lucity™
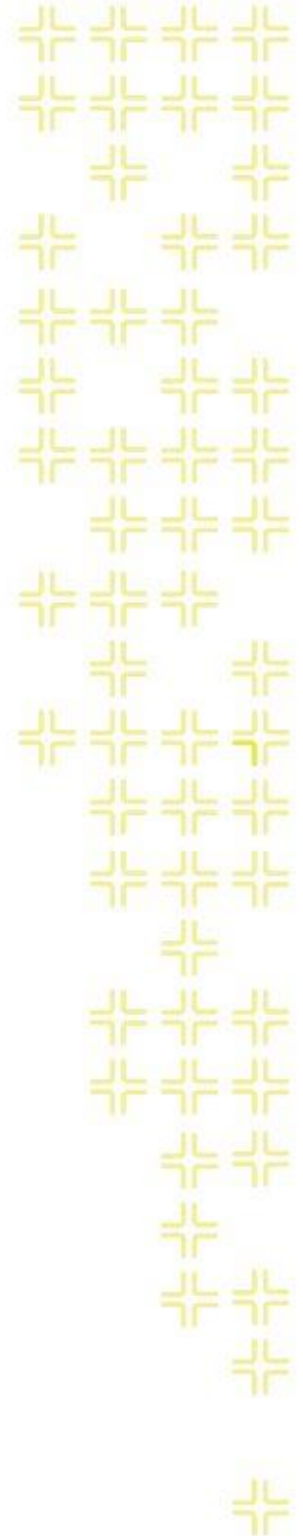
What's New in Lucity GIS for 2015 and 2015r2

What's New in Lucity GIS for 2015 and 2015r2

In this session, we'll introduce you to new Lucity GIS tools available since ACT 2014.

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Overall Changes in Lucity GIS

Highlights for version 2015

- GIS Scheduled Tasks
    - Now supports the use of number generators for GIS to Lucity imports
- Improved method for processing geocoding requests.
    - Only available for geocoding services at version 10.2+. There is a new system setting to indicate if geocoding services are 10.2+.
- Maintenance & Alternate Work Zones
    - There are new system settings for specifying the service information (map service, layer index, zone field) for the maintenance and alternate work zones.
- Support for ArcGIS Online hosted data sources
    - In GIS Connection Strings there is a new database type: ArcGISOnline.
    - In UI Admin there is a new tool, GIS Config, which is used to configure ArcGIS Online hosted services with Lucity. This should only be used to configure off-premise data.
- New System Default Extent
    - This is used with the new geocoding method to help limit results
    - Also used in determining the default extent of web and mobile maps
- New property when defining maps to indicate if the map can be used with Lucity Web, Lucity Mobile, or both.
- Disable Visibility option
    - New web map service option that allows the user to disable the visibility of a service by default
- Default Extent option
    - New web map service option that allows the user to use the extent of the service as the initial extent of the web map.

Highlights for version 2015r2

- New GIS enabled modules:
    - Street: ITS Anti-Icing Pump House, ITS Anti-Icing Equipment, ITS Automated Gates, ITS Camera Locations, ITS Dynamic Message Sign, ITS Portable Dynamic Message Sign, ITS Weather Station, ITS Sensor, ITS Kiosk
    - Storm: Water Quality Management Plan, Water Quality Construction Site, Water Quality Commercial Inventory, Water Quality Industrial Inventory, Water Quality Municipal Inventory
- Support for Esri's Local Government Information Model July 2015 release
- Adds support for number generators and spatial relationships that contain layers in different services
- Adds support for many-to-many relationships between user groups and web maps

- Now the mobile and web maps will only allow users access to maps that have been assigned to groups the user is associated with
- GIS Scheduled Tasks
  - Adds support for number generators that have a prefix polygon layer in different service than the asset layer.
  - Modifies the import process so that asset coordinates are calculated and populated in Lucity similar as the ArcMap sync process.
  - Adds enhancement so the import process will now perform spatial relationships

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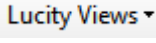
ArcMap Changes
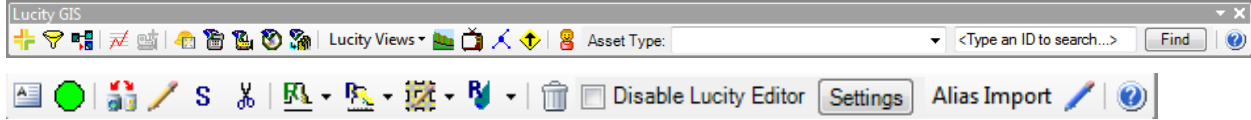

Tools added or modified for 2015r2 (no changes in 2015)

Button	Name	Description
	Update Spatial Relationships	• New hardcoded spatial relationship for maintaining room and building associations. • Supports a new reverse geocode spatial relationship option
Lucity Views ▾	Lucity Views	• Adds two new street views for Street Pavement Maintenance and Road Pavement Maintenance. • Removes the Live Work Order and Request tools (these have been replaced by the new Lucity Work Spatial tools)
S	Lucity Editor Extension	The logic used in determining the coordinates for an asset have changed
	Storm Renumber	Now supports renumbering Storm BMP Asset, BMP Asset Items, and BMP Sites.
	Create Work Order	A new option has been added to the create work order process to allow users to create a work order from a template.

• When room features are synced in an ArcMap edit session, the Lucity editor extension will automatically calculate the building association based upon the related floor.

• When features are synced in an ArcMap edit session, the Lucity editor extension will now calculate the coordinates for an asset using:

   o Point features: the coordinate of the point (this logic remains the same)

   o Linear features: midpoint of the line (previously it was the from point)

   o Polygon features: the centroid of the polygon UNLESS the centroid doesn't intersect the polygon then it uses the label coordinate (previously it was using the from point)

Create Work Order from Template

The create work order process in ArcMap now has an option to use a PM/Work template when creating the work order. This option is only available when creating work order against valid asset types.

1. Select the Lucity Module tool ⊹ from the Lucity toolbar.

2. In the map, right click on the feature with which you would like to work with.

   Note: If you wish to work with multiple features, select the features in the map with the ESRI selection tool or the Lucity Module tool then using the Lucity Module tool right-click anywhere in the map.

