found:

- Browse the feature on the map
- View or edit the attributes of the feature
- Save features into your work list

Browsing Search Results on the Map

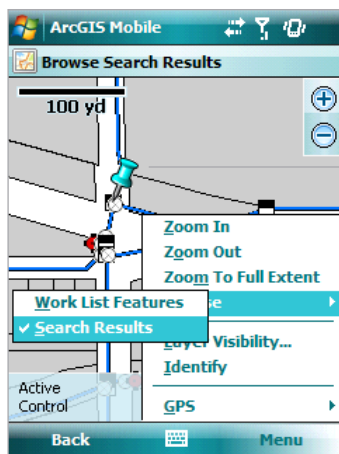
Once you have searched for a feature using the Search Features Task, you can inspect its attributes and compare that information to what you see when looking directly at the object in the field. If information recorded for the feature does not match what you see, open the Edit Attributes Page and directly update the feature.

To browse for a feature that you have found using the Search Features Task, simply highlight the feature in the list, then click Browse On Map from the Menu soft key.



Highlight a found feature then browse on the map to see the feature in its geographic context.

When the Map Page appears, the information bar will display the value of the primary display field and (if space allows), the feature type name. If the feature you searched for is a point feature, a cyan push pin will appear on top of the feature to indicate its location. If it is a line or polygon feature, the entire shape of the feature will draw in cyan.



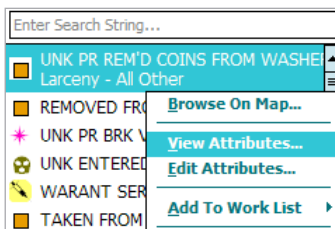
The push pin icon identifies the searched-for feature.

To pan to the next search result, press the up or down arrows on the directional pad. Press up or down to cycle through all of the search results.

To view all of the attribute values for the feature to which you have browsed, press down on the rocker to bring up the View Attributes dialog. If that feature type can be edited, you can press the Edit soft key to display the Edit Attributes page and update attributes of the feature.

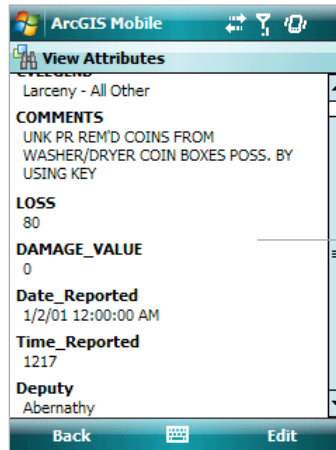
Viewing and Editing Search Results

With a feature highlighted in the search results list, you can either press down on the rocker or press View Attributes from the Menu soft key to view all attributes for the feature.



Select a feature to view its attributes

On the View Attributes Page, scroll up or down the page using the rocker or use the scroll wheel on your device if available. This list of fields that appear in the View Attributes Page, the name of the fields, and their order, are set by GIS staff when building the project.



Complete attributes for the selected feature are displayed in a scrolling window.

If the feature is editable, press the Edit soft key to display the Edit Attributes page. The list of fields that appear in the View Attributes page may be different (and in a different order) than the Edit Attributes Page. Which fields appear and their order was also set by your GIS staff when defining the project.

ArcGIS Mobile

Edit Attributes

COMMENTS
R/DRYER COIN BOXES POSS. BY USING KEY

LOSS
80

DAMAGE_VALUE
0

Date Reported
Tuesday, January 02, 2001
Abernathy
Newcombe
Willies
Smith
Jones
Abernathy

Finish **Cancel**

Make changes to attributes
and click Finish to save.

You can also access the Edit Attributes page directly from the Search Results. After editing a value, press the Finish soft key to update the feature attributes and return to the Search Results page. Press the Cancel soft key to abandon any edits you have made.

Managing Features in Your Project

6

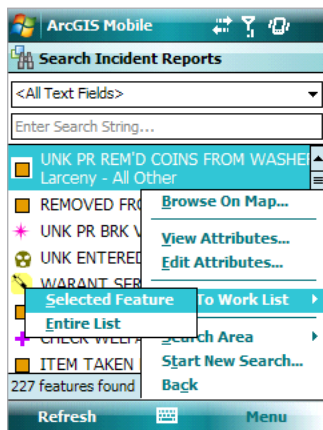
Field projects often involve validating and inspecting or updating existing information previously captured during the course of previous field work using a field GIS or survey system, or entered into a desktop GIS or CAD system from hand-drawn maps. An examples includes validating the proper installation of facilities infrastructure developed for a new city subdivision and entered into a GIS by GIS staff. Another example might involve the annual inspection of road signs or city street furniture that have historically been maintained using field GIS software.

