# Building a Survey123 design using a secure workflow

Before you start – read the key principles of Survey 123 secure workflow design below and then move onto section.

Key principles of a secure workflow

For this workflow, we need a Survey123 form which can be shared publicly, so that anyone can add submit data without an Esri licence, but with the results hidden from the public due to data security considerations. This requires a secure workflow for Survey123 Connect which is an advanced method. Because Survey123 does not handle data views and folders well (or as you may logically expect), it is critical to ensure that you have the correct settings otherwise you risk data being lost, or sensitive information being shared (GDPR breach).

If you read one thing before you start – read this:

Folders in ArcGIS Online and Survey123 Connect are linked. If you delete a survey in
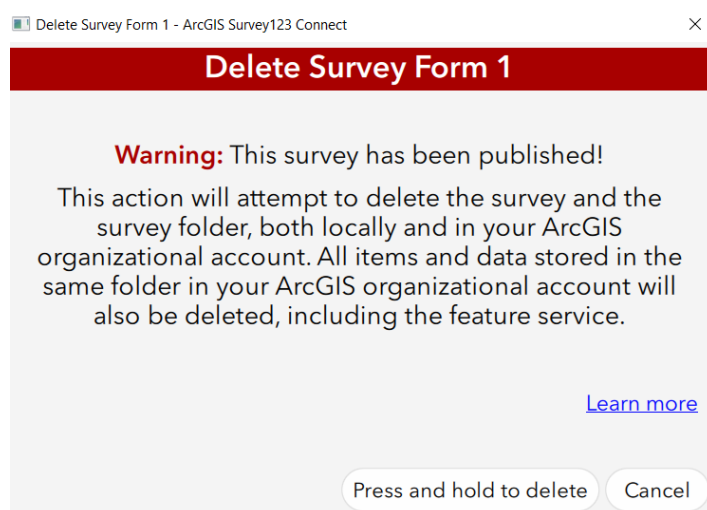
Survey123 Connect you will delete any data that is not delete protected in ArcGIS Online, even if you moved it there only to store it and it is nothing to do with the survey. This is a bug which has been raised with Esri and they are looking to resolve. You will be shown the message in Figure but it is an easy mistake to make so beware and ensure any data stored in the folder (hosted feature layer, web maps) is delete protected.

Figure 1 Survey123 Connect warning message for deleting survey – also deletes any ArcGIS Online content stored in the automatically generated folder.

Another key step for this workflow is to ensure that you have the data schema finalised before you start creating view layers. This is because if the survey is configured with views, you will not be able to change the schema and republish the survey without losing data in the survey and/or some complex data management steps. Ensure you check the survey sharing settings on the online layers are as intended every time you republish the survey to avoid sharing data unintentionally. This is very important if you have sensitive data in the survey.

Check latest guidance from Esri. At time of writing November 2021, the content here is valid, but Survey 123 and ArcGIS Online are regularly updated. See the Esri document Limiting Access to Public Survey123 responses. Also see the article Securing data in public surveys (Survey123 Connect) which gives a useful summary of the steps to take in producing a secure survey and the layers you should produce to do this.

Key principles summary:

- Republishing a survey from Survey123 Connect can reset the sharing settings on any associated layers – check the sharing settings on the layers after you republish the survey.
- Deleting a survey in Survey123 Connect will delete any autogenerated folders and data stored in them in ArcGIS Online.
- Survey123 does not handle view layers well – ensure you schema is finalised before you start making view layers.

Steps in setting up the Survey123 form and security settings

1. Set up the survey schema and questions in Survey123 Connect and publish from Survey123 Connect.
2. In ArcGIS Online create a new folder for any content you create. Do not use the auto generated folder to store content because it is not treated in the same way as ordinary folder by ArcGIS Online (see Key principles). Keep only the survey in this folder and ensure that it has delete protection enabled (see Figure).
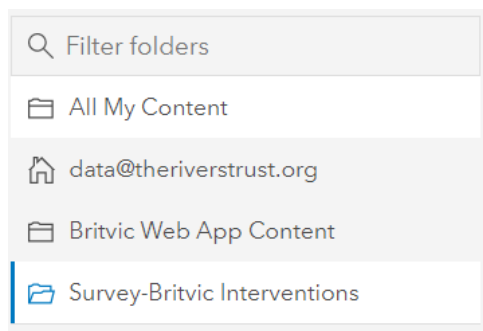

Figure 2 Example folder structure in ArcGIS Online

3. In ArcGIS Online create a view layer from the hosted feature layer which was published by the survey from Survey123 Connect.
4. Add delete protection to all files in the survey folder in ArcGIS Online.
5. Create a new survey in Survey123 Connect from the hosted feature layer – name it something like 'tempdelete'. You will only use this to copy some details to the original survey form.
6. Go to the settings tab in the xlsx sheet 'tempdelete' and copy the settings from the settings tab, see Figure 3 copying item details from xlsx form. Paste these details into the original survey form. You no longer need this form called

Figure 3 copying item details from xlsx form.