3. A dialog box will appear.
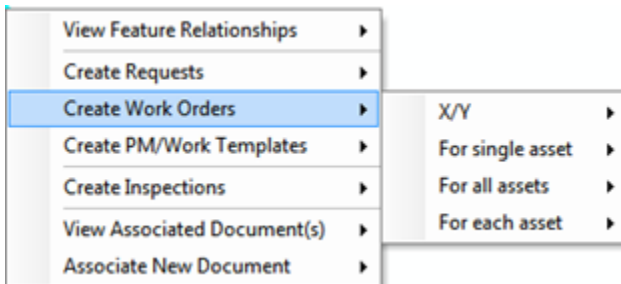
4. Select the desired work option. The template option is not available if creating work order using x/y or if choosing an option that has more than one asset type.

5. If there is at least one PM/Work Template record of the same asset type that you selected then the following prompt will appear:
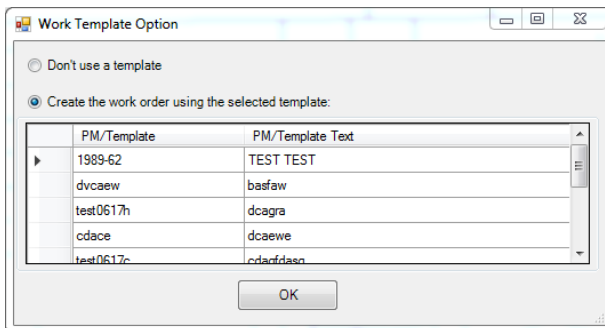

6. *Don't use a template* is the default option on this form. If you wish to create a work order using one of the templates, select the second option, select a template from the list, and click OK.

7. The required fields for work order form will appear. Fill out the applicable information and select an option to complete the process.
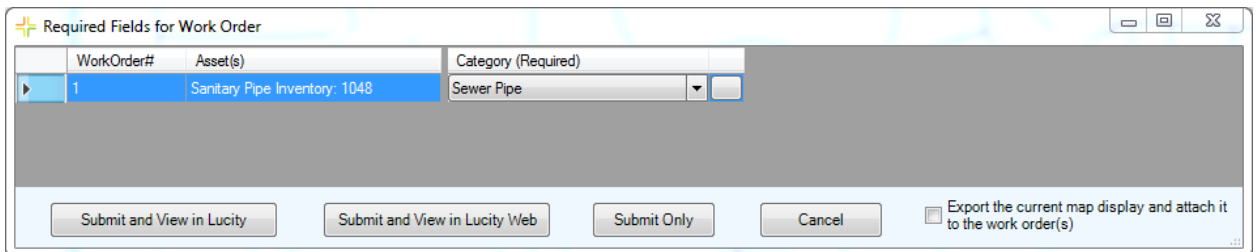
Pavement Maintenance Views

There are two new views that will graphically show the latest inspection results for each subsegment and/or road segment. By default this tool will symbolize the results based on the inspection's override PCI value (RB_OPCI). As with any of the Lucity view tools, the user can customize the results including which field to use for symbology.

1. Select either the View Street or Road Pavement Maintenance option from the Lucity Views menu.
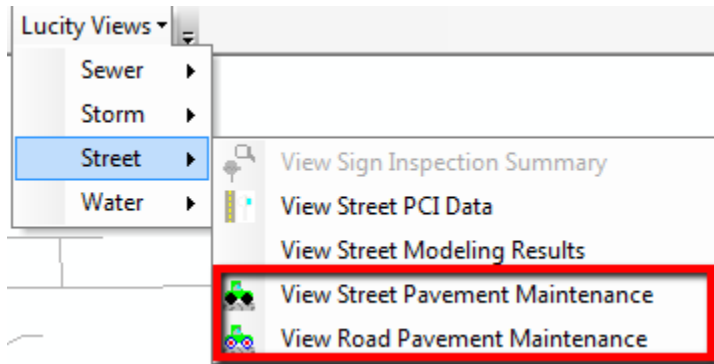
2. The length of time each tool takes to run depends on the number of records you have in the Lucity database. A progress bar located in the bottom left-hand corner of the ArcMap window will show the status of the tool.

3. When completed, an additional instance of the feature layer will be added to the map. The instance will have an alias name identifying the tool that you used.
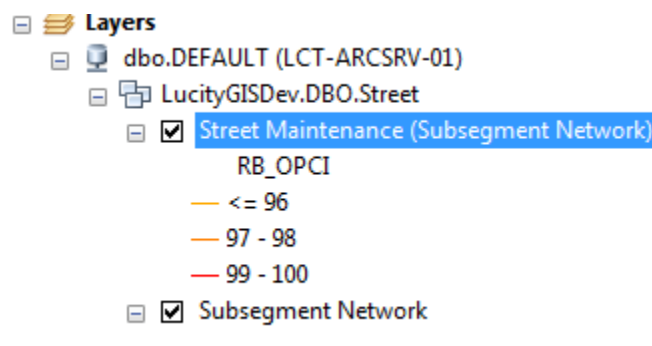
Note: As with any of the other views, you can customize the filter used when initially creating the view. To do this, simply hold the SHIFT key while you click the view from the Lucity view menu.

ArcCatalog Changes

Tools added or modified for 2015

Name	Description
Scheduled Tasks	New option to enable number generator for imports

Tools added or modified for 2015r2

Name	Description
Add Feature Class	Ability to map to new asset inventory modules: • Street: ITS Anti-Icing Pump House, ITS Anti-Icing Equipment, ITS Automated Gates, ITS Camera Locations, ITS Dynamic Message Sign, ITS Portable Dynamic Message Sign, ITS Weather Station, ITS Sensor, ITS Kiosk • Storm: Water Quality Management Plan, Water Quality Construction Site, Water Quality Commercial Inventory, Water Quality Industrial Inventory, Water Quality Municipal Inventory
Scheduled Tasks	New option to enable spatial relates for imports
Number Generators	Ability to specify the service that contains the polygon feature class used to determine the prefix.
Spatial Relationships	• Ability to specify the service that contains the related feature class. • A new spatial relationship type has been added: Reverse Geocode.
Import Feature Classes from Schema	Includes support for the July 2015 Esri's Local Government Information Model

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GIS Scheduled Tasks- Configuring Number Generators and Spatial Relationships

GIS Scheduled Tasks created for importing data from GIS to Lucity can now be configured to utilize the number generators and/or spatial relationships defined for the feature class. This further streamlines the synchronization process between GIS and Lucity and makes the Scheduled Task behave similar to the ArcMap to Lucity synchronization process.

