

# Maps, Mapping, and Geospatial Technologies

**Title:** Field Collection

**Due Date:** March 6, 2023 at 11:59 pm

## Required Resources:

- An internet enabled computer
- A GPS enabled mobile device (e.g., iPhone, Android, iPad)
- Access to the app store (iOS, Android)

## Purpose:

The purpose of this lab is for you to get hands-on experience collecting geospatial data in the field. In this lab, you will build upon previous experience working with ArcGIS Online to create a feature layer, collect data, and create a web application. As you complete the lab exercise today, think about how you could use this in future projects, especially considering the elements of what makes a good web map.

You will also notice that there are fewer cues in the exercise – you can always reach out with any questions ([jxsigm@rit.edu](mailto:jxsigm@rit.edu)), but I would like to challenge you to learn more about the software and the methods, tools, and operations to complete your tasks. **There were a series of recorded videos included in the Week 6 Lecture that you can refer back to as well but be sure to note where different approaches should be made!**

## Learning Objectives:

- Collect data in a shared feature layer to capture GPS Metadata
- Create a feature layer
- Create a custom web application in ArcGIS Online using the Web AppBuilder

## Deliverables:

This week, your primary deliverable will be a web app created in ArcGIS Online and collected feature points using ArcGIS Field Maps. There are additional questions which should be submitted as a write-up. Upload your write up to the lab assignment on myCourses. All the tasks below should be included in the same word document (or PDF). Name your write-up using this convention before posting:

[your last name]\_Week6\_lab.docx

**Don't forget to include the link to your web app in the write up!!!**

## Grading:

This assignment will be graded out of **25** points. The number of points for each task is noted in the description of each task.

### Task 1: Collect Data in the Field Using Field Maps (5 points)

#### *Step 1: Download the ArcGIS Field Maps App*

For this task, you will collect data in the field using the ArcGIS Field Maps app. You will be collecting at least one point to see what GPS metadata is collected.

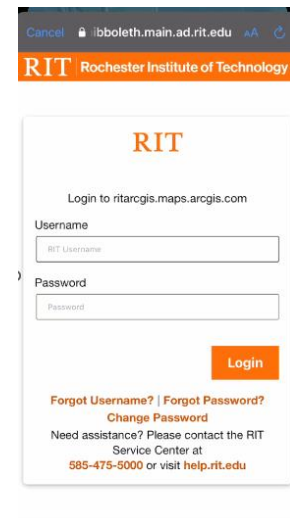
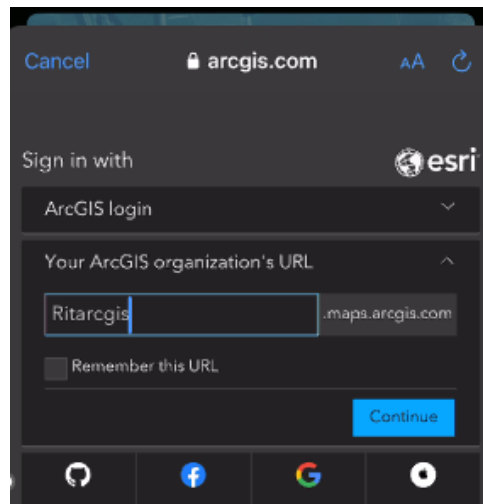
You will need to [download](#) to your mobile device (available on the App Store and Google Play). If you have an issue downloading the app, reach out to your instructor as soon as possible.

After you have downloaded the application, follow these instructions to sign in:

