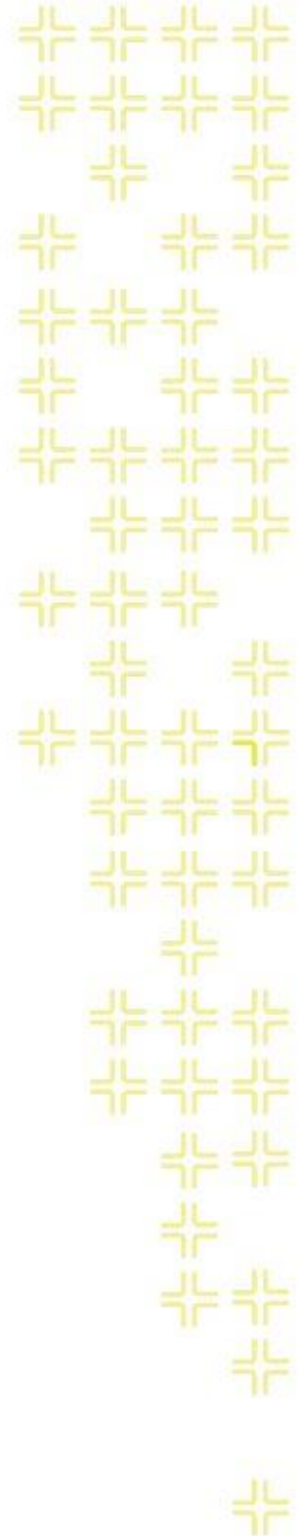TRAINING GUIDE

Tablet: Cradle to Mobile
GIS

Tablet Cradle to Mobile

One of the critical components of mobile is the GIS piece, and also can be the most complex. The mobile GIS maps are designed to consume the same maps that are defined for use on Lucity Web.
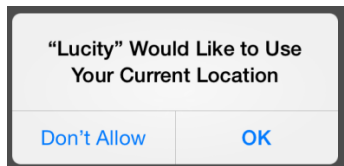
Contents

GIS in iOS

GIS from the Dashboard

When GIS is launched from the dashboard it opens the map to the last used map in the last extent. The first time the map is opened, users may get a prompt for whether to allow Lucity to access the user's location:

If don't allow is selected, the GPS zoom functions will not work. The option selected is remembered and the system does not prompt again. To make changes to whether Lucity is allowed to access the device location, go to Settings on the iOS Device, go to Privacy, and select Location Services.
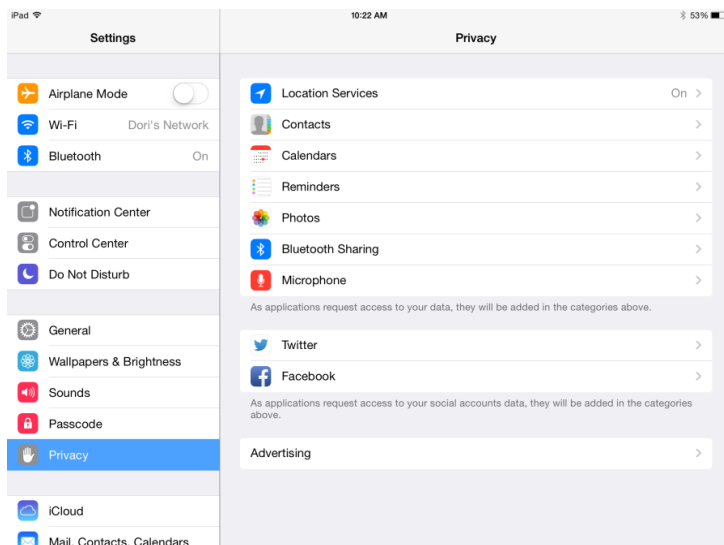
Find Lucity in the application list and toggle on or off the location services permission as desired:
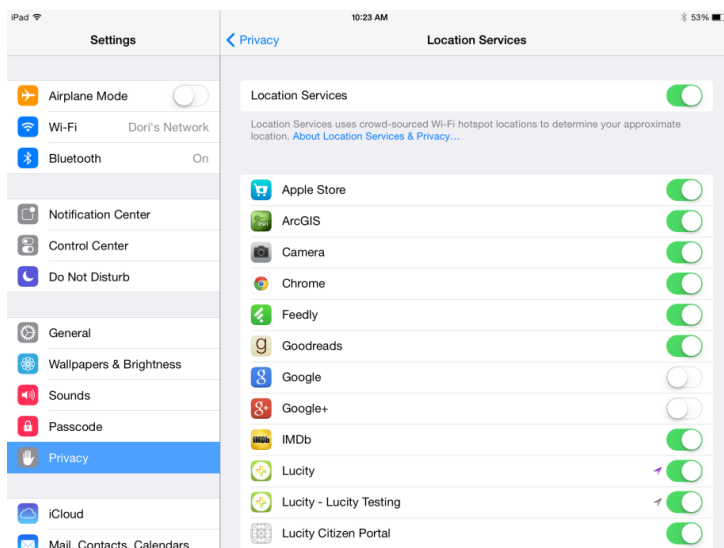
Once in the map, the navigation button in the upper left will return to the previous screen (which will be the dashboard for this scenario).

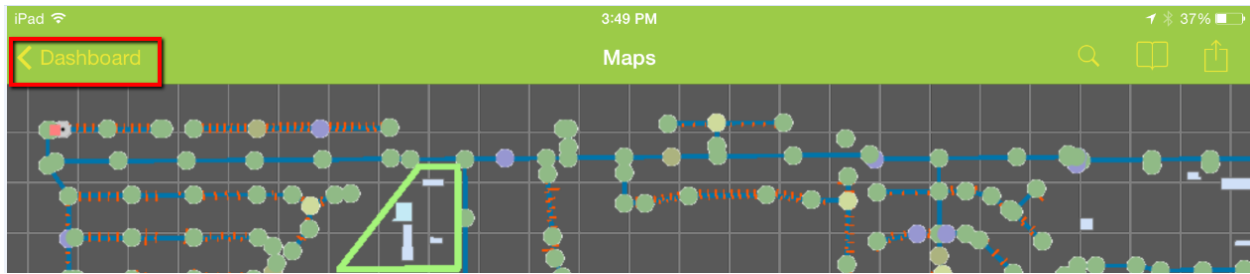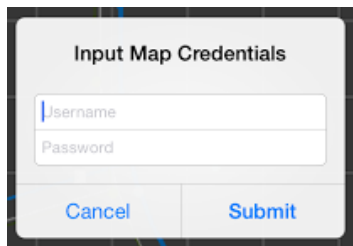There are 2 toolbar areas and a menu in the map. Several of the toolbars open panels with more options. In the iPhone, there is only one toolbar area (at the bottom) and a menu.

If a map has any secured services that do not have credentials pre-configured in Lucity Admin, the user will be prompted to log in when the map is opened.

The map will prompt for the secure credentials for each layer but will only prompt once. Subsequent map opens will use the saved credentials. If you log out of the app or close it (by restarting the device or killing the running app), the credentials are cleared and the user will be required to re-enter them.

Viewing and Changing Map Information

The very first time the map is opened, it will attempt to use the map that is configured by default for the user. It is common to want to use an alternate map while in the field. This can be done by selecting the alternate map within the tablet. The tablet will remember the alternate map for the user logged in.

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Tablet Cradle to Mobile - GIS
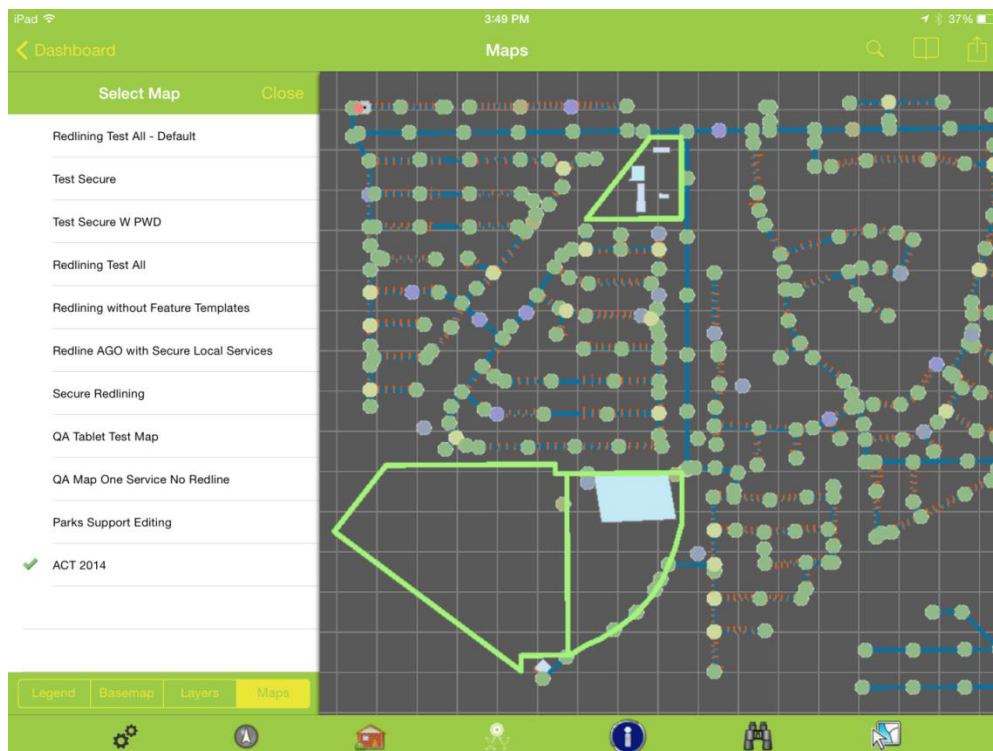
Changing maps

To change the map, click on the Maps Panel button 🔧. This will open a panel on the left hand side (or full screen for iPhone).


There are 4 sections in the map panel: Legend, Basemap, Layers, and Maps. Go to the Maps tab. All available maps will be listed. The currently loaded map is checked with a green checkmark.

Tablet Cradle to Mobile - GIS

To switch to a different map, select the alternate map in the list. The map will immediately redraw. The application will remember the new map selected for the next time the map is opened.

Changing the Base Map

To change the base map, select the base map tab. The existing base map will be selected. Tap a new basemap to select it. The change is effective immediately.
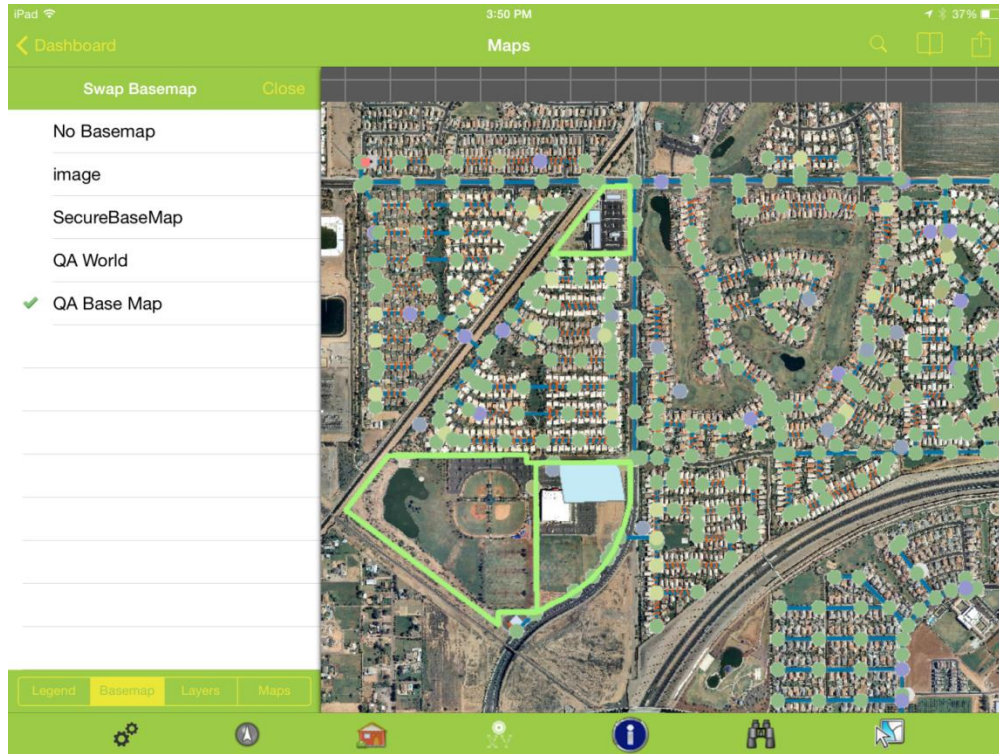

If the new basemap is in a different spatial reference than the original map, the map will zoom to the full extent. It is best if all base maps share the same spatial reference. For compatibility with Esri ArcGIS Online applications, using Web Mercator is a good idea for base map deployment.

The new basemap is remembered so that when the map is re-opened, it will use the newly selected basemap.