There is a new option with the Number Generators and Spatial Relationships to specify a web service that contains the related feature class. This is only needed if the related feature class isn't in the same service as the Lucity linked feature class.

For example, say you have a spatial relationship setup for your water service feature class. The relationship is designed to update a water service field with the parcel ID of the parcel feature it intersects. Where this becomes an issue is when the parcel feature class isn't in the same service as your water service feature class. In situations like this, you would want to specify the service that contains the parcel feature class.

Note: You must first setup the service in Map Services in UI Administration.

To start utilizing Number Generators and Spatial Relationships with your existing GIS Scheduled Tasks, you will need to turn on these capabilities within the GIS Scheduled Tasks. By default, when you upgrade to the latest Lucity version these two options are not enabled.

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Spatial Relationships- Reverse Geocode

With v2015r2, a new *Reverse Geocode* spatial relationship type has been added. Unlike other spatial relationship types, this one does not use a related feature class; instead, it will use the default locator. In the case of an ArcMap edit session the default locator is the same as the active locator in the .mxd.

Note: Reverse Geocode spatial relates are only functional with the ArcMap edit session. We plan to support this type of relationship with GIS Scheduled Tasks at version 2016.

What it does

The reverse geocode spatial relate will calculate the x/y coordinates of the feature and use that to determine the address associated at that location. It then checks if the feature class has address fields linked to Lucity, if so, it will update these GIS fields with the address information. If not, it will bypass the GIS and make updates directly to the address fields in Lucity. This means that unlike other spatial relationships you don't have to have these address fields in your feature class, if they don't exist then the Lucity editor extension will update the address fields in Lucity directly.

Process

1. Verifies that there is a default locator in the map. If not, the process is terminated.

2. Determine what the Lucity address fields are for the specific asset inventory module. If the asset inventory module doesn't contain address information then the process is terminated.

3. Determine if the feature class has fields mapped to the Lucity address fields found in previous step.

4. If address fields are not in the GIS and the feature doesn't have a Common ID specified, the process will terminate (since it won't be able to determine the corresponding record in Lucity)

5. If the Never Overwrite setting is TRUE and address fields are already populated, the process will terminate

6. Calculates X/Y for feature.

    a. For point geometries, it will simply use the point x/y value

    b. For line geometries, it will use the midpoint of the line

    c. For polygon geometries, it will calculate the centroid. It then checks if the centroid intersects the polygon.

        i. If so, it uses the x/y of the centroid.

        ii. If not (situations like where a polygon is shaped like the letter U), then it uses the x/y of the label point. The label point is an Esri calculated point that is guaranteed to intersect the polygon feature.

7. Passes the X/Y calculated value and the spatial relationship distance value (think of this as a buffer) to the locator and gets results.

8. If the locator didn't return an address and the Update Value To Null setting is set to FALSE then the process will terminate

9. Updates the address fields. If the feature class was found to have the address fields (step 3) then these address fields are updated for the feature in the GIS; otherwise, the address fields in the Lucity asset inventory module are directly updated.

Setting up a Reverse Geocode Spatial Relate

1. In the Geodatabase Configuration tool in ArcCatalog, select the desired feature class node. Right-click and select Add>>Spatial Relationship
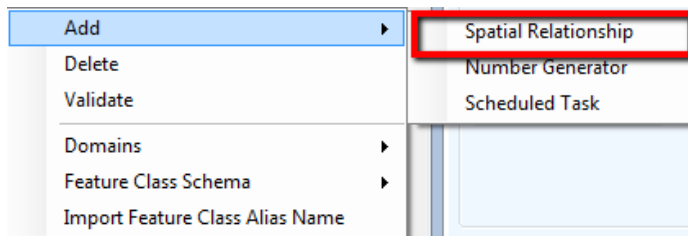
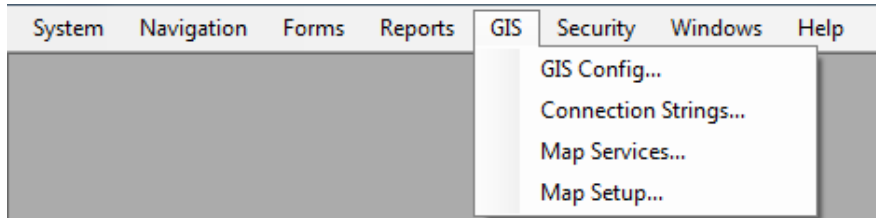

2. For Reverse Geocode spatial relates all you should need to specify is the Type, Distance, and the two options.

   a. The distance value is used as a buffer with the asset x/y in determining the address. You may need to experiment with this value based upon how your address locator was created. For example, a locator created using a polygon parcel feature class vs. a point address feature class will have different results given the buffer. It is advised to use a larger distance value, as the locator will typically return the closest address if more than one exist within the buffered area.
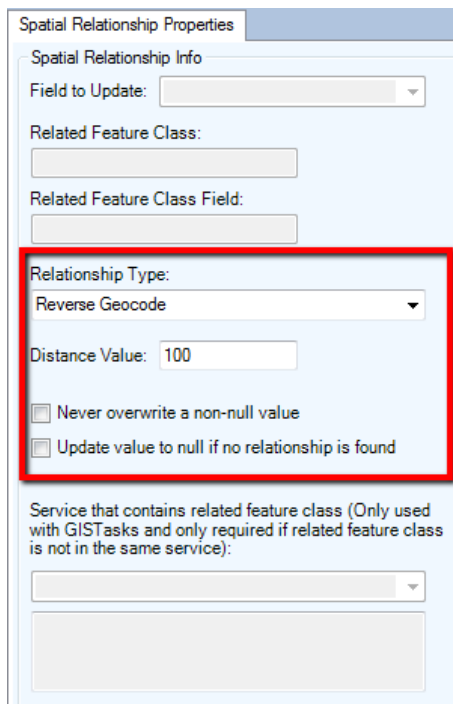
3. Once created the Reverse Geocode will be triggered during the following three situations:

   a. Within an ArcMap edit session, when a feature is created or when an existing feature's shape is changed.

   b. Within an ArcMap edit session when using the "Update Spatial Relationships" tool on the Lucity GIS Edit toolbar. This tool is typically used if the data was imported using a non-Lucity import tool or was added during a non-Lucity edit session.

   c. When the Lucity Data Loader is used.