1. Sign in with ArcGIS Online

2. Select “Your ArcGIS Organization’s URL: **ritarcgis**”

3. Log in with your RIT credentials

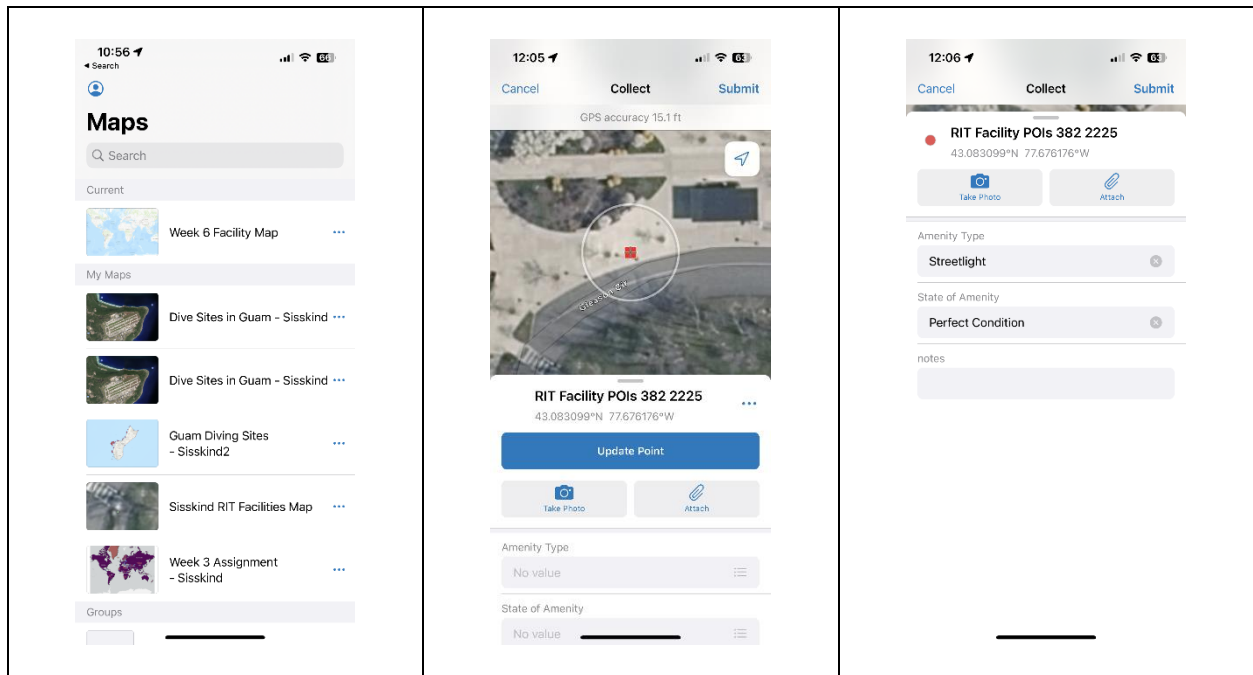


Once you are signed in, you should see a list of available maps. This should include the map you completed in a previous assignment.

#### *Step 2: Collect Data!*

1. Select the **Week 6 Facility Map**. It should load in your application, and you should see a blue dot reflecting your GPS location.
2. You will be collecting one of three features: benches, flower pots (the large ones), or street lights.
3. To collect a feature, choose the blue plus sign in the bottom right corner.

4. Collect the attribute information about the feature. If the flower pot is empty, it may not be in perfect condition. Consider if a bench is covered in snow or has chipped paint. Is the street light bulb working?
5. In the notes field, add your name.
6. Add a picture to your collection as well.
7. Hit **Submit**.
8. Look at the feature – you should see all the GPS metadata collected, including latitude and longitude of your location.
9. **Repeat this process 3-5 times.**
10. **Reach out if you had any issues, as this process is critical for Task 2 of this assignment.**



## Task 2: Collect Data in the Field Using Field Maps (20 points)

The images shown were used to create the Feature Layer for Task 1.

### *Step 1: Create your feature layer*

1. Go to the RIT ArcGIS Online home page (<https://ritarcgis.maps.arcgis.com/home/index.html>) and select **Content**.
2. In the upper left, select **New item** and choose **Feature Layer**. Select **Define your own layer**.
3. Give your layer a name – it could be generic if you are planning on collecting different features (“Amenities”) or specific if you are going to focus on one feature type (“Fire Hydrants”).
4. Leave “Add GPS metadata fields” and “Enable Z-values” off.
5. Once the layer is created, select it in the **Overview** window.

Edit thumbnail

Feature layer for field collection around RIT Campus. To be used during IGME 382 Spring 2023. Edit

Feature Layer (hosted) by [jxsgm@rit.edu\\_RITArcGIS](#)

Item created: Feb 21, 2023 Item updated: Feb 21, 2023 View count: 2

Add to Favorites

Description

Add an in-depth description of the item.

Layers

IGME 382-2225 RIT Facility POIs  
Point layer

Terms of Use

Open in Map Viewer

Open in Scene Viewer

Open in ArcGIS Desktop

Publish

Create View Layer

Export Data

Update Data

Share

Item Information

Learn more

Low High

Top Improvement: Add a description

6. Ensure that the layer can accept attachments.

## Attachments

Enable Attachments



7. While in this window, create a brief description of the layer based on what you are planning on collecting.

### Step 2: Add Fields to your Feature Layer

1. Select **Data** from the top ribbon, and then select **Fields** in the upper right side.

Overview Data Visualization Usage Settings

Table Fields

Table Default Filter

2. You should see a button in the upper left side to **Add** a field. Select it.
3. Create a new field based on the **amenity type** you are planning on collecting. You should create the field using the **integer** type and then create a custom list using coded values. See the example below – but create your list based on what you want to collect. I would recommend something from the following list as they should be easy to find and collect around campus, but feel free to be creative and collect any feature types that a facilities team would want to know about. Remember also that you will be collecting information on the state of the item (e.g., is it damaged, does it need repair, etc.), so be sure your amenity can be categorized that way.