Turning Map Services On/Off

The application does not allow turning off individual layers in a map service, but it is possible to temporarily turn off an entire map service on the layers tab.
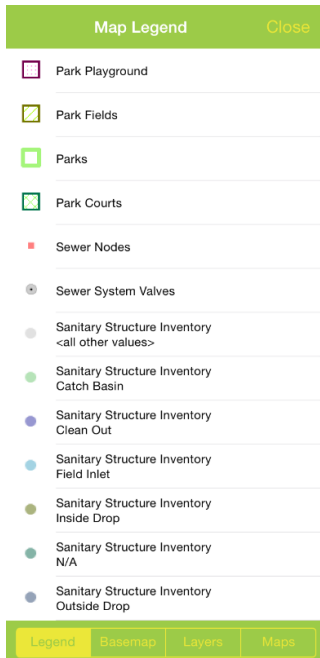
When the map is reopened it will reset the layer visibility.

Tablet Cradle to Mobile - GIS
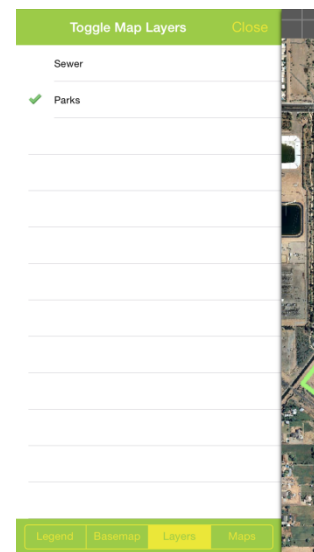
Legend

A legend is available for the map as well. It is accessed on the Legend tab of the map panel.

Show In Map

The Show in Map function is available for many modules and can work on one or more selected records. By default it will first try and find assets. If it does not find any assets on the selected record, it will plot points and addresses.

Performing a show in map will plot the feature and label the feature based on the configured display field for the layer.

Configure the display field in ArcMap before deploying the service so that you don't also end up with OBJECTID as the display field as shown above.
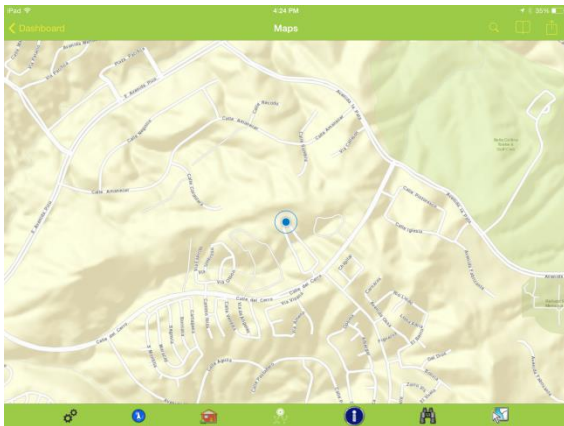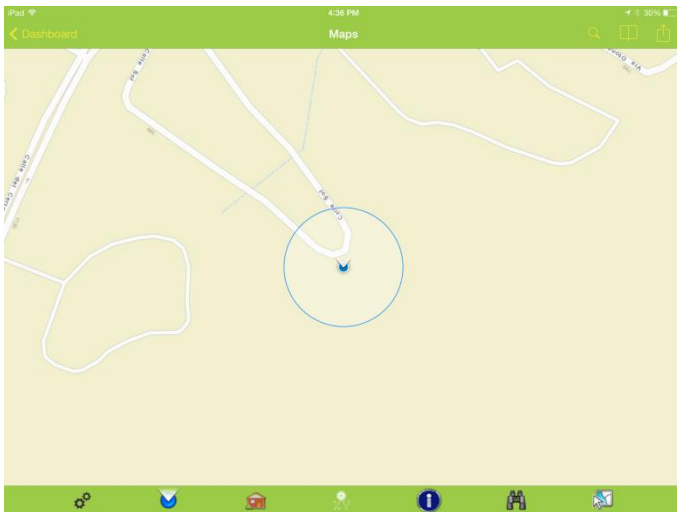
Map Navigation

Zooming and Panning

The map supports drag pan navigation, flick pan navigation, and pinch zoom.   Double tapping the map zooms as well. Double tapping zooms in centered on the current extent; it does not zoom in to the spot you double tap.

GPS Location

The map has a GPS location tool which will zoom and plot the current location if location services are enabled for the Lucity app. Click the ⬥ to activate the GPS. The map will display a blue dot with a blue circle around it to indicate the current accuracy of the position. As you drive or move the map display will automatically pan to keep the current location within the extent.

Click the GPS button again ⬥ to change to a heading mode which will show the location and compass bearing.
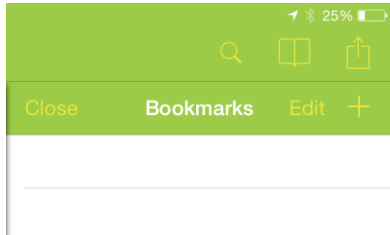

To turn off the GPS, click the GPS button ⬥ again, which will change it back to grey and turn off the GPS location.
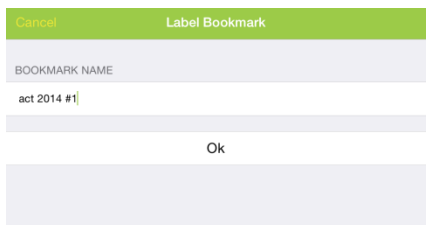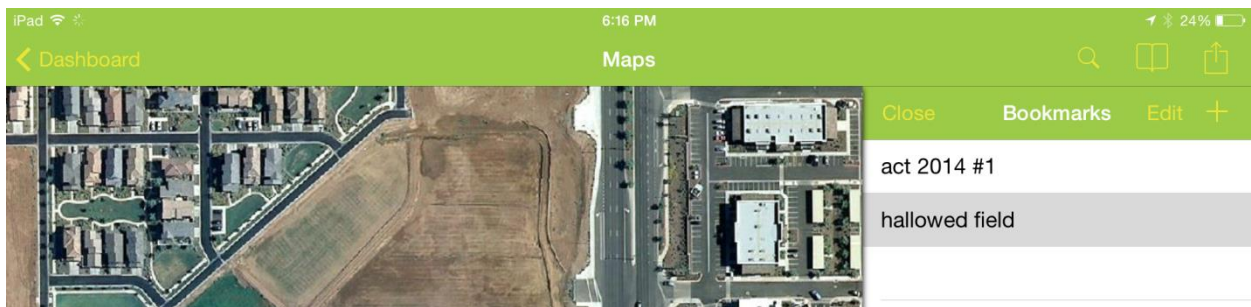
Tablet Cradle to Mobile - GIS

Bookmarks

Bookmarks are an easy way to save an extent of a map to get back to it easily. The Bookmarks panel is accessed from the upper right toolbar . This opens a panel displaying all of the existing bookmarks.
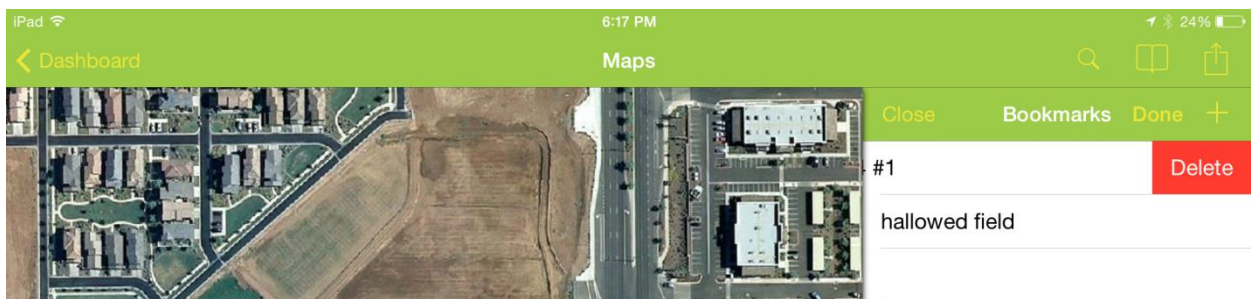

To add a bookmark for the current extent, click the "+" and give the bookmark a name.

To zoom to a bookmark, select it from the list.

Book marks can be deleted by swiping the bookmark entry to the left.

They can also be deleted by clicking the edit button, then clicking the red minus and click delete. Click Done to exit edit mode for the bookmarks

Searching in the map

Searching for Addresses

To search for an address in the map, click the search button in the upper right toolbar 🔍
This opens this search bar:
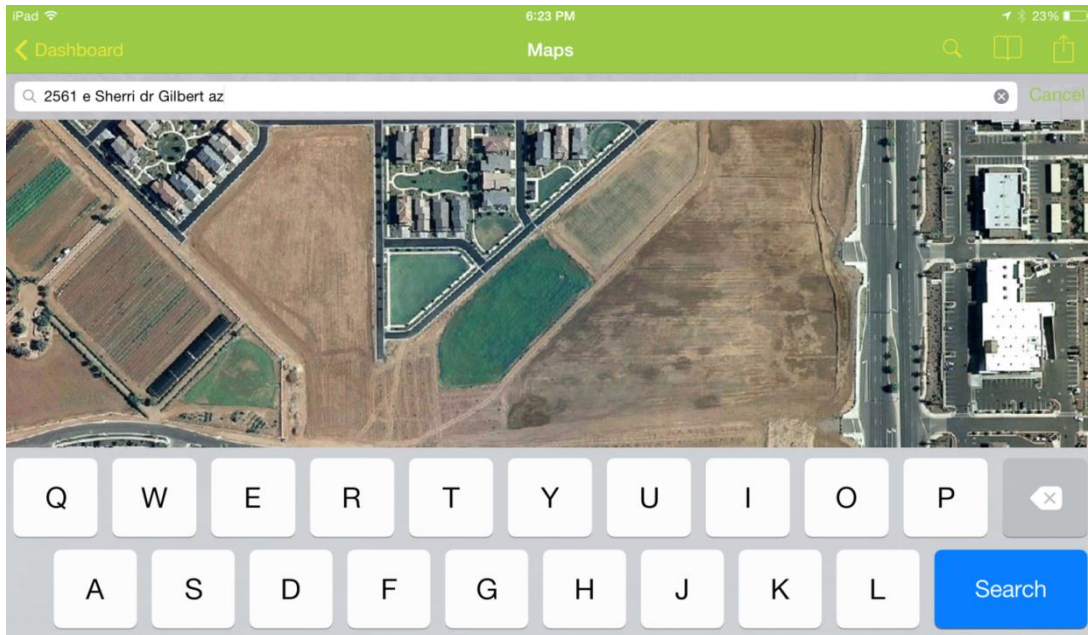
Tap into the search area and type the address and click Search. If the address is found, a green dot will be placed on the map at the calculated address location. Tap on the dot for more options including driving directions, creating a request for the selected address, and creating a work order for the selected address.

Notice in the following case it did not find an exact match.
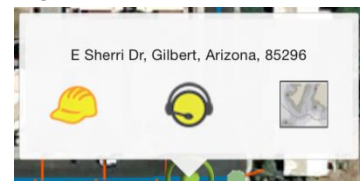
This address search will use your custom geocoder. It works best if you are using a geocoder that is at 10.2.2 or later. If you are still on ArcGIS Server 10.1, you may need to temporarily switch to the Esri geocoder http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer until you can get upgraded to a more recent ArcGIS release.

Driving directions 🗺 will open the Apple Maps app and show driving directions from the current location (if available) to the searched address.

Tablet Cradle to Mobile - GIS
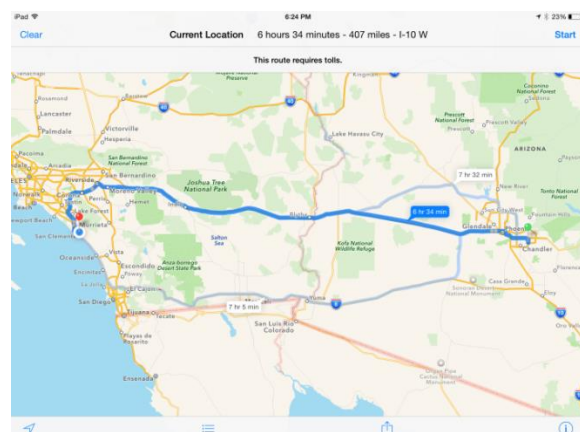
Creating a Work Order will create a work order using the default tablet category and will attach the address as a location on the work order. The following error indicates that the default category for the tablet is not configured yet.
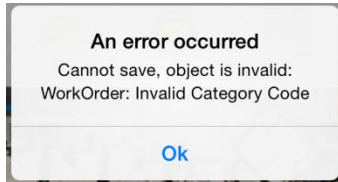
To configure the category, click the menu button and select "Settings".