Using ArcGIS Mobile, you can locate those features that are stored on your device using the Search Features Task. Once you have found them, you can then add them to the Work List task so that they are stored inside your project for you to organize in a way that works for how you perform inspections or updates.

Storing Features in your Work List using the Search Features Task

In order to inspect and update features in the field, you first search for them using the Search Features Task. The results of your search are displayed as a list in the Search Page.

From the Menu soft key, you can add either the highlighted feature or the entire set of features that were found to your work list by selecting the appropriate menu item from the “Add To Work List” pull-right menu.

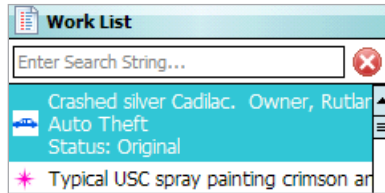


Adding a selected feature from a search result to a work list.

Viewing and Updating Features in your Work List

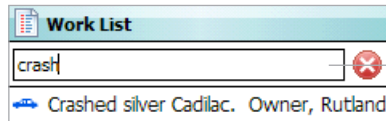
The features that you view, collect and update in the field can all be managed using a work list. This list is a feature representation of a “To-Do-List” or “Work Items list”.

By moving up and down using the rocker you can highlight a feature. When highlighted, additional attribute information is displayed so that you can determine whether or not the highlighted feature is the feature you wish to work with.



Highlighting a feature reveals additional details from the attribute table.

To quickly search for a feature in the list, type directly into the search bar. As you begin to type, the list of features will be reduced to display only the ones that contain the letters that you typed in. Clear the search list by tapping the Clear button.

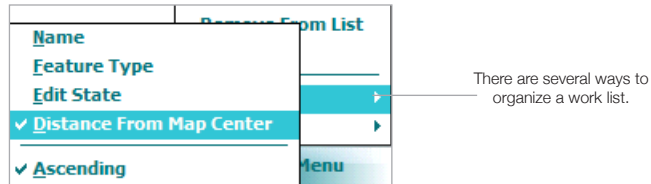


Searching within a work list.

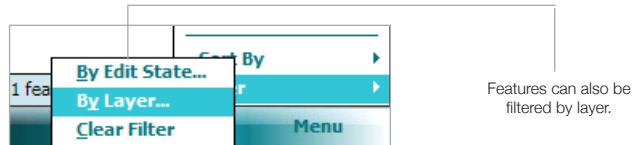
You can also sort or filter the list of features. By default, the feature list itself is sorted based upon the feature’s distance to the current location of the map. If you are centering on the current location using a GPS device, then the list is sorted based upon the feature closest to you. You can also filter the list based upon which layer they belong.

Organizing Features in your Work List

The work list can manage a large number of features. The ability to sort and filter the list will help you organize how you work in the field. By default, the work list is sorted based on the distance of the feature from the current center of the map. If you are centering your map using a GPS receiver, this will be the shortest distance between you and the feature. You could also choose to sort the feature list by its current status (created, updated, synchronized), by feature layer, or alphabetically.



In addition to sorting, you can filter the feature list based upon the layer that the features belong to. The filter pull-right menu located on the Menu soft key will display the first five feature layers and (in an additional page) display all feature layers if more than five exist.

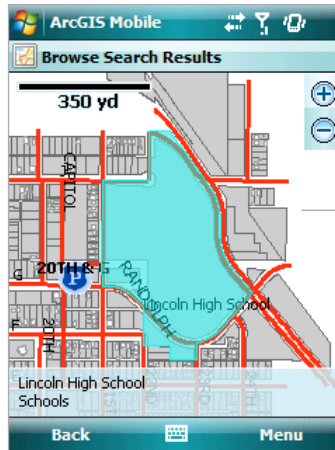


Once you have created a work list, there are several actions that can be performed on the features in that list:

- Browse features on the map
- View the attributes of a feature
- Edit the attributes of a selected feature
- Delete a feature

Browsing Features on the Map

Click the Menu soft key to browse all of the features currently displayed in the work list using the map page by clicking Browse On Map... from the menu.



Browsing features in the work list allows you to scroll spatially through the search results.

When you click Browse on Map, the map view appears and displays the first feature in the work list. The feature itself will be selected on the map and the information bar will display both the feature type and the primary display field for the feature. You can use the rocker up and down arrows to navigate through the feature list. If you press down on the rocker, you will see details about the feature currently highlighted. This will open the View Attributes page and display all of the attributes for the selected feature.