Lucity Administration Tool Changes

Tools added or modified for 2015

Name	Description
System Settings	• New setting to indicate if geocoding service is on version 10.2+ • There are new system settings for specifying the service information (map service, layer index, zone field) for maintenance and alternate work zones
GIS Config	A new tool used to configure ArcGIS Online hosted services with Lucity. This should only be used to configure off-premise data.
Connection Strings	New database type: ArcGISOnline. This is used for AGOL hosted data sources.
Map Setup	• New System Default Extent. This is used with the new geocoding method to help limit results and also used in determining the default extent of web and mobile maps • New property when defining maps to indicate if the map can be used with Lucity Web, Lucity Mobile, or both. • Disable Visibility option. New web map service option that allows the user to disable the visibility of a service by default • Default Extent option. New web map service option that allows the user to use the extent of the service as the initial extent of the web map.

Tools added or modified for 2015r2

| Name	Description
Map Setup	Adds support for many-to-many relationships between user groups and web maps. Now the mobile and web maps will only allow users access to maps that have been assigned to groups the user is associated with.

System Settings

GIS Web tab

There is a new setting: *Flag indicating that geocoding services are still ArcGIS 10.1.* This setting is used with the Lucity web and mobile maps.

In v2015, we implemented a new method of processing geocoding requests. This new method utilizes single line address locator functionality along with providing a search extent to help improve performance. These capabilities are only available for locators created on version 10.2+.

Note: When upgrading to v2015+ this setting is default to FALSE. Therefore, if your locator is on version 10.1 or earlier you will need to change this setting to TRUE. You may experience issues with locating addresses if this setting is not updated.
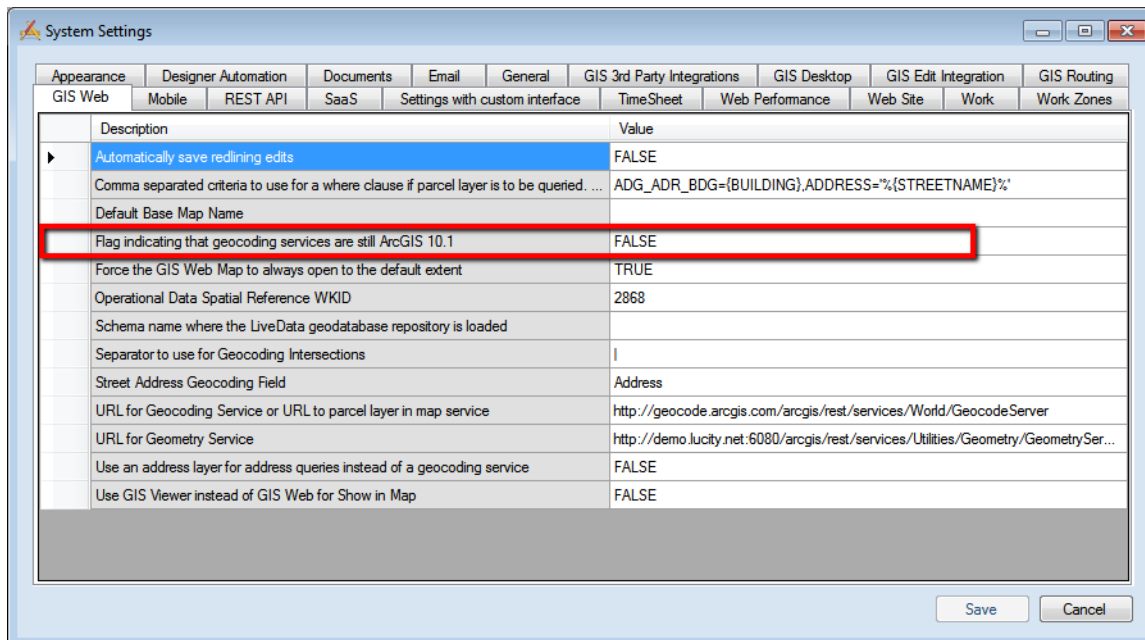
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Work Zones tab

With version 2015 new functionality was offered to assign maintenance and alternate zones to requests and work orders. The work zone tab contains settings that control how the Lucity Work program functions when assigning zones to requests and work orders.

GIS Web	Mobile	REST API	SaaS	Settings with custom interface	TimeSheet	Web Performance	Web Site	Work	Work Zones

Description	Value	Service Lookup
Alternate Zone- Field Name	GSLU_CODE	
Alternate Zone- Layer Index or Alias Name	General Plan	
Alternate Zone- Service Name	Zones	
Maintenance Zone- Field Name	ZCODE	
Maintenance Zone- Layer Index or Alias Name	Zoning Polygon	
Maintenance Zone- Service Name	Zones	
Never overwrite maintenance or alternate zone	TRUE	

- Alternate Zone- Field Name
    - The name of the field that contains the alternate zone ID in the alternate zone layer
- Alternate Zone- Layer Index or Alias Name
    - The name used for the alternate zone in the map service
- Alternate Zone- Service Name
    - The name of the map service that contains the alternate zone layer. Found in the Admin tool, under GIS>>GIS Map Services
- Maintenance Zone- Field Name
    - The name of the field that contains the maintenance zone id in the maintenance zone layer
- Maintenance Zone- Layer Index or Alias Name
    - The name of the maintenance zone layer in the map service
- Maintenance Zone- Service Name
    - The name of the map service that contains the maintenance zone layer. Found in the Admin tool, under GIS>>GIS Map Services
- Never overwrite maintenance or alternate zone
    - When enabled, prevents the system from overwriting the existing Maintenance Zone or Alternate Zone values when these fields are entered on a request or work order