Scroll to the bottom of the settings form and select a Default Category
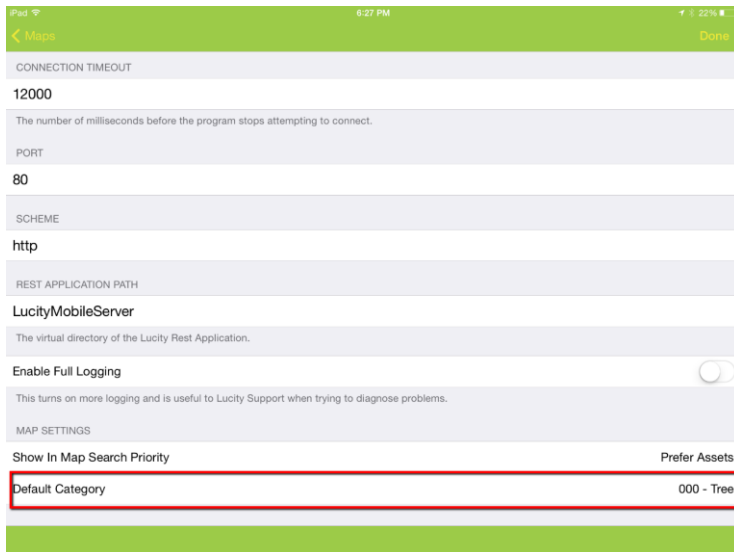
Tapping the category value will open a category prompt

Find the category you want to use as a default for this user on this tablet for this client and tap it to select it.

Tablet Cradle to Mobile - GIS

Now when the work order button is clicked, a work order is created, the address is added to the work order, and the work order is opened in a form.

At this point the work order can be filled in (and category can be changed, if desired). To view the location added to the work order, click the "…" child views button and select "Locations"

The address added to the work order is the located address, it is not the address searched. It is possible that the address locate may not find an exact match, but it will select the closest match. The match returned on the geolocate is what is placed in the work order location field.

The work order is saved to the server before a form is displayed. Navigating away from the work order at this point will not cause the work order to be discarded.

This address does find an exact match. When the green dot is tapped, the address shown is the address that was searched.
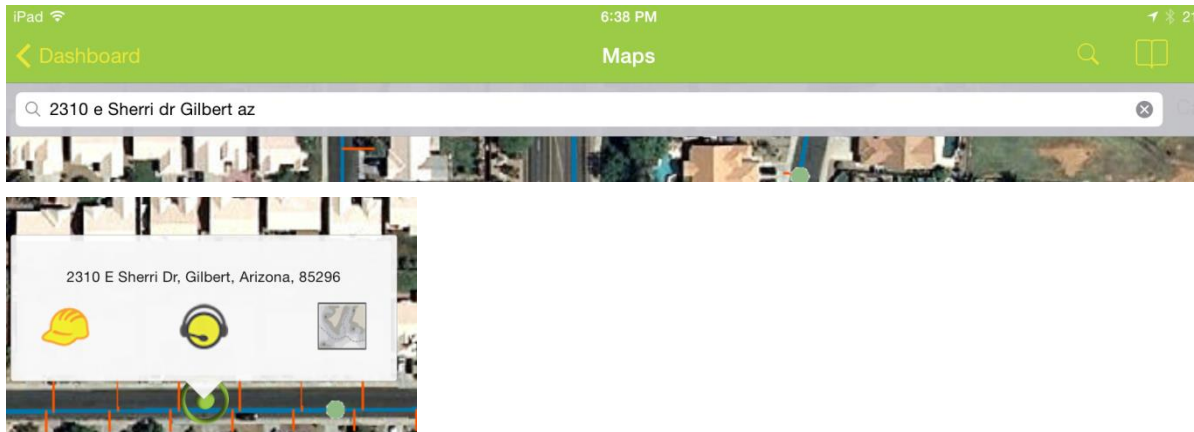

Creating a request from an address search will create the request, default the category, and assign the location address of the request to the address from the search results. The form is opened so that any further edits can be made:

Searching for Assets

The Lucity iOS map application also allows searching for an asset based on full or partial common Id of the asset. To search for an asset, click the Find button located on the bottom toolbar.

If there is more than one operational map service in the map, the dialog will allow you to select which map service the information is in.
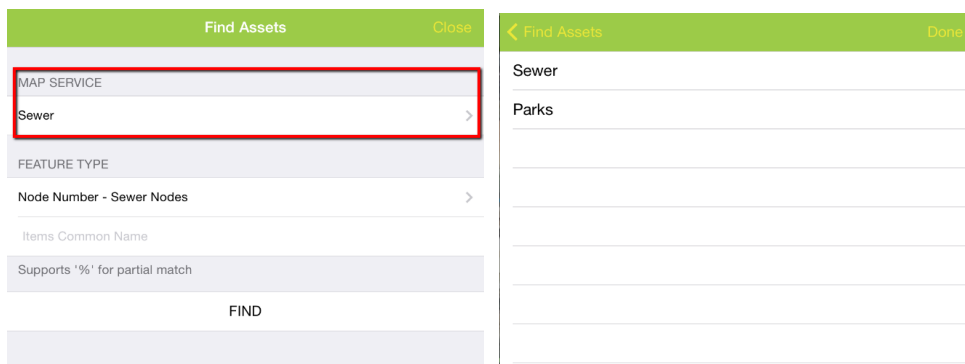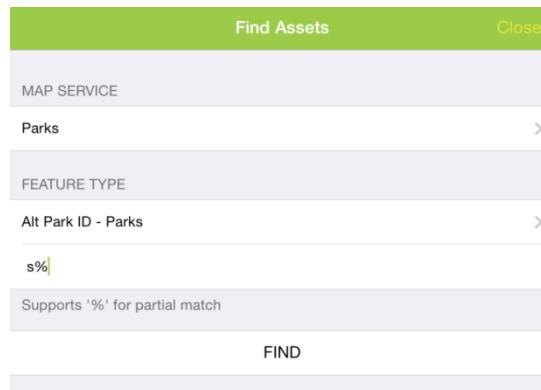

Then select the type of feature to find. The Feature type picklist shows both the common name of the asset type as well as the name of the field in that layer that will be searched.
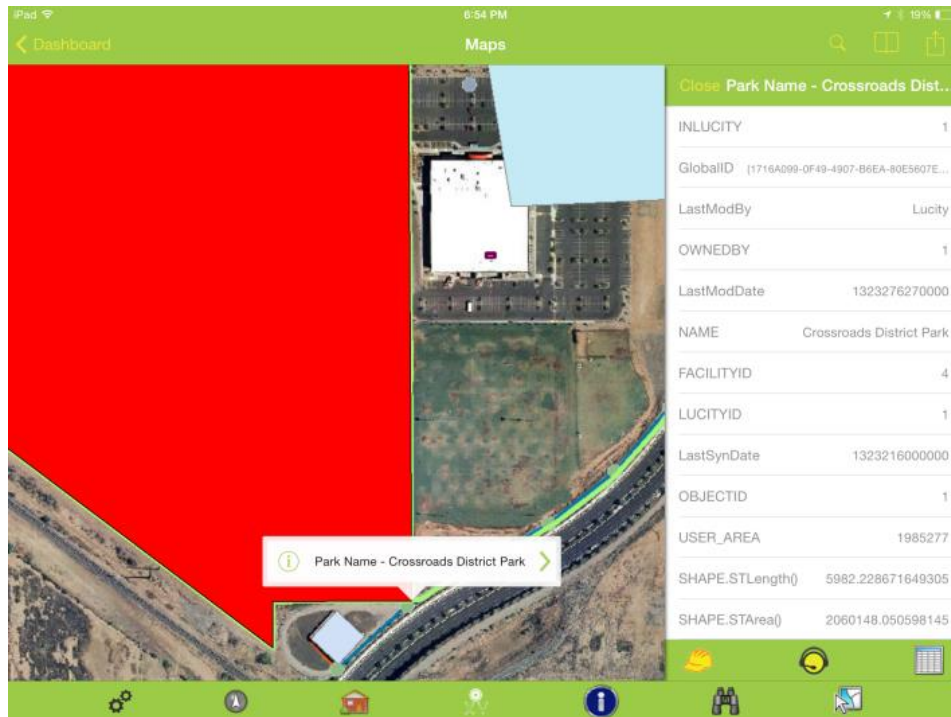
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Enter the text to search for. Include a % as a replacement for any character. For example to search for everything with the name South anywhere in the common id, enter %South%.

Click Find.

If features are found they will be selected and the map will zoom to the first feature.

Tapping on the Arrow will show more features that were found from the search. Tapping the "i" will open the panel and show the details about the item that was found. If the panel is already open, it will update the panel to show details about the currently selected item in the popup.

Selections or graphics can be easily cleared using the Clear Graphics option in the menu
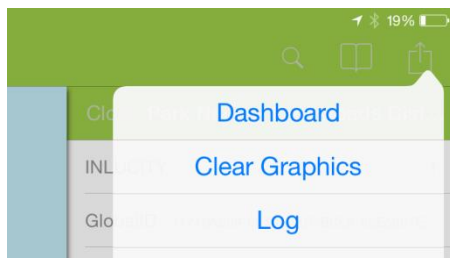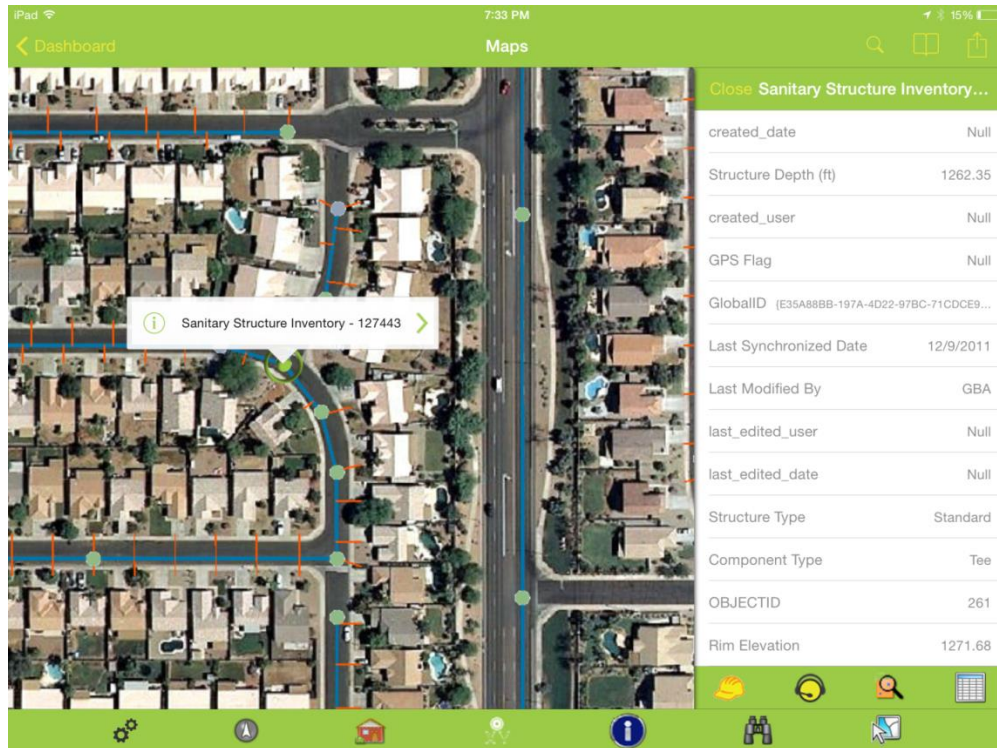
Inspecting and Selecting

To inspect or identify a feature in the map, use the identify button [icon]. When the tool is selected it will have a grey background.

Tap the feature you want details on. This will pull up a popup with the type of feature as well as the display field for the feature. Additionally, a panel will open with the extended details about the feature.


There may be more than one feature at that location. To view other features at that tap point, click the green arrow to pull up a list of all features found. The popup is a scrollable list. Find the item you are interested in and select it from the popup list.
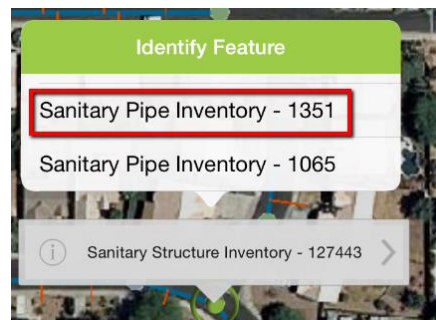
This will change the popup to show the new feature and will select the feature in the map. It will also update the details panel with information about the new feature.