Inspecting the Attributes of Features in Your Work List

For each feature in the work list, you can view its attributes. Scroll up or down using the rocker until you highlight the feature for which you wish to view the attributes. Then either press down on the rocker to view its attributes or from the Menu soft key press “View Attributes...”.



Viewing the attributes of a feature selected from the work list.

Press the left soft key menu to go back to the work list or press the right soft key menu to edit the attributes of the feature.

Editing the Attributes of Features in Your Work List

In addition to viewing the attributes of a feature, you can directly edit its attributes by first highlighting a feature, and then pressing “Edit Attributes...” from the Menu soft key. You can also access the edit attributes dialog by first viewing the attributes of the feature and then pressing Edit from the right soft key menu.

The Edit Attributes page displays the list of feature attributes available to update. For each attribute type, an appropriate data entry control is presented. For example, if a field has business rules associated with it, a drop down list box will display all a list of valid values for that field. By presenting drop down lists instead of simple text boxes, the likelihood of entering an incorrect value is greatly reduced.

Pressing right on the rocker you can navigate between attribute values without

the aid of a stylus. If you press down on the rocker, drop down lists will expand to show all the types that can be set.

The list of fields for which you update attribute values that may be a subset of the fields that you can view in the View Attributes dialog. Your GIS staff have organized the fields that appear in the Edit Attributes Page for your Project.

ArcGIS Mobile

Edit Attributes

COMMENTS

DR SIDE DOOR SPRAY PAINTED

LOSS

0

DAMAGE_VALUE

100

Date_Reported

Thursday, September 20, 2001

Abernathy

Newcombe

Willes

Smith

Jones

Newcombe

Finish

Cancel

A business rule was set up here to limit which names can be legitimately entered into the employee field.

Once you are finished setting attribute values, press the left soft key to Finish updating the attributes and return to the work list. If you determine that you do not want to update the feature attributes after all, press Cancel.

Deleting Features in Your Work List

If the feature in the list is editable, you can delete it by clicking Delete Feature from the Menu soft key. Delete will prompt you for confirmation that you really want to delete the feature.

Delete Feature Confirmation

?

Are you sure you want to delete this feature?

Yes

No

Once you click Yes, the feature will be permanently deleted.

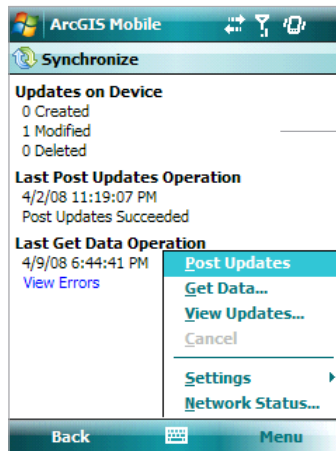
Sending and Receiving Updates

7

The features that you have collected, updated, or deleted in the field ultimately need to be synchronized back to the Server. In addition, it is often critical when working with others to be able to refresh features that others have been creating and updating. Using the Synchronize task, you can both send updates to the server and receive updates that have been posted by others to the server.

The synchronize page displays the following status information:

- Total number of features that were created, updated and deleted on the device since the last time you synchronized
- Date and Time that you last synchronized with the server broken down by posting and receiving requests
- A synchronization log listing all failed posts or “gets” from the server.
- Indication of active synchronization that may be in progress on the device
- Access to Current Network Status



The Synchronize Page provides details about server communication.

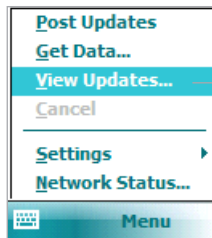
Posting and Receiving Map Data from the Server

The process of posting your updates to the server and the process of getting new features from the server are distinct. If you are working with a large amount of map data, it is important to provision that data onto the device prior to leaving the office. That will alleviate the need to get a lot of data wirelessly from the server. Synchronization over a cellular or WiFi network can be quite expensive and slow, so you should minimize what and how much information you synchronize.

Post Updates

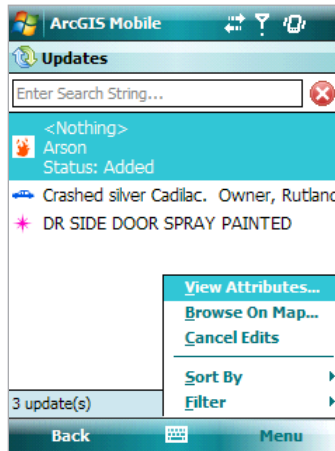
Getting the information that you collect and update on your mobile device back to the server in a timely fashion is critical for many organizations. Using the Synchronize task, there are several options for how and when you can post updates back to the server. Primarily the post process is a manual one—you determine when you will send updates back to the server. From within the Synchronize task you can send updates by clicking on Post Updates from the Menu soft key. All updates that have been made on the device since the last post request will then be synchronized with the server.