Map Setup

Significant changes were made to the Map Setup dialog for version 2015 and 2015r2.
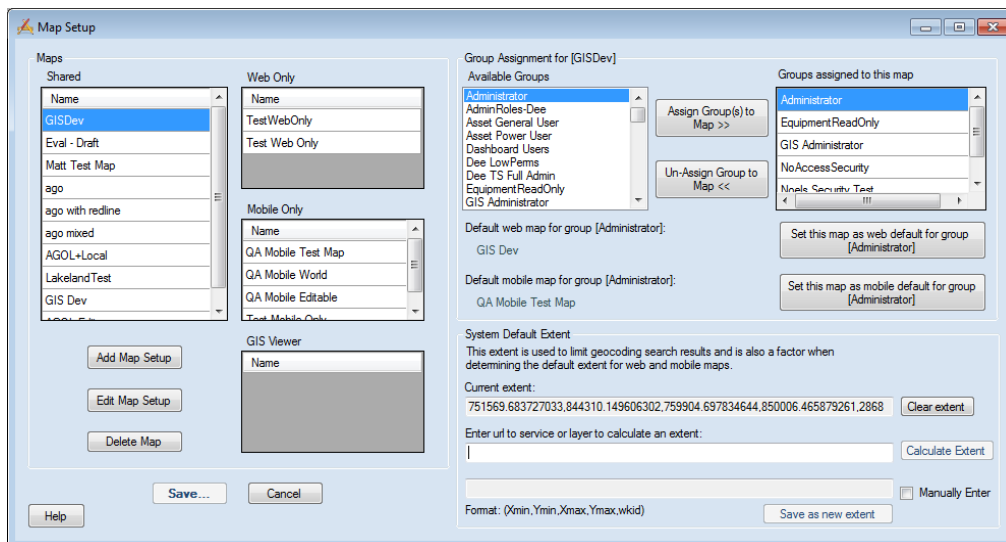
The main changes for v2015, are that the maps are grouped by map type and there is a new System Default Extent setting. The ability to indicate if the map can be used with Lucity Web, Lucity Mobile, or both is set within the GIS Map Edit form and will be discussed in that section.

System Default Extent

- Added in version 2015

- This is used with the new geocoding method to help limit the results especially if using a broad locator service such as Esri's World Geocoding Service.

- This setting is also used in the logic to determine the default extent of web and mobile maps. The following is the logic:

  - If the *Force the GIS Web Map to always open to the default extent* system setting is FALSE

    - If there is an extent saved from the previous web map session it will use that

    - Else the initial extent is the full extent of all layers in the map

  - If the *Force the GIS Web Map to always open to the default extent* system setting is TRUE

    - If any services in the web map were flagged as the Default Extent (this is set on the Map Edit form)- the full extent of that service will be used

    - Else if the system default extent was set (this is set on the Map Setup form)- that extent will be used

    - Else the initial extent is the full extent of all layers in the map

- When clients upgrade to version 2015, the current extent will be empty. The clear extent button can be sued if there is already an extent set and the user wants to remove it so there is no longer a default extent.

To set a default extent:

1. Enter the url to the service or to an individual layer within the service that contains the extent you wish to use. For example:

    - Point to an map or feature service, then it will use the Full Extent property of the service
        - http://lct-arcsrv-01:6080/arcgis/rest/services/LucityGISDev_SewerWaterStorm/MapServer

    Full Extent:

    XMin: 750661.7811679803
    YMin: 844378.6916010529
    XMax: 759887.8028215207
    YMax: 850726.8290682435
    Spatial Reference: 2868 (2868)

    - Point to an individual layer it will use the Extent property of the layer
        - http://lct-arcsrv-01:6080/arcgis/rest/services/LucityGISDev_SewerWaterStorm/MapServer/4

    Extent:

    XMin: 756953.4137139097
    YMin: 845633.4845800549
    XMax: 758526.169947505
    YMax: 849081.3533464596
    Spatial Reference: 2868 (2868)

2. After entering the url, click the Calculate Extent button. This will retrieve the extent information from the service and enter this into the next text box.

    - Note: If the user new the extent they would like to use, they can manually enter the extent in the text box, by checking the Manually Enter checkbox.

3. Click the *Save As New Extent* button to update the system setting with the calculated extent.

Group Assignment

- Version 2015r2 added the ability for a user group to be associated with multiple maps. Previously, a user group could only be associated to one map.

- Now users can only view/access web and mobile maps that have been associated to user groups that they are part of.


To assign groups to a map:

1. On the Map Setup form, select the desired map under the Map section.

   - The Group Assignment header will be updated to indicate the selected map name.

   - The *Groups assigned to this map* list box will also be updated to show all the groups currently assigned to the selected map

2. In Available Groups list box, select the group(s) that you want to associate with the selected map and press the Assign Group(s) to Map>> button.

3. Likewise, if there are groups currently assigned to the map that you wish to remove select them from the *Groups assigned to this map* list box and press the Un-Assign Group to Map << button.

To set the default map for a group:

1. On the Map Setup form, select the desired map under the Map section.

   - The Group Assignment header will be updated to indicate the selected map name.

   - The *Groups assigned to this map* list box will also be updated to show all the groups currently assigned to the selected map

2. In Available Groups list box, select the group(s) that you want to set the default map for.

   - The *Default web map for group []* and the *Default mobile map for group[]* will be updated to show what the current default is for the selected group

3. Click the *Set this map as web default for group[]* and/or *Set this map as mobile default for group []* button to set the new group default map.