At any time the details panel can be closed.
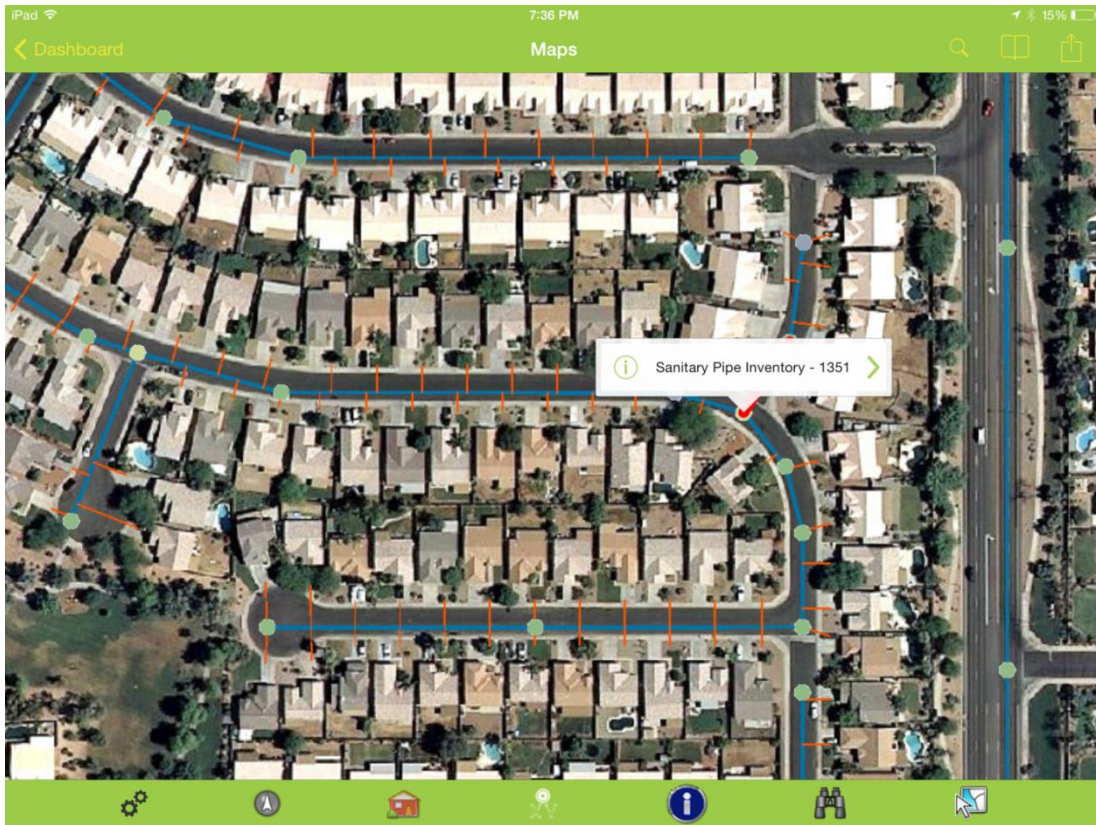
To get it back, click the "i".

The details panel provides a scrollable list with access to all of the attributes deployed for that feature in the map service and provides the ability to create a work order, a request, or an inspection on a feature, as well as view the Lucity feature relationships.

To create a work order for the current feature, click the Work Order button. This will create a new work order and attach the asset to the work order, and open the work order for further edits.

The category for the work order is assigned based on the default category defined in Lucity for the selected feature.

If there is no default category defined, the system finds the first available category in the category list with the correct asset type.

Creating a request works the same way as a work order from the identify dialog. Click the Create Request button and it will create the request for the asset, place the asset on the request and assign a category to the request based on the selected asset. The request form is then opened for any further edits.

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Creating an inspection from the identify dialog will create an inspection for the current feature for the current date and time. If there is more than one possible inspection type, the user is prompted for which type of inspection to create:


The created inspection is opened for further editing in a form.

In all of these actions, the upper left navigation will return to the map to continue working within the map.


Clicking the relationships button opens a panel showing all relationships to the current feature. Clicking on one of the relationships in the list will open a view which contains all of the items for the selected relationship.
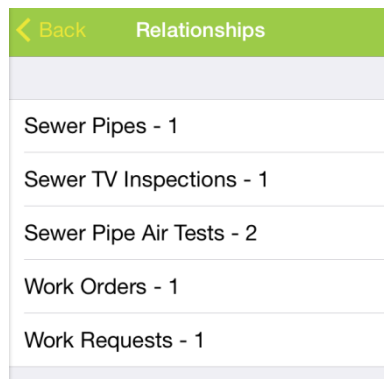
Point to address

One of the other tools provided in the tablet map is the ability to tap a point on the map and have the map attempt to calculate what the address is for that location. To use this, click the ⌂ tool on the bottom toolbar and tap a location on the map. This will bring up a prompt showing the approximated address:
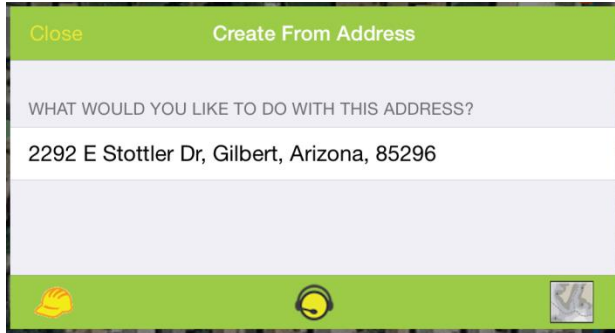
The work order, request, and driving directions tools on this dialog work the same as the address search dialog discussed earlier in the session.
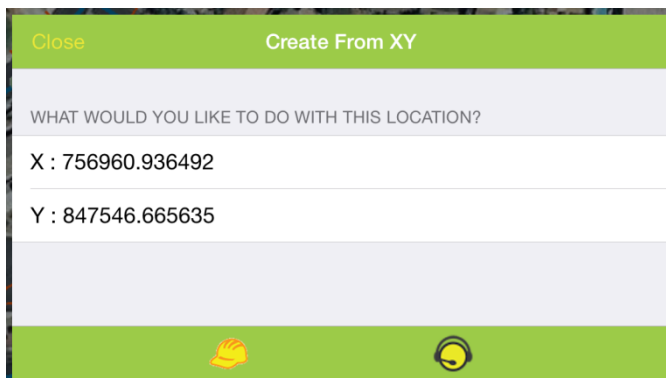
This tool uses only the ArcGIS Online geocoder for the reverse lookup: http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer . It is not possible to customize this.

Creating Requests or Work Orders at a Specified Point

If a work order or request is not being performed at a specific address or on a specific asset, using the XY tool ⊙ is a good way to identify the location of the work being done. Tap the location on the map where the work is. This will prompt for what to do with the specified point.

Creating a work order will create a new work order using the defined default category and add a location record with the specified XY. Creating a request will create a new request using the default category for the user/tablet and will put the XY on the request as the request location.

The coordinates displayed in the prompt are in the local defined coordinate system. This may vary from the map coordinate system. The Lucity mobile application automatically projects these coordinates into the operational coordinate system defined in the system settings.
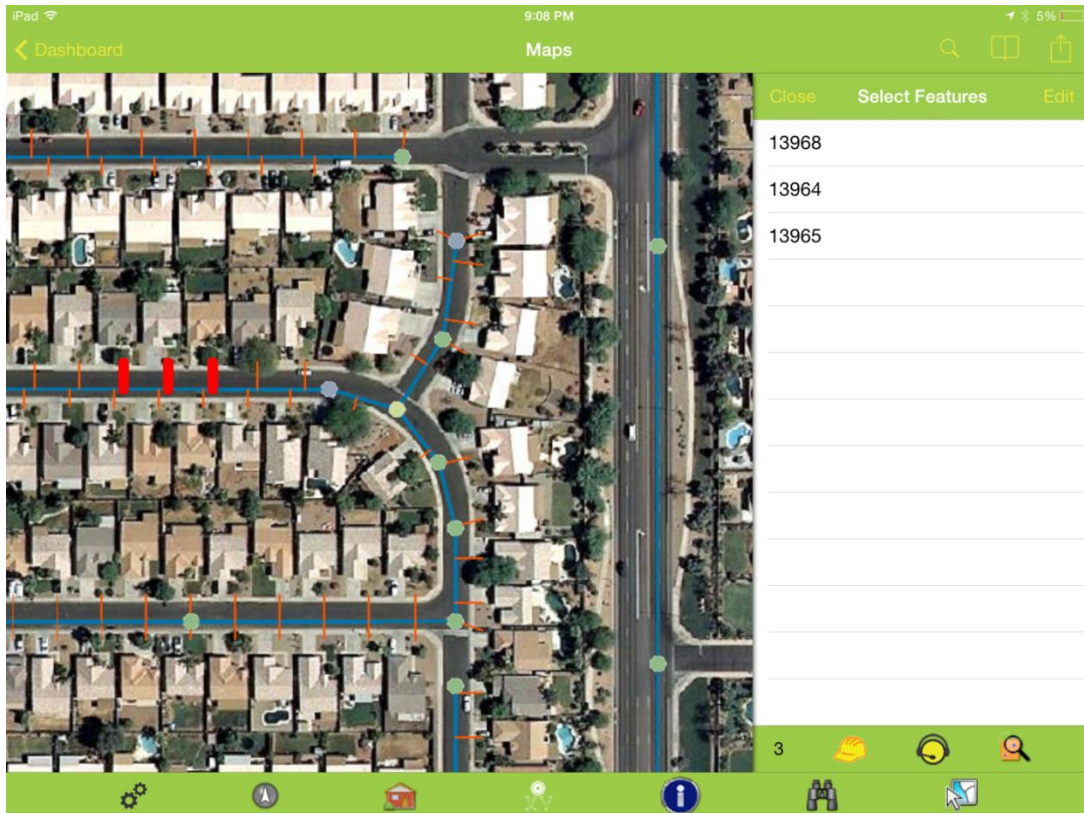
Multiple select

It is possible to select and work with multiple assets at a time. This is done using the [icon] tool on the lower toolbar. The tool prompts for which map service and layer you want to select features from:

Clicking Select returns you to the map to start tapping the desired features to be added to the multi-select. Each feature in the selected layer that is tapped will be highlighted and the identifier will be added to the list of features in the Select Features pane.

Tablet Cradle to Mobile - GIS

To unselect a feature, swipe the identifier to the left in the select features list or click the edit button and tap the red minus. Then click delete.
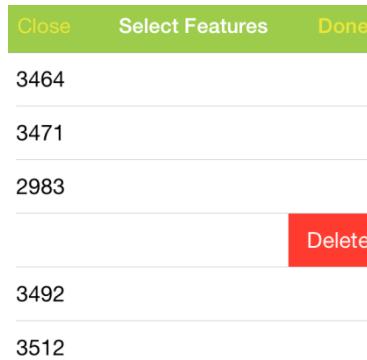

A running count of features is show at the bottom along with tools to create work orders, requests, and inspections on the selected features.

Creating a work order creates one work order and attaches all assets to the work order. The work order form is opened for further editing.

The Create Request function creates one request for each item. The system will prompt and display how many requests were created. No view or form is opened.
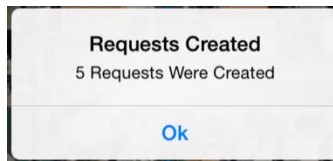
Create inspections will create an inspection for each feature on the list for the current date and time. Some features support multiple types of inspections. These features will have an additional prompt for which type of inspection to create.
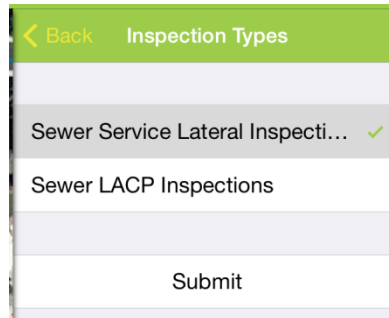
The inspections are created and a prompt is displayed.
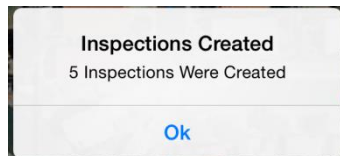
Redlining in the map

Maps can be configured to allow users to redline graphics and make notes directly in the map. Redlining is different than editing because it is not designed to work with Lucity features. It is designed to provide a way to communicate with back end GIS staff or other agency staff about something in the map. Redlining uses feature services with ArcGIS Server or on ArcGIS Online.

Maps which have a layer which is compatible with redlining will have a pencil in the upper toolbar:
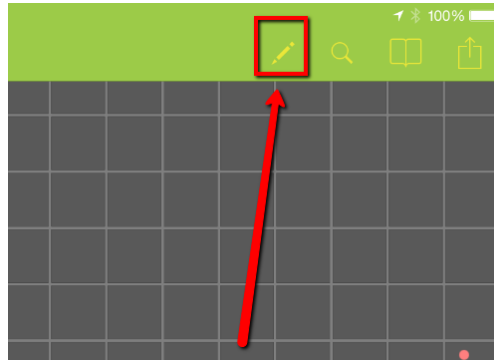
Tapping this tool will open a redline objects panel which displays all available redlining objects that may be added in the map and includes a tool which allows existing redlining objects to be selected at the bottom of the panel.
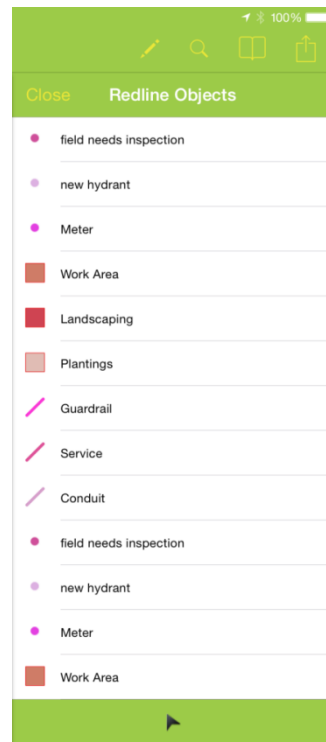
Up to 3 possible redlining layers may be configured for a map; one point layer, one polyline layer, and one polygon layer. These correspond to 3 layers in a single feature service. Within each layer, multiple feature templates or types can be defined. This is done in ArcMap.