'tempdelete' so you can now remove it.
7. Set the settings under 'Share survey' on Survey 123 to the following (see Figure). Note, check after saving if it has actually changed the 'only add new records'. Sometimes it reverts, and though not advised by Esri in their documentation, you will need to change these settings on the hosted layer

instead of survey 123 and then it will allow you to save. Set the share results
settings to those illustrated in Error! Reference source not found.

Figure 4 Survey123 settings

Figure 5 Share results settings

Creating view layers and settings

It is important/best practice that you do not have the hosted feature layer shared publicly. Instead, this layer should be protected by making it private. View layers can be configured to allow data to be shown at the levels appropriate for each component of the web app with the public or certain groups of users.

You will need to have at least two view layers to create a secure workflow. The following view layers are used in this example with settings shown.

Feature Layer (hosted) - original layer settings

This is the original 'root' layer for the project. This layer's sharing settings should be protected by making it 'private'. Slightly unintuitively, we need to match the other settings of this layer to the view layer which has been used as the URL submission in the Survey123 Connect form which will be set to public. Don't worry, as long as the layer is still set to private – the layer is secured regardless of these settings (see Figure 1 Settings for the hosted feature layer). If these settings don't match between the hosted feature layer and the view layer which is used as the URL submission in the survey, there will be a submission error. For more information, see this post here about this error.

Feature layer (hosted, view) – layer for submission URL settings

This is the view layer which is used as the submission URL in the Survey Connect XLSX form. This layer's sharing settings should be set to public. See steps (Steps in setting up the Survey123 form and security settings). Check that the settings match those below in figure 7, but that they are also identical to those in Survey123 Browser (see Figure 4 Survey123 settings). Namely, that no one can see/interrogate the data in the layer.

Feature Layer (hosted, view) – layer for web apps settings

This is the feature layer view which will be shared with the public in various parts of the web app we are going to create. This view layer should have editing switched off and use the values in Error! Reference source not found.. Settings should also be set in the Visualisation Tab (see Figure 9) so that only approved data is viewable publicly. This is done by including a field which is used to filter data based on whether administrator has approved the entry. In this case, there is a field called 'approval' with coded value domains of 'yes' and 'no'. This is a quality assurance process which protects the public view from unwanted data e.g., personal data 'names', or offensive content in the free text fields.

General

Content Status

Recommend the use of this item.

Mark as Authoritative

Discourage the use of this item.

Mark as Deprecated

Delete Protection

☑ Prevent this item from being accidentally deleted.

Delete Item

Public Data Collection

☑ Approve this layer to be shared with the public when editing is enabled.

If the public does not require editing on this layer, consider either disabling editing or creating a read-only view layer to share with the public. Disabling editing also improves performance, especially when sharing with the public.

Extent

Set an extent to make your item searchable by location.

Edit Extent

Feature Layer (hosted)

Save   Cancel

Editing
☑ Enable editing
☐ Keep track of created and updated features.
☑ Keep track of who created and last updated features.
☑ Enable Sync (required for offline use and collaboration).

• Who can edit features?
Share the layer to specific groups of people, the organization or publicly via the Share button on the Overview tab. This layer is not shared.

• What kind of editing is allowed?
☑ Add
☐ Delete
☐ Update

• What features can editors see?
○ Editors can see all features
○ Editors can only see their own features (requires tracking)
◉ Editors can't see any features, even those they add

• What features can editors edit?
◉ Editors can edit all features
○ Editors can only edit their own features (requires tracking)

• What access do anonymous editors (not signed in) have?
◉ The same as signed in editors
○ Only add new features, if allowed above (requires tracking)

• Who can manage edits?
▫ You
▫ Administrators
▫ Data curators with the appropriate privileges

Manage Spatial Indexes   Rebuild Indexes
If your data changes frequently, rebuilding the spatial index can increase performance when drawing features on the map.

Cache Control

When a layer is shared with the public, it is cached by a Content Delivery Network (CDN). A CDN can dramatically decrease latency when delivering your content around the globe. This improves the map load time and the responsiveness of apps, and leads to a better user experience. By default, the CDN regularly checks the feature layer to make sure the CDN cache is current. You can further improve performance by increasing the length of time that the current cache is considered valid. If you do this, public users viewing the data will not immediately see edits made to the data and will have to wait longer to see the updates. Learn more.

What is the longest time you want your users to wait before seeing updates?   Never

Figure 1 Settings for the hosted feature layer

Figure 6 – settings for the hosted feature layer.

Content Status

Recommend the use of this item.

Mark as Authoritative

Discourage the use of this item.

Mark as Deprecated

Delete Protection

☑ Prevent this item from being accidentally deleted.   Delete Item

Public Data Collection

☐ Approve this layer to be shared with the public when editing is enabled.

If the public does not require editing on this layer, consider either disabling editing or creating a read-only view layer to share with the public. Disabling editing also improves performance, especially when sharing with the public.

Extent

Set an extent to make your item searchable by location.   Edit Extent

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Feature Layer (hosted, view)

* Setting must be configured on the hosted feature layer that this feature layer view was created from, Britvic Interventions v2.