GIS Map Edit
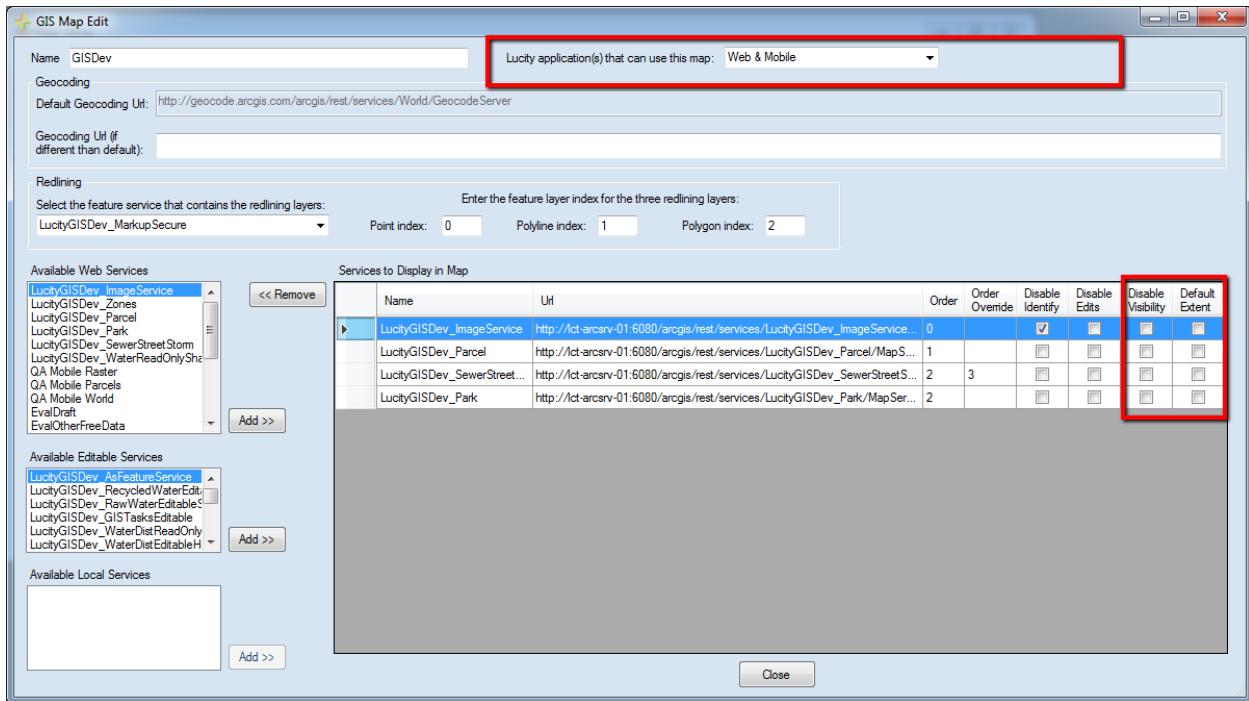
The following changes were made to the GIS Map Edit form for versions 2015 and 2015r2

- There is a new drop down at the top of the form to indicate which Lucity application(s) can use this map. (v2015)
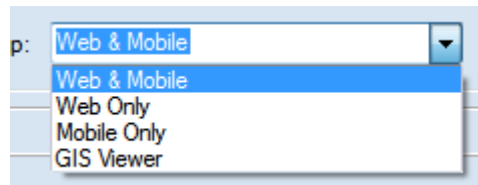
- o When upgrading to version 2015, existing non-GIS Viewer maps will have this property set to Web & Mobile

- The *Use As Default* checkbox was removed. This functionality is on the Map Setup form, since multiple user groups can be assigned to each map. (v2015r2)

- In the Services to Display in Map grid, there are two new properties that can be checked:

  - o Disable Visibility

    - ▪ This is a new option at v2015 that allows the user to disable the visibility of a service by default.

  - o Default Extent

    - ▪ This is a new option at v2015 that allows the user to use the extent of the service as the initial extent of the map.

    - ▪ Note: Only one service can be marked as the default extent for each map.

GIS Config

This is a new tool added in version 2015 to configure ArcGIS online-hosted services. These are services that the underlying data is hosted by Esri. In other words, the GIS data is off-premise not being published via the client's ArcGIS for Server.

To use the tool:

1. In the Administration tool, select GIS>GIS Config. The ArcGIS Online login window appears.
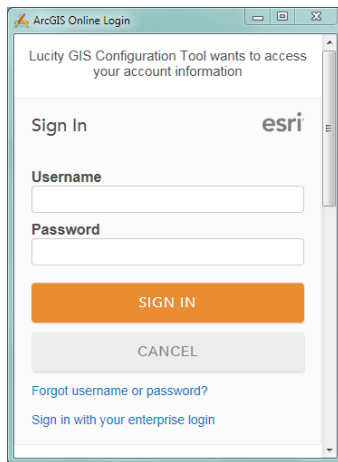
2. Enter your ArcGIS Online username and password and click Sign In.

    a. Note: Your login must be associated to your agency inside ArcGIS Online. This tool connects to your ArcGIS Online account and provides a list of services available to the connected user; therefore, you must connect as a user that has access to all layers that need to be linked to Lucity.

3. Once logged in the GIS Configuration Tool dialog will appear:
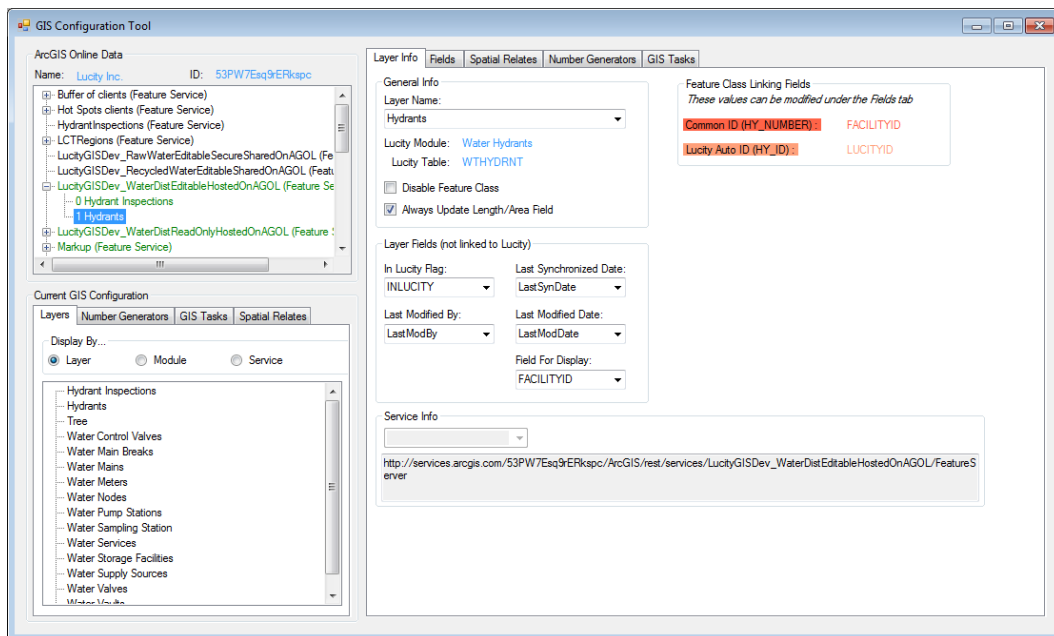
There are three sections to the tool:

- ArcGIS Online Data
    - o This section displays information about your ArcGIS Online organization.
- Current GIS Configuration
    - o This section provides an overview of the entire configuration linked to Lucity
- Feature Class Configuration
    - o This section displays the configuration information about the layer selected in either the *ArcGIS Online Data* or *Current GIS Configuration* sections.