This example has 3 layers and each layer has multiple feature templates configured. This is a screen shot of these configured templates in ArcMap. It is not required to use feature templates.
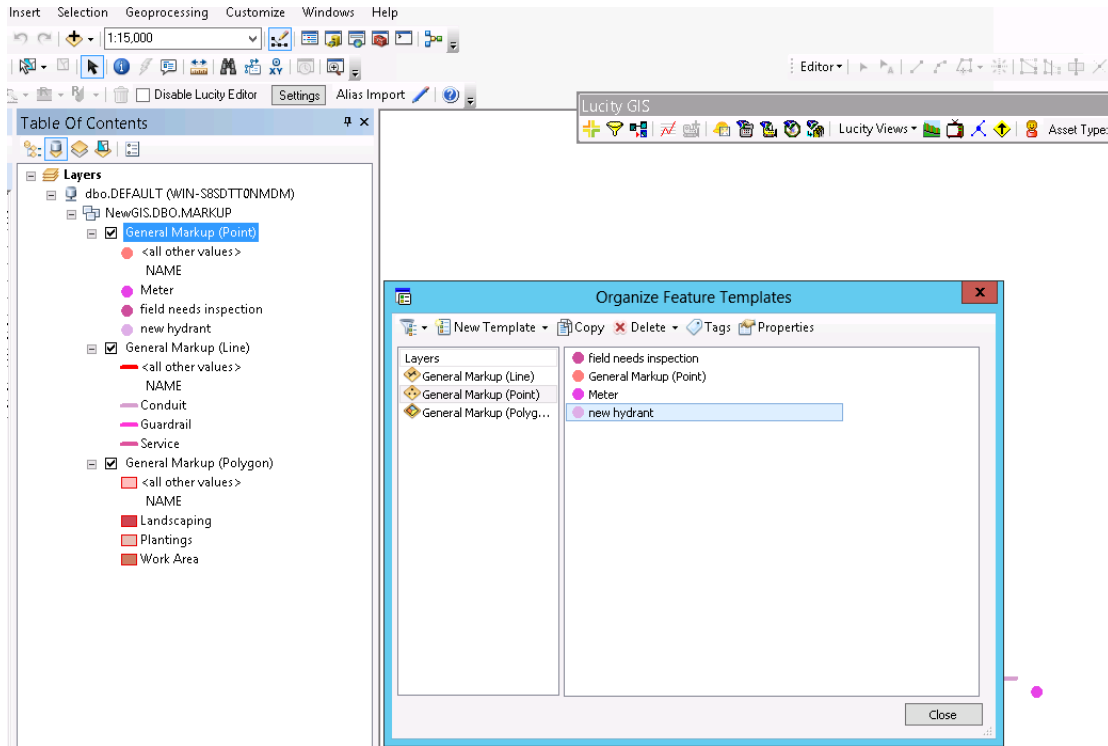
To create a new feature, select the feature from the redline objects list. The application will prompt for attributes for the feature.
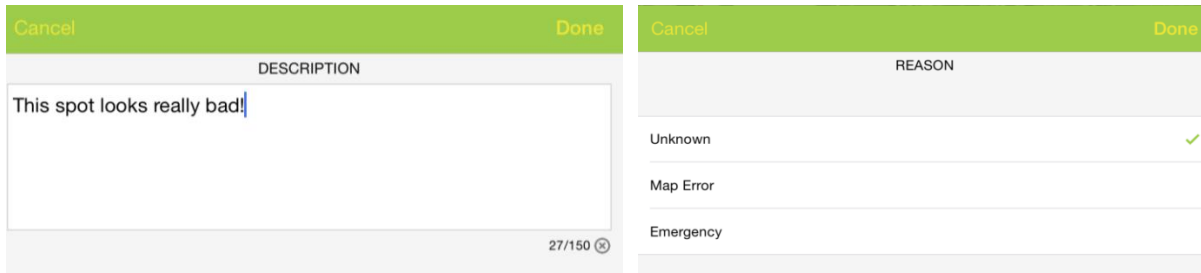
Tablet Cradle to Mobile - GIS

To enter data in these fields, tap the item, enter text or select from the picklist, and click Done.

When done editing the fields, click the draw icon at the bottom of the form
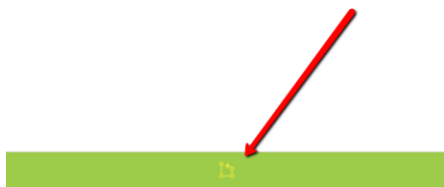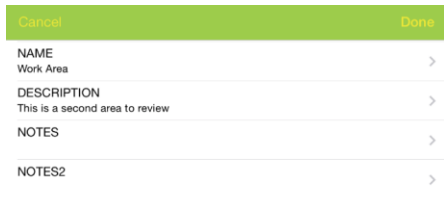
This will redisplay the map and will change the upper right toolbar to add tools which support the current redlining operation.

The map can still be panned and zoomed while in the redlining operation is active. Once the feature is drawn in the map, click the "Save" button to persist it.
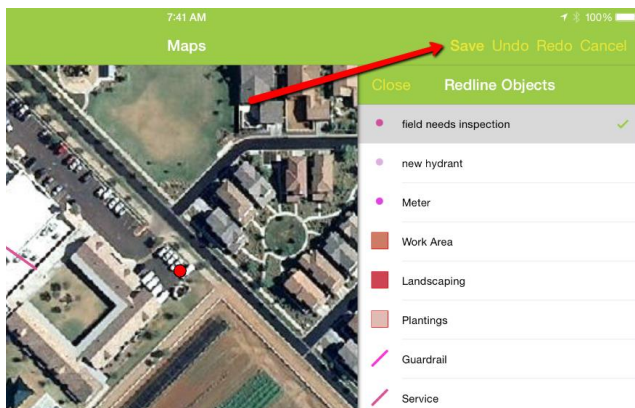
This will show the attribute dialog again for final review. Click Done to close the dialog.

Tablet Cradle to Mobile - GIS

To edit the attributes or shape of an existing feature, use the select button and tap on the feature. This re-opens the attributes dialog so that attribute or feature edits may be made.
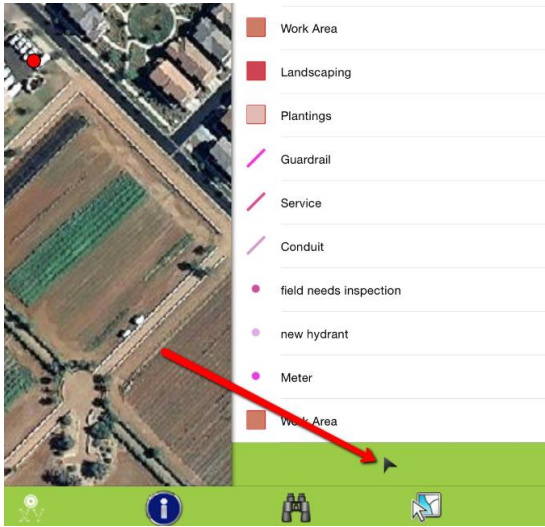
To leave redlining mode, close the redlining pane.

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Tablet Cradle to Mobile - GIS

Editing in the map

Editing is also supported in the Lucity iOS map. Edits made while out in the field are made directly to the Esri geodatabase using feature services. You should not allow users to edit in the field if you are still using the Lucity GIS SOE for your GIS edit maintenance. You should only enable this feature if you have switched to using feature services for GIS edit maintenance.

To enable feature editing, check the "Has Feature Service" checkbox in the Map services setup.

To disable editing on a service in one specific map, check the "Disable Edits" checkbox in the Map setup dialog.

If a map has layers which are editable, an additional icon will be displayed in the upper right toolbar:
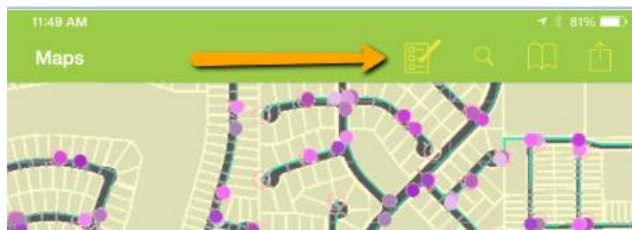

Clicking on this will prompt you for what layer you want to edit. If you have multiple map services in the map that support feature editing, you will first be prompted which service the layer is in.

Once you select a layer, a feature pane will be displayed and it will show all available feature templates for that layer. For the layer I have selected (Water Hydrants) I only have one feature template defined:
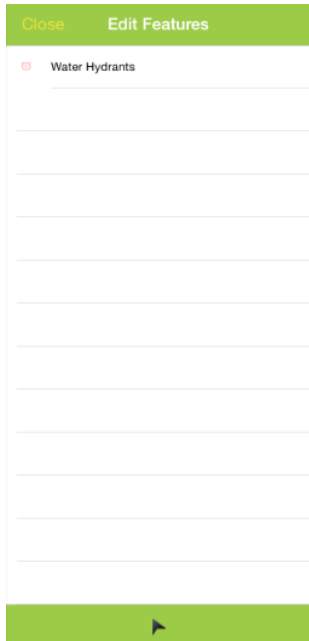
The editing process works the same for these features as the redline editing once a target layer is selected.
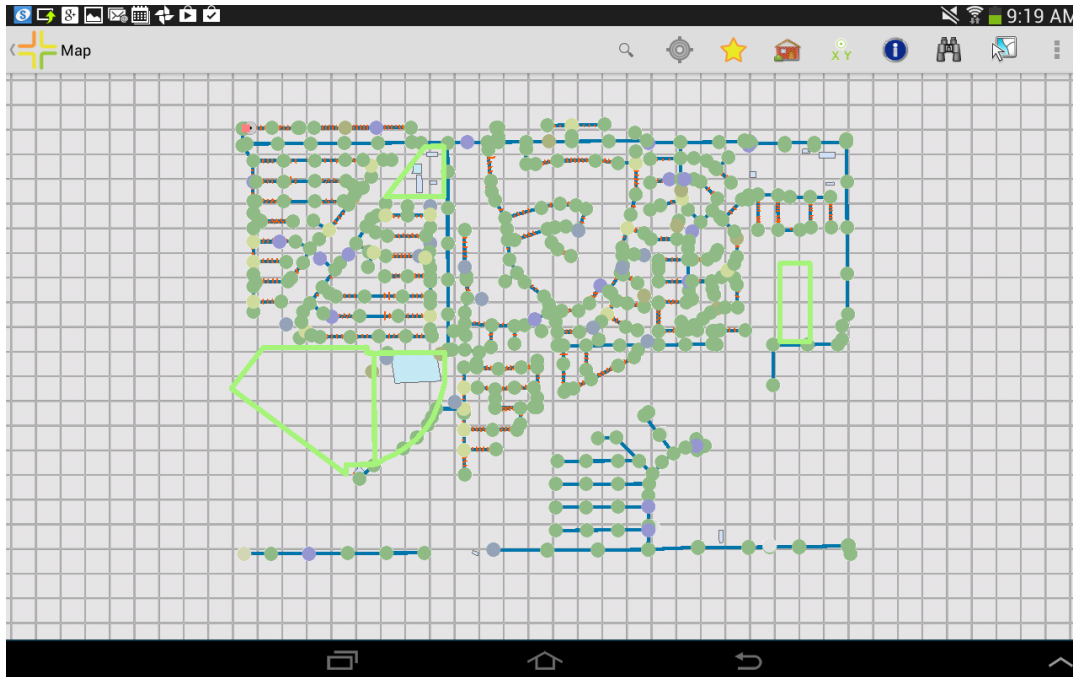
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Tablet Cradle to Mobile - GIS

Android GIS

GIS from the Dashboard

When GIS is launched from the dashboard it opens the map to the last map in the last extent.

If a map has any secured services that do not have credentials pre- configured in Lucity Admin, the user will be prompted to log in when the map is opened.


Viewing and Changing Map Information

The very first time the map is opened, it will attempt to use the map that is configured by default for the user. It is common to use an alternate map while in the field though, and this can be done by selecting the alternate map within the tablet. The tablet will remember the alternate map.

Changing maps

To change the map, select change map from the menu.
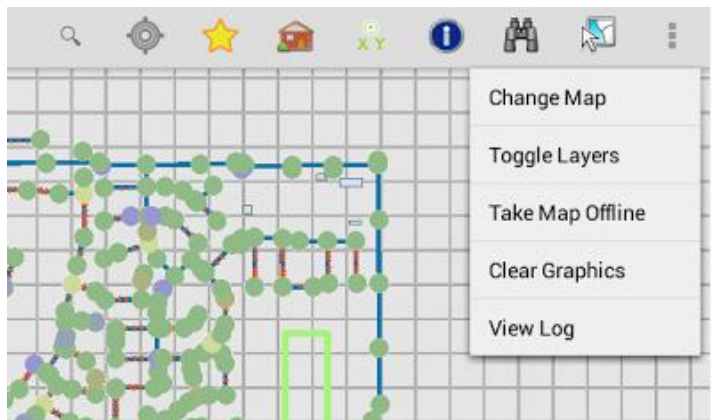
This will open a maps panel to select a new map. To close the maps panel, select Change map from the menu again. The menu option works like a toggle. All available maps will be listed. The currently loaded map is selected. To switch to a different map, select the alternate map in the list. The map will immediately redraw. The application will remember the new map selected for the next time the map is opened.
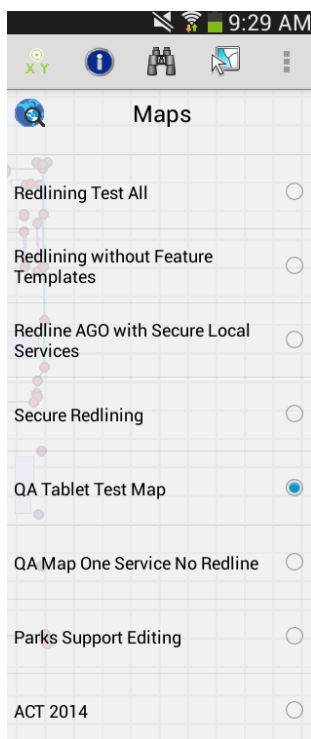
Base maps are not currently supported in the Android tablets. Take this into consideration when designing maps. If both Android and iOS applications are used at the agency, it may be a good idea to design separate maps for iOS and Android use.