Editing
☑ Enable editing
☐ Keep track of created and updated features. *
☑ Keep track of who created and last updated features. *
☐ Enable Sync (required for offline use and collaboration). *

• Who can edit features?
  Share the layer to specific groups of people, the organization or publicly via the Share button on the Overview tab. This layer is currently shared with: Everyone (public)

• What kind of editing is allowed?
  ☑ Add
  ☐ Delete
  ☐ Update

• What features can editors see?
  ○ Editors can see all features
  ○ Editors can only see their own features (requires tracking)
  ● Editors can't see any features, even those they add

• What features can editors edit?
  ○ Editors can edit all features
  ● Editors can only edit their own features (requires tracking)

• What access do anonymous editors (not signed in) have?
  ● The same as signed in editors
  ○ Only add new features, if allowed above (requires tracking)

• Who can manage edits?
  ◦ You
  ◦ Administrators
  ◦ Data curators with the appropriate privileges

Cache Control

When a layer is shared with the public, it is cached by a Content Delivery Network (CDN). A CDN can dramatically decrease latency when delivering your content around the globe. This improves the map load time and the responsiveness of apps, and leads to a better user experience. By default, the CDN regularly checks the feature layer to make sure the CDN cache is current. You can further improve performance by increasing the length of time that the current cache is considered valid. If you do this, public users viewing the data will not immediately see edits made to the data and will have to wait longer to see the updates. Learn more.

Figure 7 settings for hosted feature layer view for URL submission

Feature Layer (hosted, view)

Hosted Feature Layer View

Update the definition of your hosted feature layer view, or add and remove layers from the view.

[Update View]

* Setting must be configured on the hosted feature layer that this feature layer view was created from, Britvic Interventions.

Editing

☐ Enable editing
This layer is shared with the public. If you enable editing, anyone, including the public, can edit the layer. To allow public editing of this layer, you must first approve it for public data collection by turning on the setting above. If this is not your intent, unshare the layer and then enable editing.

☐ Keep track of created and updated features. *

☑ Keep track of who created and last updated features. *

☐ Enable Sync (required for offline use and collaboration).

Cache Control

When a layer is shared with the public, it is cached by a Content Delivery Network (CDN). A CDN can dramatically decrease latency when delivering your content around the globe. This improves the map load time and the responsiveness of apps, and leads to a better user experience. By default, the CDN regularly checks the feature layer to make sure the CDN cache is current. You can further improve performance by increasing the length of time that the current cache is considered valid. If you do this, public users viewing the data will not immediately see edits made to the data and will have to wait longer to see the updates. Learn more.

What is the longest time you want your users to wait before seeing updates?   [30 Seconds ▼]

Export Data
☐ Allow others to export to different formats.

General

Content Status
Recommend the use of this item.

[Mark as Authoritative]

Discourage the use of this item.

[Mark as Deprecated]

Delete Protection

☑ Prevent this item from being accidentally deleted.

[Delete Item]

Public Data Collection

☐ Approve this layer to be shared with the public when editing is enabled.

If the public does not require editing on this layer, consider either disabling editing or creating a read-only view layer to share with the public. Disabling editing also improves performance, especially when sharing with the public.

Extent

Set an extent to make your item searchable by location.

[Edit Extent]

Figure 8 settings for the hosted feature view layer which is used in public web maps & apps
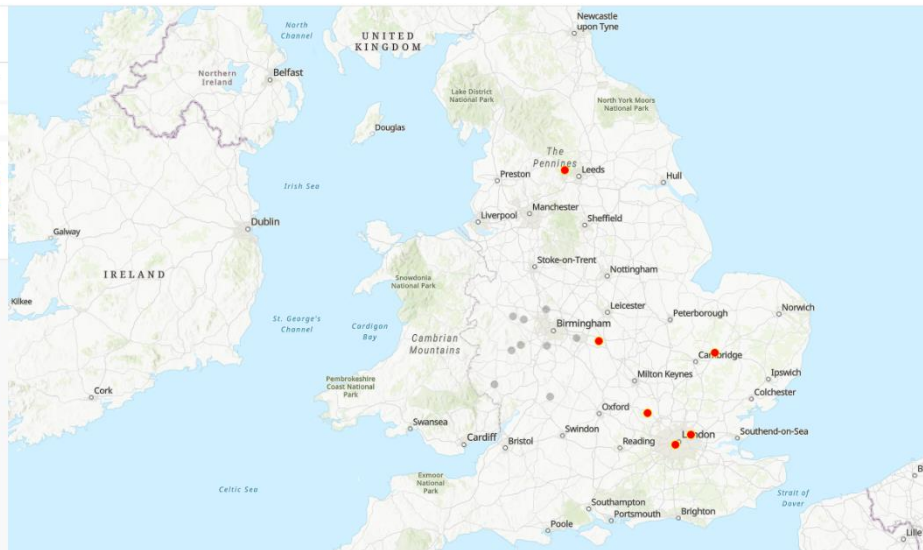
Figure 9 view layer settings to filter out data which has not been approved. Notice the grey dots which have not been approved, they will not appear in the table of attributes or map when members of the public view this data.