Before you post your updates, however, you can review them using the View Updates page by clicking on View Updates... from the Menu soft key.



View Updates gives you a final chance to review your changes before uploading to the server.

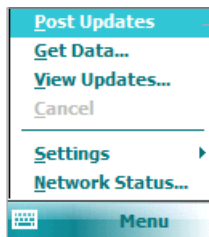
The View Updates page displays each feature that has been collected, updated, or deleted since your last successful posting.



The results seen can be worked with like other search results.

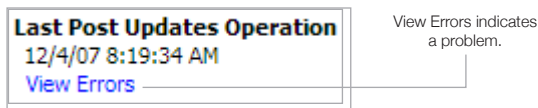
Similar to the Search Results and Work List task pages, the View Updates page presents a list of features for which you can view or browse the attributes. In addition you can cancel edits for any highlighted feature. This will clear all changes that have been made to a specific feature and restore it to its original state. If you choose to Cancel edits on a feature that you have added, it is removed from the device.

After reviewing all the features that you have collected, you can start the synchronization process and continue to work with the application. To post your updates, click Post Updates from the Menu soft key located on the Synchronize task.

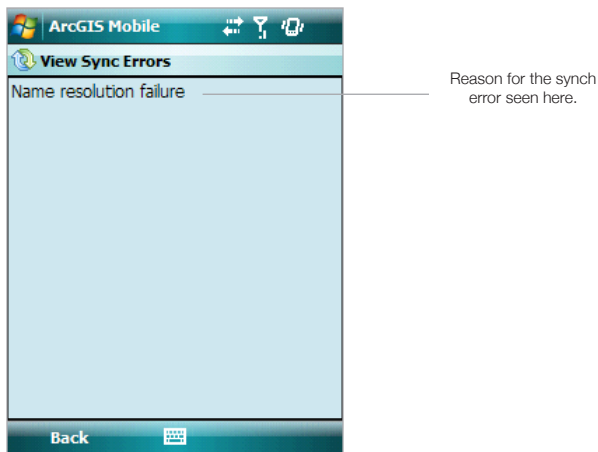


Click Post Updates to begin the wireless sync.

When the post is finished, the Status Page will update with the Date and Time and an indication as to whether the post was successful. If it was not, a link will appear that you can open by tapping on or pressing down on using the rocker.



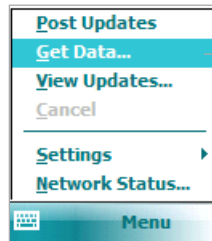
The Sync Errors page will provide you with a list of meaningful error messages that should lead to the discovery of why the synchronization failed. If an error persists, contact your system administrator or field supervisor.



Getting Data from the Server

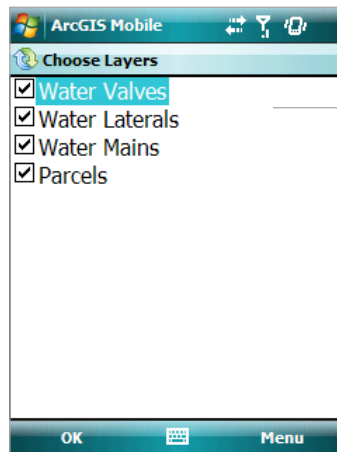
When working with others on field projects, it is often necessary to get updates that others have posted from the server since you synchronized with it last. The Get Data wizard walks you through the process of retrieving updates from the server in order to minimize the time required for synchronization in the field.

To get updates from the server, click Get Data... from the Menu soft key.



Get Data... Command pulls data into the device from the server.

When you click on Get Data..., you are prompted to choose which map layers for which you would like to get new data. If for example, the field project you are working on involves updates to water valve status, and that is the only layer that is being updated, it is recommended that you request updates from the water valves layer only. This will minimize the amount of data that needs to be pulled from the server.



Choosing which layers to update from the server.