Tablet Cradle to Mobile - GIS

Turning Map Services On/Off

The application does not allow turning off individual layers in a map service, but it is possible to turn off an entire map service on the layers tab. To open the layers panel, select Toggle Layers from the menu. This will open up a layers panel.
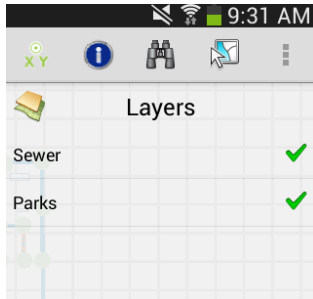

Turn off or on any layers desired and close the toggle layers panel by selecting Toggle layers from the menu again. When the map is reopened it will remember the layer visibility.

Map Navigation

Zooming and Panning

The map supports drag pan navigation and pinch zoom.   It also supports a press and hold magnifier. To activate this, tap and hold on the map until the magnifying glass shows up. The magnifier can be dragged around the screen as needed. To close the magnify window, drag it then release your finger and it will disappear.
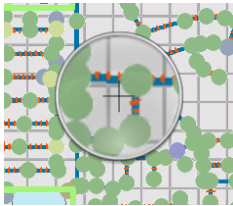

GPS Location

The map has a GPS location tool which will zoom and plot the current location. Click ⊙ to activate the GPS. The map will display a blue dot with a blue circle around it to indicate the current accuracy of the position. As you drive or move, the map display will automatically pan to keep the current location within the extent.

Click the GPS button again ⊙ to change to a heading mode which will show the location and compass bearing.

To turn off the GPS, click the GPS button ◯ again, which will change it back to grey and turn off the GPS location.
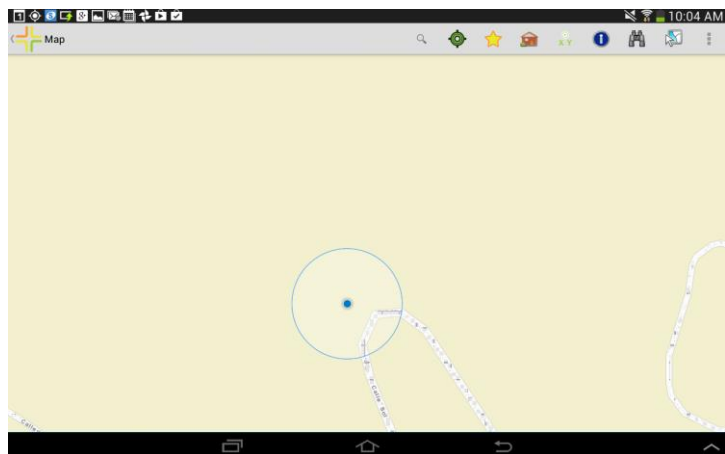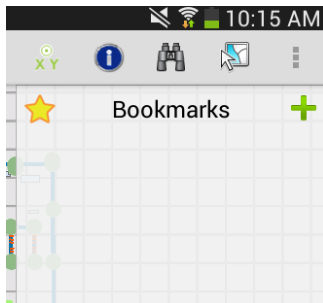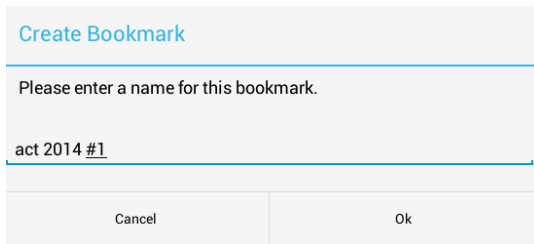
Bookmarks

Bookmarks are an easy way to save an extent of a map to get back to it easily. Bookmarks are also important for the go offline process for maps. The Bookmarks panel is accessed from the upper right toolbar
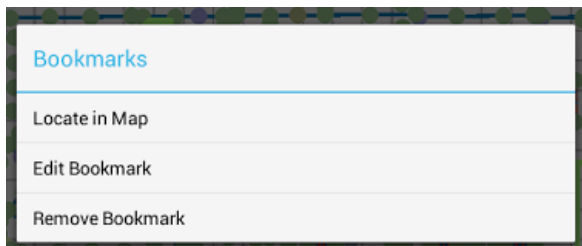

This opens a panel displaying all of the existing bookmarks.

To add a bookmark for the current extent, click the "+" and give the bookmark a name.

To zoom to a bookmark, select it from the list. To edit or remove a bookmark, press and hold on the bookmark.
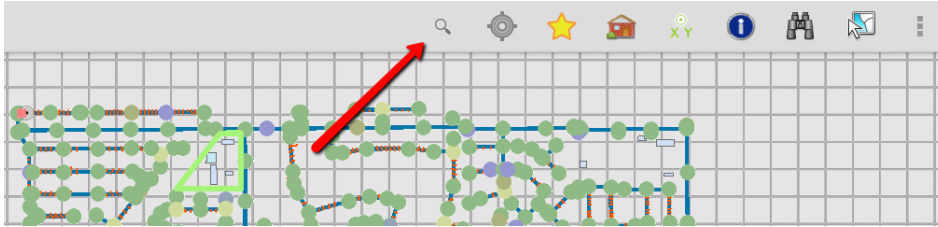

Tap the bookmark star tool to close the bookmarks pane.

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Tablet Cradle to Mobile - GIS

## Searching in the map

Searching for Addresses

To search for an address in the map, click the search button in the upper right toolbar

Tap into the search area and type the address and click the search icon on the keyboard. If the address is found, a green dot will be placed on the map at the calculated address location. Tap on the dot for more options including driving directions, creating a request for the selected address, and creating a work order for the selected address.

Address searches will use your own geocoder. If you are not on ArcGIS 10.2 or higher, we recommend using the ArcGIS Online geocoder:
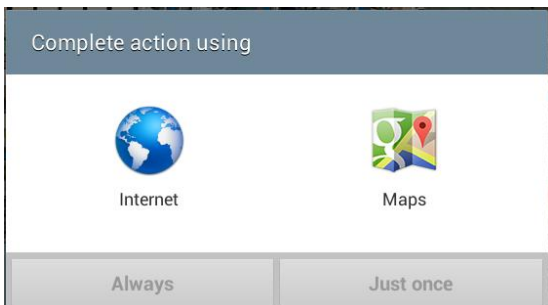http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer
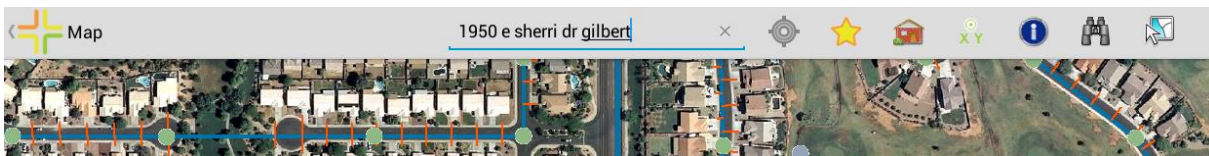
Notice in the following case it did not find an exact match.
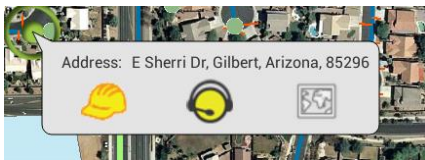
Driving directions   will open the available routing apps and show driving directions from the current location (if available) to the searched address.

Creating a Work Order will create a work order using the default tablet category and will attach the address as a location on the work order.
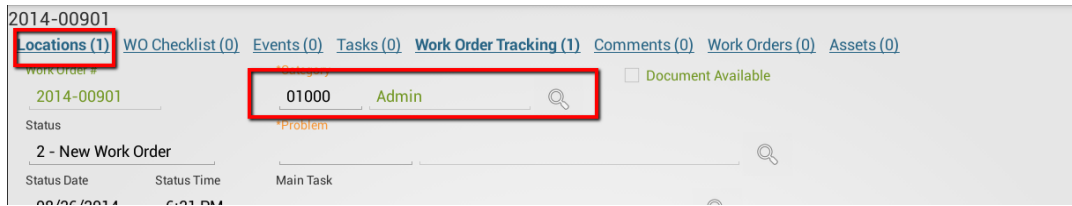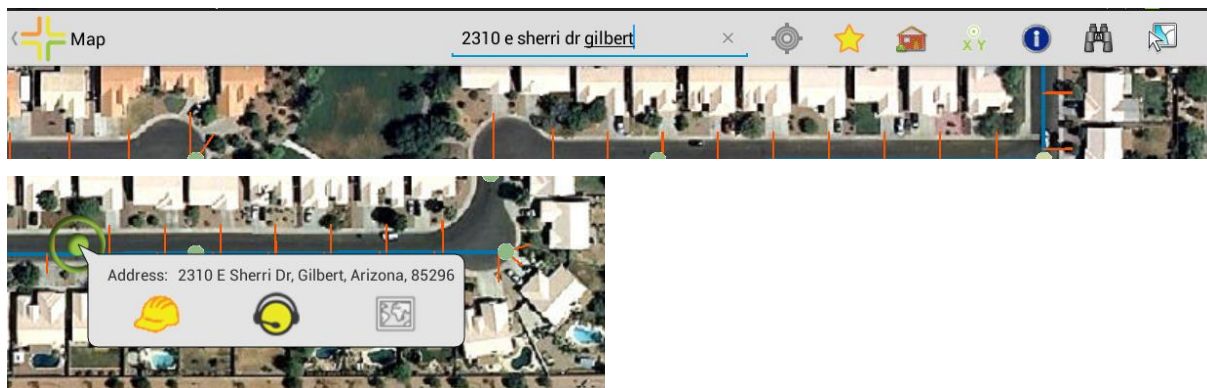

To configure the category, click the menu button on the Dashboard and select "View Settings" from the dashboard.

When the work order button is clicked, a work order is created, the address is added to the work order, and the work order is opened in a form. At this point the work order can be filled in (and category can be changed, if desired).

The address added to the work order is the located address, it is not the address searched. It is possible that the address locate may not find an exact match, but it will select the closest match. The match returned on the geolocate is what is placed in the work order location field.

The work order is saved to the server before a form is displayed. Navigating away from the work order at this point will not cause the work order to be discarded.

This address does find an exact match.

Creating a request from an address search will create the request, default the category, and assign the location address of the request to the address from the search results. The form is opened so that any further edits can be made.
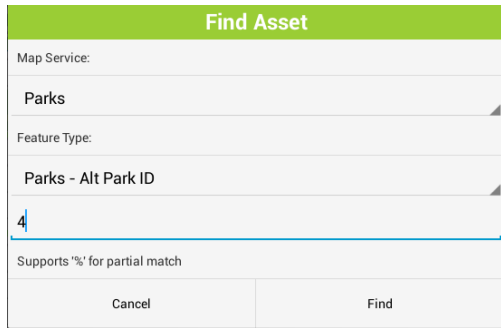
Searching for Assets

The Lucity Android map application also allows searching for an asset based on full or partial common Id of the asset. To search for an asset, click the Find button.
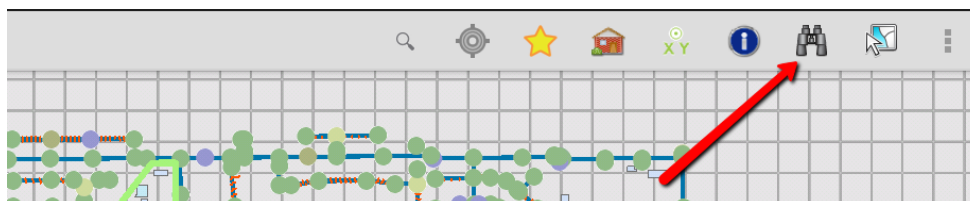
If there is more than one operational map service in the map, the dialog will allow you to select which map service the information is in and the type of feature to find. The Feature type picklist shows both the common name of the asset type as well as the name of the field in that layer that will be searched.

Enter the text to search for. Include a % to search for any character. For example to search for everything with the name South anywhere in the common id, enter %South%.

Click Find.