ArcGIS Online Data

- Added in version 2015
- This is used with the new geocoding method to help limit the results especially if using a broad locator service such as Esri's World Geocoding Service.

One way to validate a service is to run the Test Connections button found in the Edit Map Service section of the Connection Properties tab for the geodatabase. This test will:

- Validate a connection can be made to the service with the URL and credentials provided
- Analize each layer wihin the service to determine if it has a conneciton to Lucity.
- Results including any errors are reported in the validation results form. An example of the results are shown below.

The other map and feature service tests occur as part of the Validation tools that are available in the geodatabase and feature class menus.
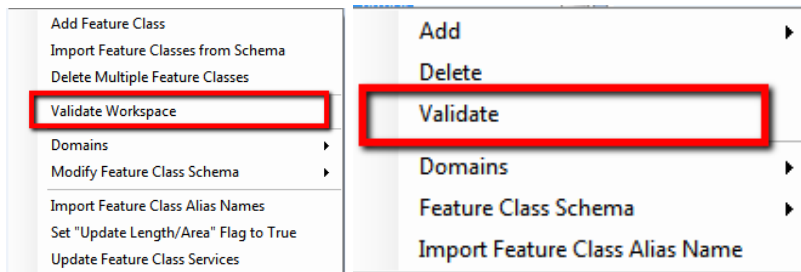
There are three parts of this validation:

1. Validates setup in Lucity. This part checks to make sure required fields are populated, and Lucity fields are valid.

2. Validates setup in geodatabase. This includes testing the connection to the geodatabase. Validates that the feature class exists, fields exist, data types are compatible, etc.

3. Validates setup in map service. **This test is skipped if both the "Use Feature Service For Updates" and "Enable Lucity Spatial" system settings are FALSE.** This section will validate the following:

   a. A connection can be made to the service.

   b. The feature class exists in the service

   c. The feature class fields exist in the service and validates a sample payload

Part of the service validation is to verify the service layer fields exist. The Lucity tools interact with services using the Esri REST API, which field names are case sensitive. If a conflict in case is found during the validation, a prompt similar to the following will appear:
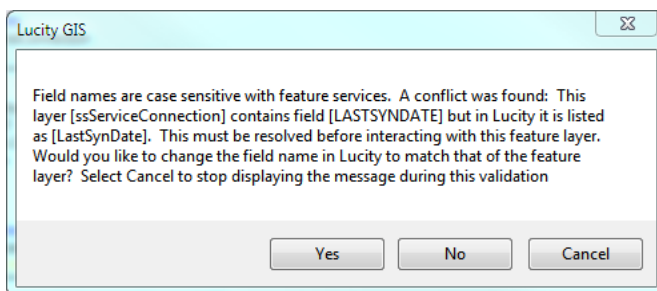

- Yes- will update the case in Lucity.

- No- no changes will be made. Note- this may cause failure when attempting to read or update that field via the map service.

- Cancel- no changes will be made and further case conflicts will be ignored for this validation run.

Once the validation process is complete, you will receive a prompt indicating if the validation passed or not. Refer to the validation results window for specifics. The following is an example of the validation results:
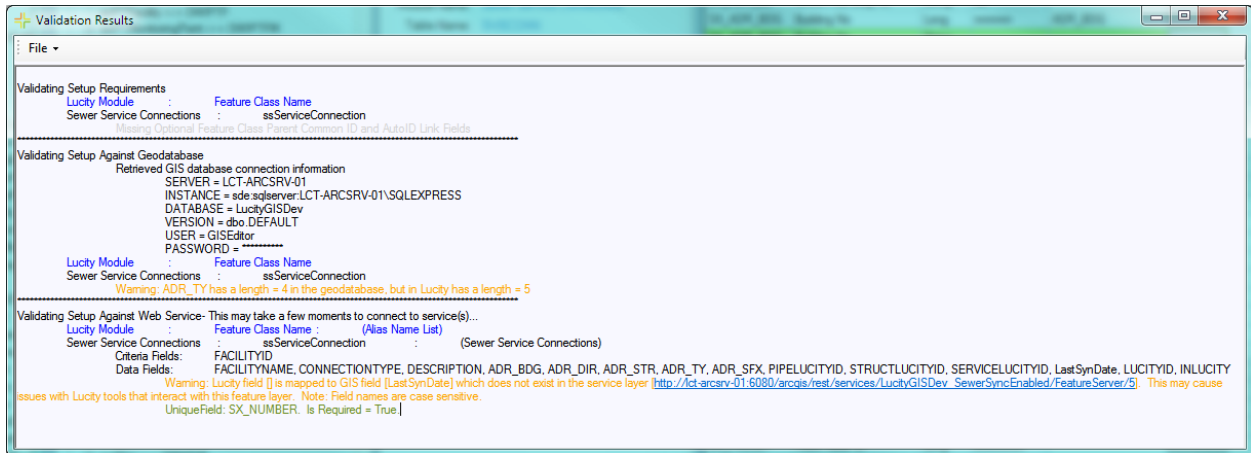
Lucity Web Map Changes
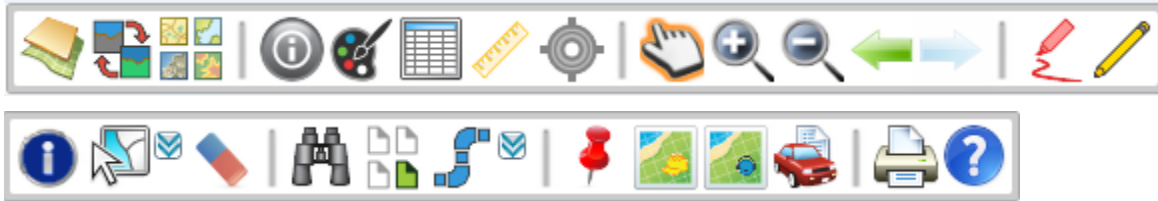
Tools added or modified for 2015

Button	Name	Description
	Trace Tool	Tool now has the option to do sewer and storm traces in addition to the water valve isolation trace