Once you have chosen the layers from which you want to get data, press the Next soft key to choose the refresh area you are interested in. You can retrieve data for:

- The entire map
- A distance from your current location
- An area that you browse to using the map

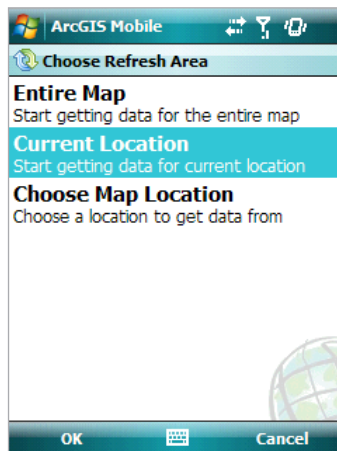
When you request data from the server, it will replace all data for the area chosen in the extent chosen. So if you are planning to request data for a large extent or the full extent of the map, it is recommended that you do so when you have a good connection to the Server (via LAN or WiFi).

If you do intend to pull map data from the server from the field, you can optimize the way that you get data by either specifying a distance from your current location or by choosing a map location by browsing to the map extent you are interested in.

Current Location

If you have arrived at the location that you need to perform your collection or inspection tasks and need to get data from the server, you can use the Current Location option and specify a linear distance measurement to retrieve data from the server.

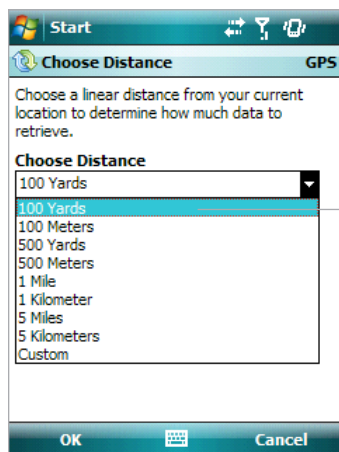
Move the directional pad on the rocker to highlight Current Location and press down to set a distance measurement and start the get data request.



Choosing an extent will determine how much data gets downloaded from the server.

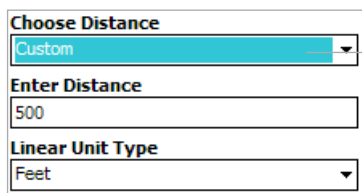
When you select Current Location, the application will attempt to start the GPS receiver that is attached to your device to determine your current location. If a receiver is not located or if no fix can be acquired from the connected receiver, you will be notified and can choose to use the current map location or cancel the request to get data.

The next step is to choose a distance measurement from your current location determined by your GPS receiver.



Choose the distance from
he current location.

If you choose Custom, you can type a distance value and choose a unit of measure that best suits your work environment.

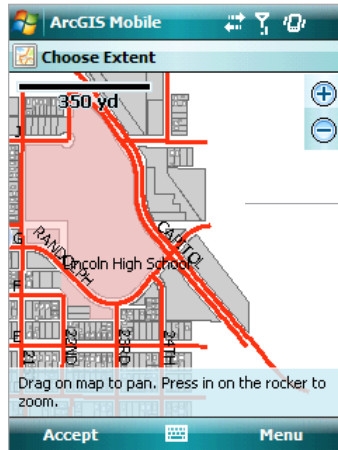


Choose a custom distance.

Once you set a distance measurement, press the OK soft key menu item to start the request to get data from the server.

Choose Map Location

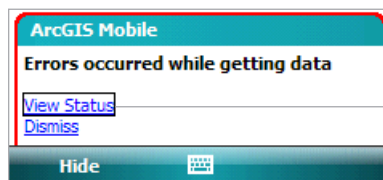
If you already have base map data, you may want to browse the map and for the appropriate location to get data from the server. Clicking on Choose Map Location, the Map Page will appear and you can zoom in, zoom out and pan to the extent for which you need to get data.



Pan and zoom around the map to choose your extent.

Once you have set the extent you need, press the Accept soft key to start the Get Data request. Depending upon the amount of data requested and the speed of the network connection, requests may take considerable time to complete. Once the request has started, you can continue to work with the application. The download will continue in the background.

If you are viewing a page other than the Synchronization Page when the request finishes, you will receive notification that it is complete. Either dismiss the message or view its status. Viewing its status will return you to the Synchronization page.



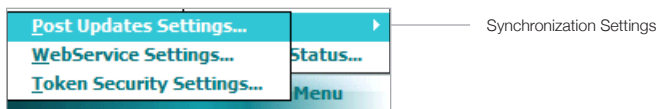
Synchronization status notification

Changing Synchronization Settings

There are three types of synchronization settings:

- Post Updates Settings
- Web service settings
- Token security settings

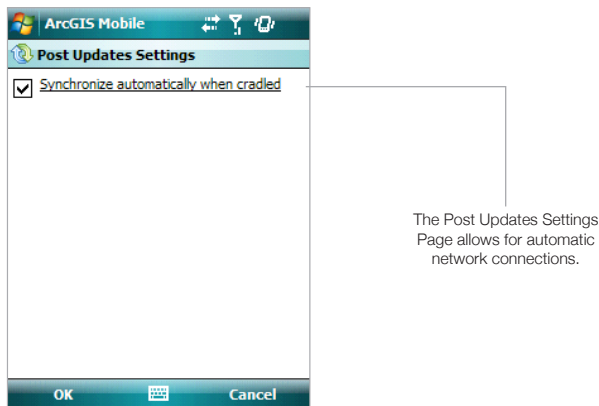
To access the synchronization settings, open the Settings pull-right menu located on the Menu soft key.