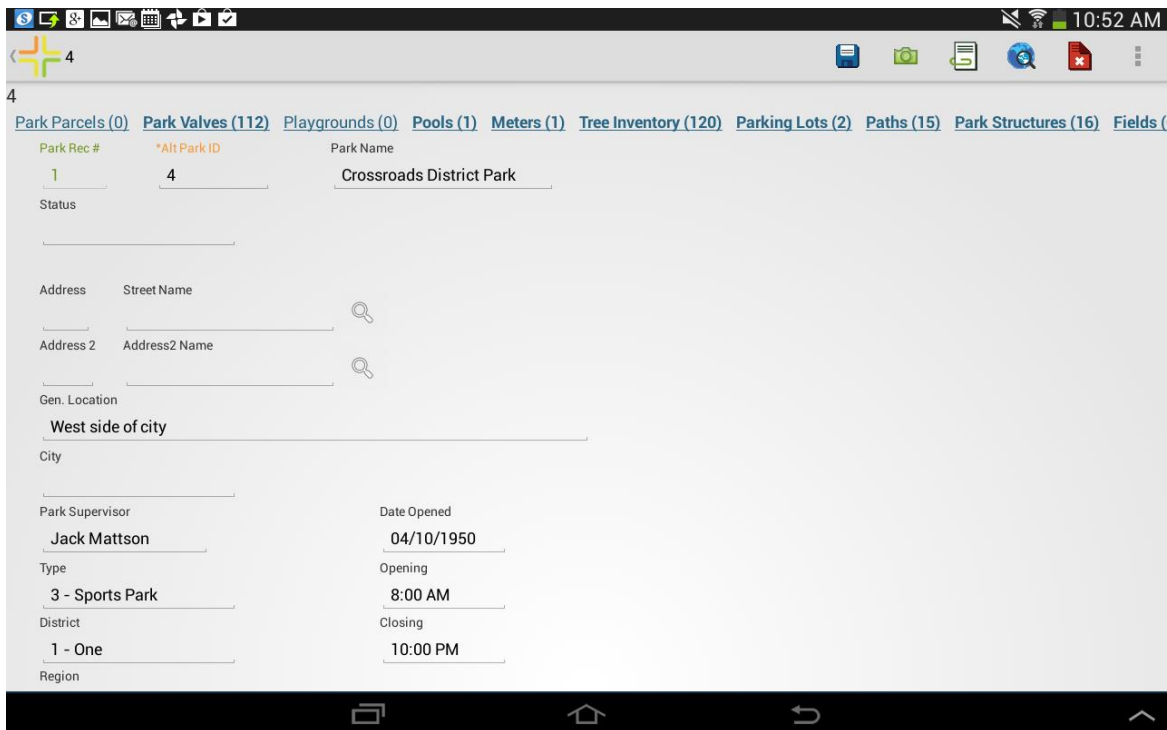If features are found they will be selected in the map.
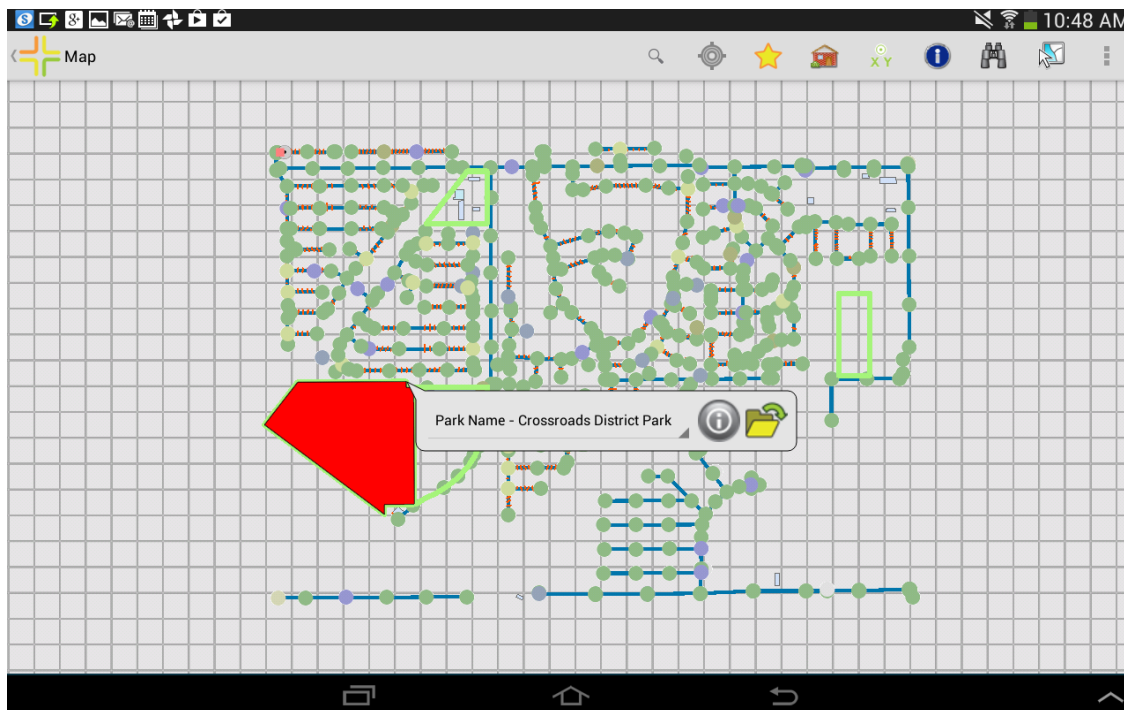
Tapping on the item will show more features that were found from the search. In the above example, only one feature was found.

Tapping the will open a popup and show the details about the item that was found.

Parks Details	
GlobalID	{1716A099-0F49-4907-B6EA-80E5607EB993}
Last Modified By	: Lucity
Owner Code	: 1
Alt Park ID	: 4
Last Synchronized Date	: 12/06/2011 8:00:00 AM
Last Modified date	: 12/07/2011 12:44:30 AM
SHAPE.STLength()	: 5982.228671649304
Area	: 1985277.0
SHAPE.STArea()	: 2060148.0505981445
In Lucity Database?	: 1
Park No.	: 1
Park Name	: Crossroads District Park
OBJECTID	: 1

Close

Tap the back button to close the popup.

Tapping the will open the Lucity form for the current feature.

Hit back to return to the map.

Tablet Cradle to Mobile - GIS

Selections or graphics can be easily cleared using the Clear Graphics option in the menu

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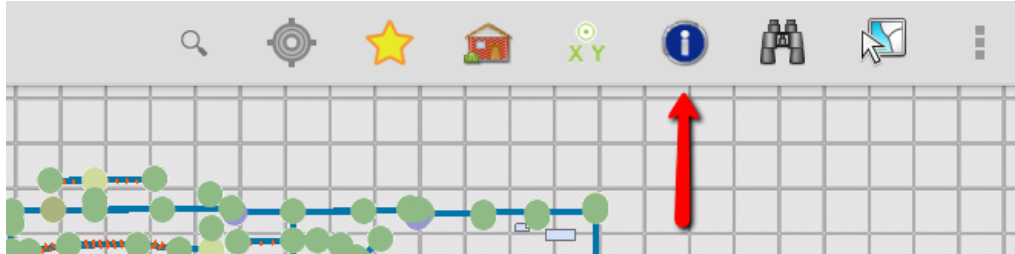
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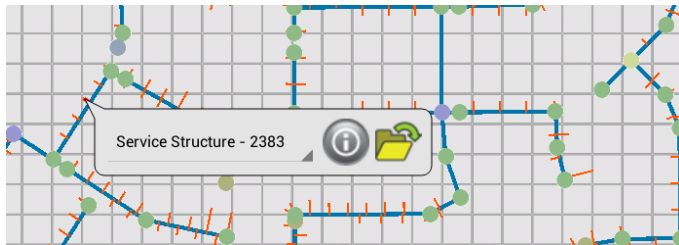
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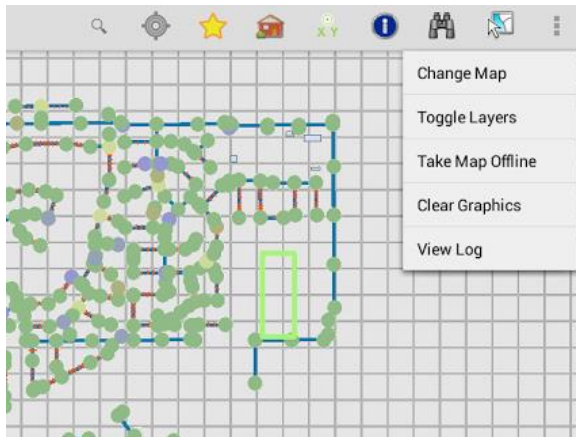
Tablet Cradle to Mobile - GIS

Inspecting and Selecting

Identify

To inspect or identify a feature in the map, use the identify tool.

Tap the feature you want details on. This will pull up a popup with the name of the display field as well as value of the display field for the feature.

There may be more than one feature at that location. To view other features at that tap point, click the green arrow to pull up a list of all features found. The popup is a scrollable list. Find the item you are interested in and select it from the popup list.
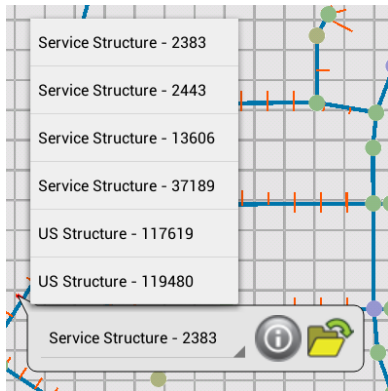
The details popup provides a scrollable list with access to all of the attributes deployed for that feature in the map service and provides the ability to create a work order, a request, or an inspection on a feature, as well as view the Lucity feature relationships.

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To create a work order for the current feature, click the Work Order button. This will create a new work order and attach the asset to the work order, and open the work order for further edits. The category for the work order is assigned based on the default category defined in Lucity for the selected feature.   If there is no default category defined, the system finds the first available category in the category list with the correct asset type.

Click Back to go back to the map

Creating a request works the same way as a work order from the identify dialog. Click the Create Request button and it will create the request for the asset, place the asset on the request and assign a category to the request based on the selected asset. The request form is then opened for any further edits.

Creating an inspection from the identify dialog will create an inspection for the current feature for the current date and time. If there is more than one possible inspection type, the user is prompted for which type of inspection to create:

The created inspection is opened for further editing in a form.

Tablet Cradle to Mobile - GIS

Clicking the relationships button opens a panel showing all relationships to the current feature (where there are records). Clicking on one of the relationships in the list will open a view which contains all of the items for the selected relationship.
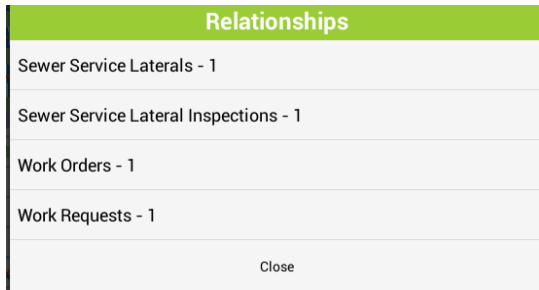

To turn off the identify tool and remove the graphics from the map, click the identify button again on the toolbar or select a different tool.

Point to address

One of the other tools provided in the tablet map is the ability to tap a point on the map and have the map attempt to calculate what the address is for that location.
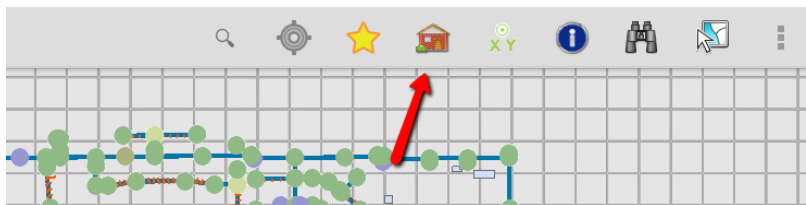
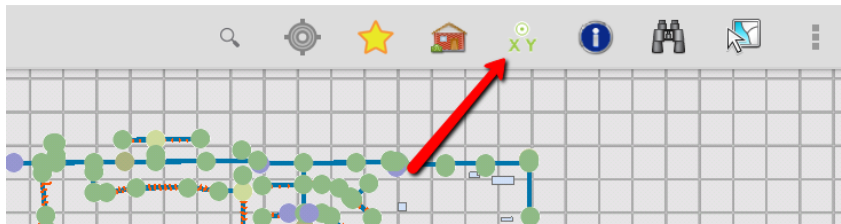Tap a location on the map to open a prompt showing the approximated address:
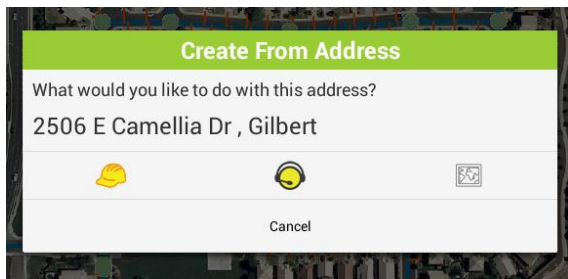
This reverse geocode uses the Esri world geocoding service. It does not use your own geocoding service for the search operation.