Tools added or modified for 2015r2

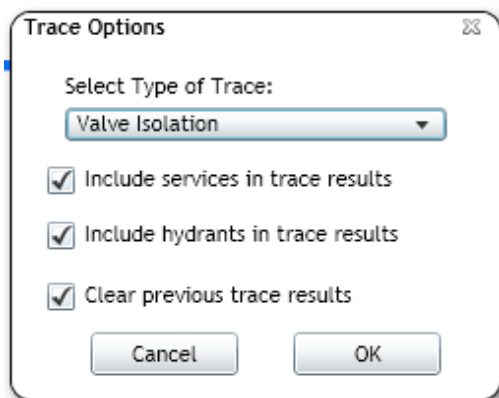| Button	Name	Description
	Find Tool	A select by attribute option has been added to the Find Tool, allowing users to select all features in a layer based on a value in any field
	Swap Web Map	The swap web map tool has been updated to only show maps the user has access to
	Create Work Order	New options were added • Create work order from a template • Create a separate work order for each selected asset, address, and/or xy
	Add to existing PM/Template	A new tool has been added to add items to an existing PM/Work Template

Trace Tool

The trace tool has been enhanced for version 2015 to include tracing capabilities for sewer and storm networks. There are now the following types of traces available with this tool:

- Water: Valve Isolation

- Sewer and Storm: Upstream, Upstream Distance, Upstream Segment, Downstream, Downstream Distance, Downstream Segment

All traces are based on the information as it is listed in Lucity. These trace tools do not require the use of a geometric network or other spatial components in the web map, the trace is based upon the to/from node information as it is listed in the Lucity asset inventory module for the pipe.
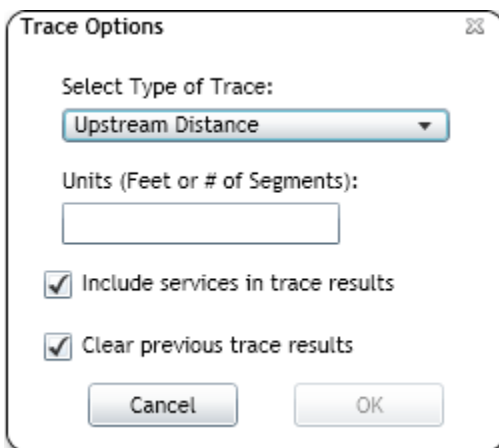

Water Valve Isolation Trace

The valve isolation trace gives the user the option to include services and hydrants in the results. In order for the hydrants and services to be included, the hydrant/service record in Lucity must have the related pipe ID field populated.

Sewer and Storm Trace

The sewer and storm trace provides the user with the option to include services in the results. For upstream/downstream distance or segment traces there is an additional field provided for the user to specify the feet or segments to trace.

The *Clear previous trace results* option will clear any existing trace results in the map. This allows the user to continue the trace in scenarios such as with a valve isolation trace where the user knows the valve is not accessible and/or functional and that they want to continue the trace past that valve.

When the trace completes a message will appear similar to the following and the features will be selected in the map and will be included in the feature data grid:
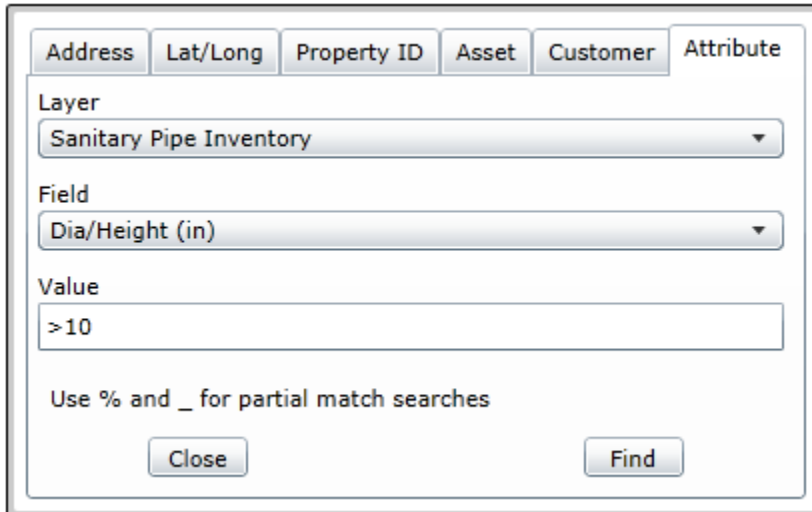
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Select by Attribute

A new option was to the Find tool 🔍 in the web map that allows the user to query a layer in the map based upon field criteria.

The Attribute tab of the Find Tool Dialog allows you to find all the records for a layer in the map that contains the user-specified value for one of its fields.

- Layer: This contains a list of all the layers in the map that are selectable and identifiable.
- Field: This contains a list of all the fields for the specified layer.
- Value: The value that will be used in the search criteria. The following shows some advanced techniques:
  - For numeric fields you can use >, <, >=, <=
  - For string fields: % can be used for a partial search. For example:
    - 1168% returns 1168, 116800, 1168ab, 116888_8
    - 11%00 returns 113500, 11100, 11aaa00
  - For string fields: _ can be used for a partial search. For example:
    - 1168_0 returns 116800, 116860, 1168a0

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Create Work Order

With version 2015r2, a couple new options are available when you create a work order from the web map. One option allows you to create a work order using a PM/Work Template the other option is if there is more than one asset/address/coordinate selected you can create a separate work order for each item.

If there is more than one asset, address, or coordinate highlighted in the feature data grid, then you will receive a dialog similar to above prompting confirming that you want to create the work order(s) for the Selected Records or All records in the grid.

The second option indicates if you want to create one work order with all assets/addresses/coordinates or if you want to create a separate work order for each asset/address/coordinate.

Finally, if there are any PM/Work Templates associated with the selected asset type, then you will have the option to select a template from the grid. This option will use the properties from the work template when creating the work order.

Add to Existing PM/Work Template

A new tool has been added to the Identify and Data Feature Grids in the Lucity web map that behaves similar to the Add to Existing Work Order tool in which you can enter the PM/Template code and the selected asset(s) will be added to the PM/Template.

To add selected items to an existing PM/Work Template you would either need to enter the code in the text box provided, or from Lucity web, choose the option to Add Items from the Webmap, which will automatically populate the text box with the current PM/Work Template.

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