Changing the Post Updates Settings

Quite often work done in the field occurs out of range of any network capability. In addition, some mobile devices do not contain cellular or WiFi capabilities. In these situations, the most common workflow is to connect the mobile device to a desktop or laptop computer that has a network connection and use a desktop passthrough mechanism via Microsofts' ActiveSync or Windows Mobile Device Center for Windows Vista to enable network access for the mobile device.

Windows mobile devices can detect when they are cradled and when they receive network access. The post updates setting allows you to set up automatic synchronization when that connection is made.



By checking this option, each time the device is cradled; all updates will be posted back to the server automatically.

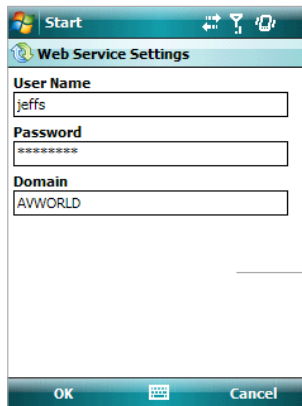
Synchronizing With a Secured Server

The map data that you use in the field, and the information that you capture when working in the field, is extremely valuable and often sensitive information. Often organizations need to secure the way that map data is accessed and will require that you identify yourself before retrieving or posting updates.

There are two ways that your administrator can secure the server:

- Secure web service access using a login account
- Secure web service access using tokens

The Web Service settings page appears when the service used to synchronize map data is secured using credentials. When attempting to synchronize with the server, you may be asked to provide a user name, password and domain. If you do not know the information necessary to connect to the server, contact the person responsible for setting up your field project.



Accessing the Web
Service Settings

The account information entered will be used whenever you send a synchronization request to the server; you do not need to set it each time. Once entered, the information will be saved into a .sync file located in your project folder. If the login information changes on the server, you will receive an error during the synchronization process that indicates that you need to reset the username and password. If this happens, simply re-enter the user name and password to continue.

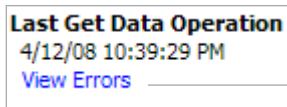
A second method of securing data communications is to use tokens. Tokens include a user name and password just like credential security. The difference is that the user name and password can be re-issued from the server quite easily, often with a limited life span. If your project extends over a longer period of time, you may be asked to provide a user name and password to authenticate yourself.



Token Security Settings allow for additional security measures.

Using Error Logs to Diagnose Synchronization problems

The Synchronize Page displays the date and time and current status of information posted to the server (Post Data requests) and *from* the server (Get Data requests). If a request fails, a link appears beneath the Date and Time information that you can click to get more information about why the request failed.



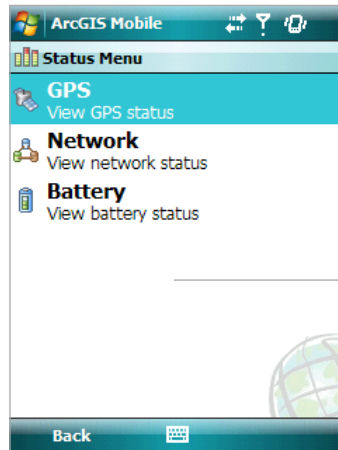
Click here to get additional information about errors.

Clicking on the link will open the View Sync Errors page. On the View Sync errors page, you are given detailed information that will either be device or settings related, or possibly a problem on the server. A common error is “Cannot connect to the server”. This obviously happens if you lose your network connection. Check your method of connectivity (WiFi, Broadband, Ethernet) and make sure you have a valid connection.

Accessing Device and GPS Status

8

There are a number of settings for which you may need to get status or change based upon environmental conditions, location, and the state of your hardware. Using the Status task you can view the current state of your GPS, turn on or off your connection to the GPS receiver, or set the COM port and baud rate for the connection. You can also view the status of your connection to the network and the current state of your battery.