The work order, request, and driving directions tools on this dialog work the same as the address search dialog discussed earlier in the session.
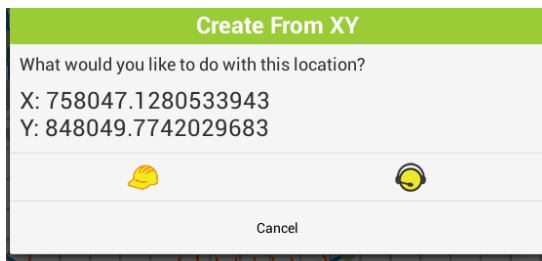
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Creating Requests or Work Orders at a Specified Point

If a work order or request is not being performed at a specific address or on a specific asset, using the XY tool is a good way to identify the location of the work being done.

Tap the location on the map where the work is. This will prompt for what to do with the specified point.


Creating a work order will create a new work order using the defined default category and add a location record with the specified XY. Creating a request will create a new request using the default category for the user/tablet and will put the XY on the request as the request location.

The coordinates displayed in the prompt are in the local defined coordinate system. This may vary from the map coordinate system. The Lucity mobile application automatically projects these coordinates into the operational coordinate system defined in the system settings.
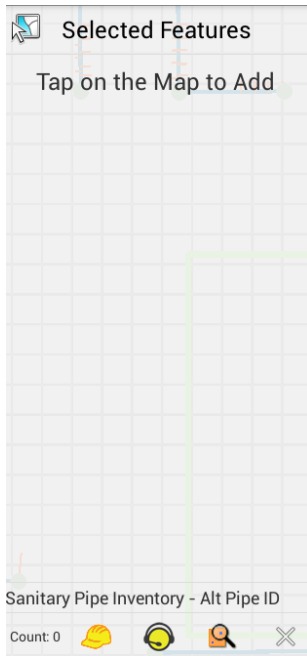

Multiple select

It is possible to select and work with multiple assets at a time using the multi-select tool:
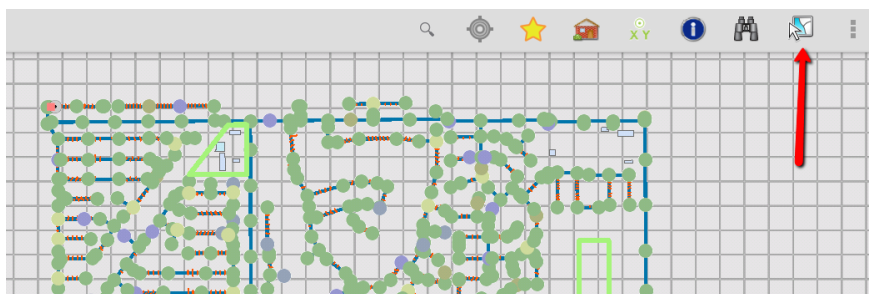

The tool prompts for which map service and layer you want to select features from:

Tablet Cradle to Mobile - GIS
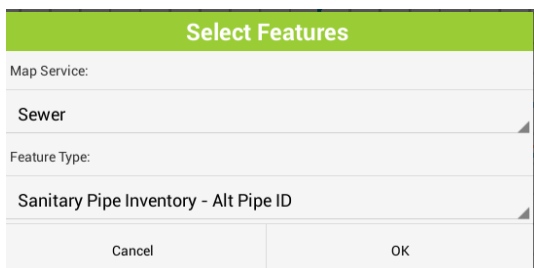
The tool then expands in preparation to display the list of features you select.

Clicking Select returns you to the map to start tapping the desired features to be added to the multi-select. Each feature in the selected layer that is tapped will be highlighted and the identifier will be added to the list of features in the Select Features pane.
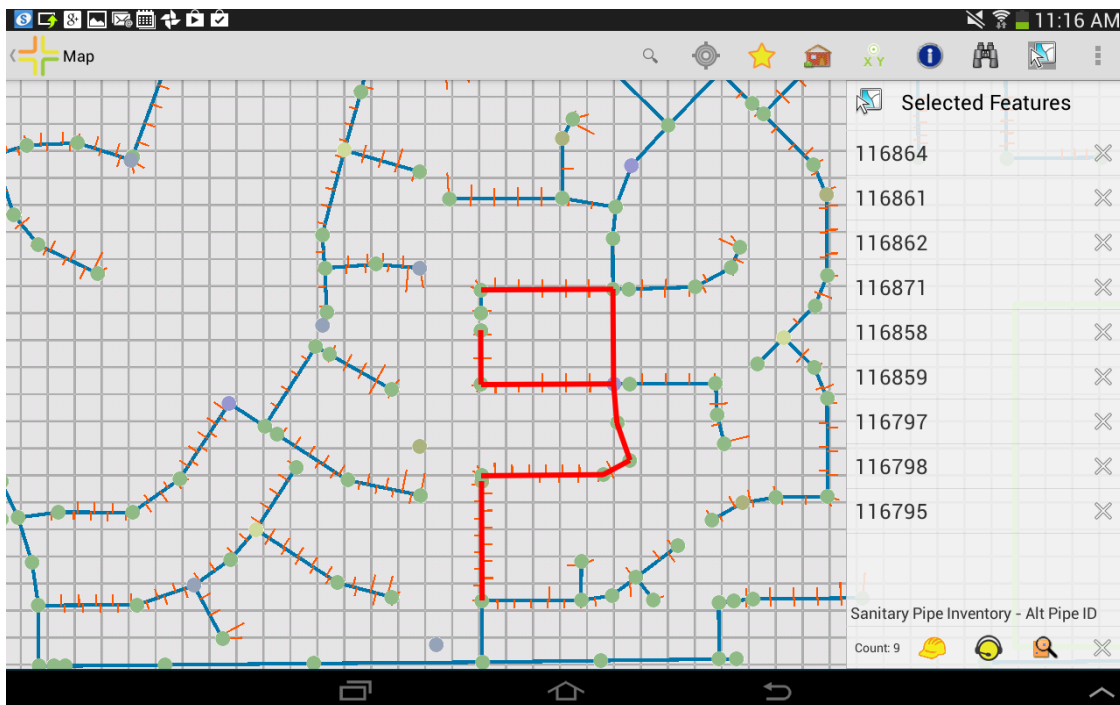
To unselect a feature, click the "X" next to the feature in the list. Tapping a feature in the pane will flash the feature in the map.

 A running count of features is show at the bottom along with tools to create work orders, requests, and inspections on the selected features.

Tablet Cradle to Mobile - GIS

Creating a work order creates one work order and attaches all assets to the work order. The work order form is opened for further editing.

The Create Request function creates one request for each item. The system will display a toast message to indicate that the creation was successful.
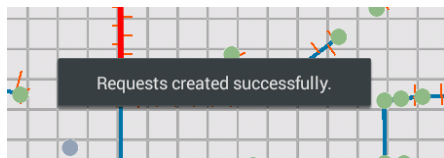
Create inspections will create an inspection for each feature on the list for the current date and time. Some features support multiple types of inspections. These features will have an additional prompt for which type of inspection to create.

Inspection Type
Sewer TV Inspections
Sewer Line Lampings
Sewer Smoke Tests
Sewer Building Inspections
Sewer PACP Inspections
Sewer Pipe Air Tests
Sewer Pipe Mandrel Tests
Cancel

The inspections are created and a toast is displayed.

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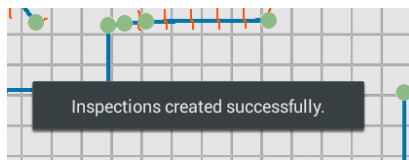
Tablet Cradle to Mobile - GIS
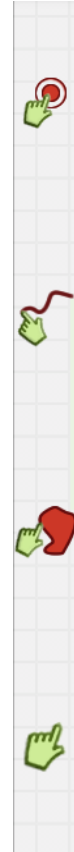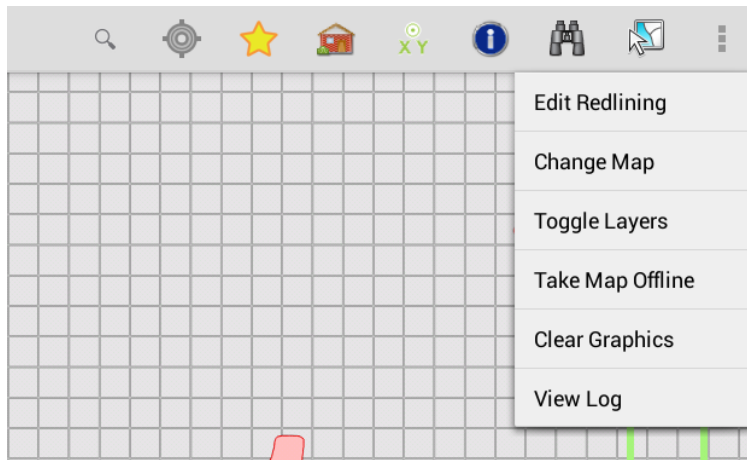
Redlining in the map

Maps can be configured to allow users to redline graphics and make notes directly in the map. Redlining is different than editing because it is not designed to work with Lucity features. It is designed to provide a way to communicate with back end GIS staff or other agency staff about something in the map. Redlining uses feature services with ArcGIS Server or on ArcGIS Online.

Maps which have a layer which is compatible with redlining will have a menu option for Edit Redlining.

Tapping this tool will open a redline objects panel with tools for adding lines, points, polygons, and for selecting existing redlining features. Use these tools to draw on the map. After the feature is drawn, a prompt will be displayed to enter attributes:

This prompt does not provide a picklist for fields with GIS domains.

To edit the attributes or shape of an existing feature, use the select button and tap on the feature. This will select the feature. Tap the "i" to edit the attributes.

To leave redlining mode, select Edit Redlining from the menu to close the panel.

Editing

In addition to redlining, we also support a Feature Editing function which provides a more flexibility. It can be used, for example, to edit features integrated with Lucity. Before setting users up to do this, make sure you are not using the Lucity SOE GIS edit method any longer. You need to be using the Lucity feature services method for your edit maintenance.

If a Map Service has a corresponding feature service, you can check the Has Feature Service checkbox in Map Services to enable feature editing.

(If you want to disable editing for certain maps, this can be done in the Map Setup form).

If at least one layer supports editing, an additional menu option will be available from the overflow menu "Feature Editing".
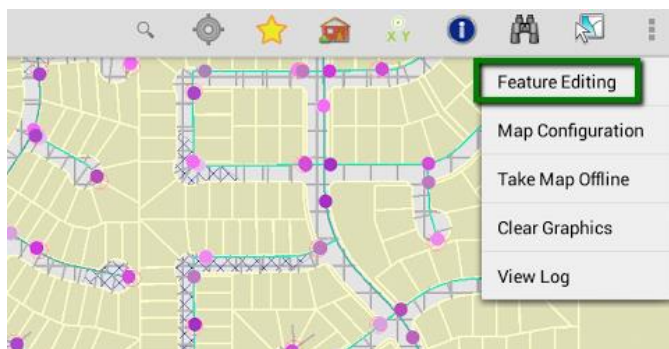
If there are multiple map services which support editing, you will be prompted for the map service you want to edit. If you only have one editable map service, this step is skipped.

Next you are prompted for what layer to edit:

Tablet Cradle to Mobile - GIS

This opens the feature editing pane.

From this point on, the workflow is the same as redlining.

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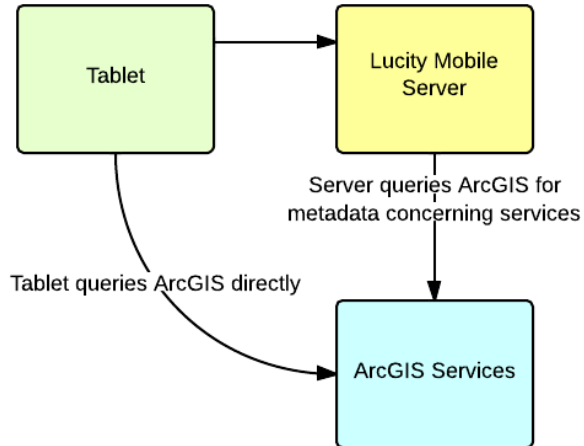
Tablet Cradle to Mobile - GIS

Configuring GIS for mobile

If maps are already configured for Lucity Web, it may not be necessary to make many, if any, adjustments for mobile except to ensure that the tablet can access the GIS resources. The following lines of communication are required for Lucity Mobile to work properly:

If necessary, alternate Urls can be configured for internal versus external connections. These urls should point to the same source map service, however! This is only used to allow for differences in routable addresses between internal and external clients.

If you use the same url internally and externally, don't populate the Mobile Url field.

Additional considerations are relevant for offline GIS. These are discussed later in the session.

Using Feature Services and ArcGIS Online instead of Map Services and ArcGIS Server

This documentation covers using Map Services with the Lucity Mobile iOS Map. It is also possible to use feature services in lieu of map services. This would be the suggested method if you were hosting all of your GIS data on ArcGIS Online for your mobile users.

If you have a choice, we currently recommend using the ArcGIS Server and Map Service model because it provides a little more flexibility and functionality with our current offerings. This is what was presented in today's session.