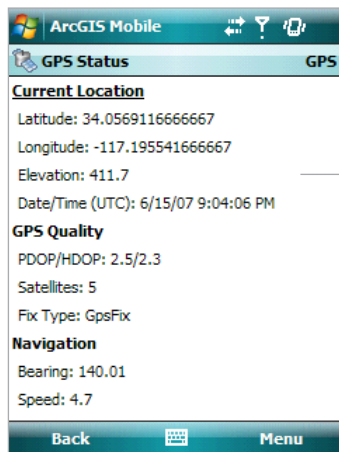


The status menu provides access to realtime GPS, network and battery details.

Connecting and Accessing Status of Your GPS Receiver

The GPS Status page is where you connect and disconnect your GPS receiver, establish the connection settings for the receiver, and view the status of positions that are being read from the receiver.

From the GPS status page menu, you can toggle on or off the access to a GPS receiver and receive status on the quality of the GPS connection.



The GPS Status page

GPS status is organized in three categories of information:

- Current Location
- GPS Quality
- Navigation

Current Location

Using the current location status, you can view the latitude, longitude and elevation values that are being received. This may be useful in comparing your current location with your map location. You can also view the current time received from the GPS receiver in UTC time. GPS time can be used not only as an accurate measurement of time, but also as a means of transferring time from one location to another.

GPS Quality

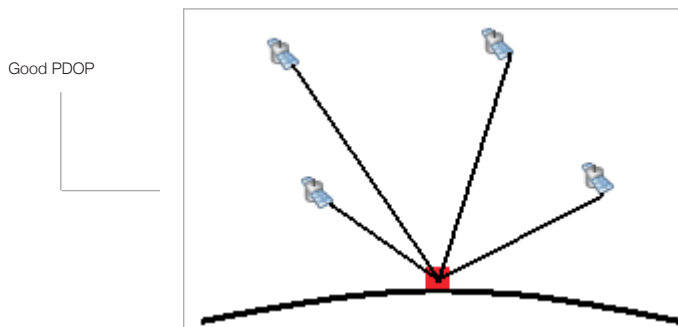
The quality of the GPS signal that you are receiving is important whether you are simply estimating your current location on top of the map or if you are collecting GIS feature shapes.

There are several factors that can influence the quality of a GPS position re-

ceived, including the quality of the GPS receiver being used, your current location and environmental conditions, atmospheric conditions, and much more. The GPS Quality settings listed in the GPS Status page will provide you with important indication of the quality of the positions you are receiving—PDOP and HDOP.

DOP stands for Dilution of Precision. It is a measure of the position of the satellites: how many you can see, how high they are in the sky, and the bearing towards them. This is often referred to as the satellite geometry. As the satellites move, their geometry also changes. A low DOP value generally indicates a higher probability of accuracy.

DOP is divided up into components because the accuracy of the GPS system varies. PDOP is the positional dilution of precision. The best PDOP would occur with one satellite directly overhead and three others evenly spaced about the horizon. The value would be one.



GPS collection settings use PDOP and the GPS Fix Type as a GPS quality filter. If positions do not meet the quality filter settings, they will not be used in the averaging process.

HDOP is the horizontal dilution of precision and is an error estimation based upon the dispersion of satellites across the horizon.

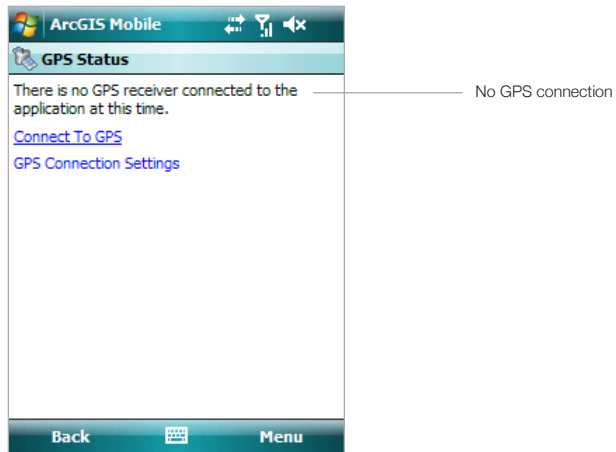
As an overall guideline, with PDOP and HDOP values between 2 and 3, positional measurements are considered very accurate; 4 to 6 are good but mark the minimum appropriate for simple data collection and navigation; 7 to 8 are moderate and can be used for simple map navigation but not recommended for data collection, values 9 or higher indicate that the positional accuracy is very poor and GPS navigation or collection should be avoided.

Navigation

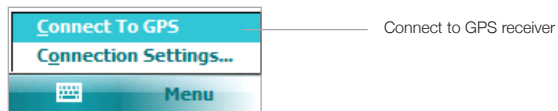
GPS navigation properties can be used to indicate your current heading and speed. This may be useful when using GPS in navigation of the map. Bearing is based upon the last position received and distance is measured in MPH.

GPS Connection

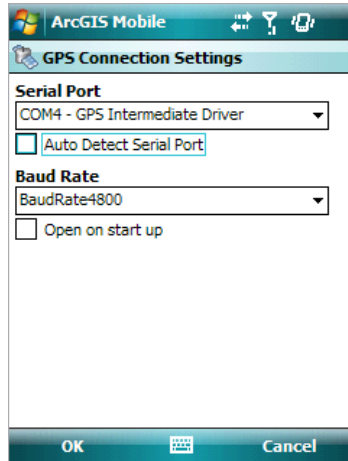
If you do not have a connection to a GPS receiver, the GPS status page will direct you to connect to a GPS device given your current settings.



From the Menu, click 'Connect To GPS' to connect to a GPS device given your current connection settings.



If you are using an external GPS, such as a Bluetooth GPS, you will need first to pair that receiver to the mobile device. In doing so, the device will be paired to a COM port that you then specify in the GPS connection settings of the ArcGIS Mobile application.



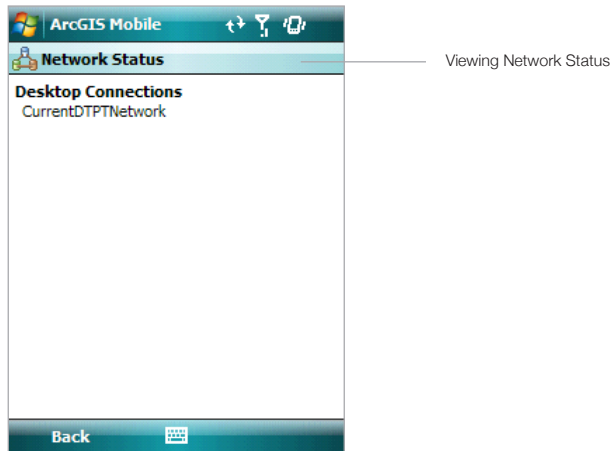
GPS Connection Settings

By default, the GPS connection settings page loads with the settings that were set for your project. However, you can change the connection by specifying a serial port or by using the Auto-Detect method of locating a COM port, and also the baud rate for the connection if that information is known.

Viewing Network Connections

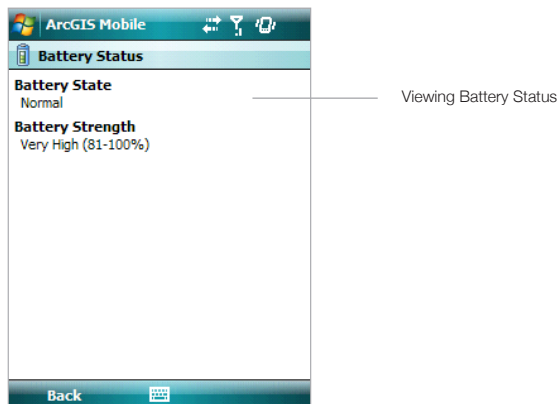
Knowing when you are connected to a network is critical if you plan to synchronize data between your mobile device and the Server. It is also important to know what type of connection you have so that you can optimize how much information you will synchronize. Network status is available from the Connection Settings on the device, but it is often difficult to navigate between applications inside of Windows Mobile, so the application provides a direct means of doing so.

The Network Status page provides you with the current state of your network connection.



Viewing Your Battery Status

Knowing the state of your mobile device is extremely important when working in the field, and perhaps nothing is more critical than knowing the battery life of your device. Using a GPS device, Bluetooth and even the phone network can quickly drain your battery. Some devices offer a primary and backup battery as well. Knowing the current state of your battery will help you in making usage decisions in the field.



The Battery Status page displays a list of the batteries that are contained within the mobile device and their strength.

Battery states listed include:

- Normal (battery is in a normal operating state and is most likely fully charged)
- Low (battery state is low and if you do start charging soon may reach a critical state)
- Critical (battery state is critically low and when strength reaches very low ArcGIS Mobile will shut down)
- Not Present (the battery is not present indicating some form of failure)
- Charging (device may be cradled and is currently being charged)

Battery strengths listed include:

- Very High (strength is 81 – 100%)
- High (strength is 61 – 80%)
- Medium (strength is 41 – 60%)
- Low (strength is 21 – 40%)
- Very Low (0 – 20%)

If the battery strength becomes “very low”, you will receive a notification that, when the battery state reaches a “critical state”.

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