Some examples: fire hydrants, trash cans, recycling bins, potholes, streetlights, parking meters, ...

### Add Field

Field Name:

Display Name:

Type:

Default Value: (Optional)

Allow Null Values: ☒

### Amenity Type

**Description**

A brief summary of the item is not available.

**Field Value Type**

Field Value type is not available.

**Settings**

|                         |      |                                     |
|-------------------------|------|-------------------------------------|
| Allows Null Values      | Yes  |                                     |
| Editable                | Yes  | <input type="button" value="Edit"/> |
| Default Value           | None |                                     |
| Length                  | None |                                     |
| Minimum / Maximum Value | None | <input type="button" value="Edit"/> |
| Unique                  | No   | <input type="button" value="Edit"/> |

**Details**

Type: Integer  
Name: amenityType

| Label                                    | Code                           |                                           |
|------------------------------------------|--------------------------------|-------------------------------------------|
| <input type="text" value="Bench"/>       | <input type="text" value="0"/> | <input type="button" value="Delete"/> (0) |
| <input type="text" value="Flower Pot"/>  | <input type="text" value="1"/> | <input type="button" value="Delete"/> (0) |
| <input type="text" value="Streetlight"/> | <input type="text" value="2"/> | <input type="button" value="Delete"/>     |

+ Add

4. Repeat this process to add fields to capture the state of the amenity (use **amenityState** as the field name), using the following codes:

| Label                                          | Code                           |                                       |
|------------------------------------------------|--------------------------------|---------------------------------------|
| <input type="text" value="Perfect Condition"/> | <input type="text" value="0"/> | <input type="button" value="Delete"/> |
| <input type="text" value="Great Condition"/>   | <input type="text" value="1"/> | <input type="button" value="Delete"/> |
| <input type="text" value="Good Condition"/>    | <input type="text" value="2"/> | <input type="button" value="Delete"/> |
| <input type="text" value="Fair Condition"/>    | <input type="text" value="3"/> | <input type="button" value="Delete"/> |
| <input type="text" value="Poor Condition"/>    | <input type="text" value="4"/> | <input type="button" value="Delete"/> |

5. Repeat this process again to create a field to capture if the amenity needs to be repaired. Name this field **amenityRepair** and use coded values again (0 for “No”, 1 for “Yes”).
6. Next, add a **String** field for Notes.
7. Finally, add any additional fields you would like to collect (e.g., paint color, indoor/outdoor, name of feature, etc.).

### *Step 3: Create a Map*

1. Go back to the **Overview** tab and select **Share**. Change the sharing level to **Organization** and share with your class under **Set Group Sharing**.

Share

Set sharing level

☐ Owner  
Owner of the item(s) has access

☒ Organization  
All members of your organization have access

☐ Everyone (public)  
People outside your organization have access

Set group sharing [Remove](#)

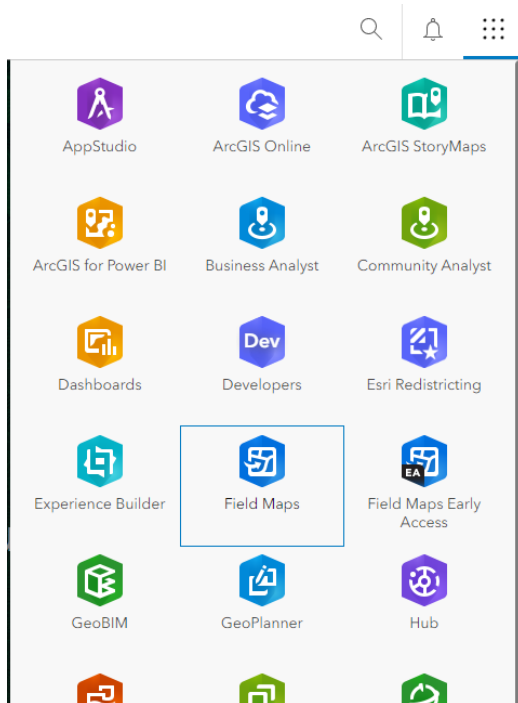
[Edit group sharing](#)

[Save](#) [Cancel](#)

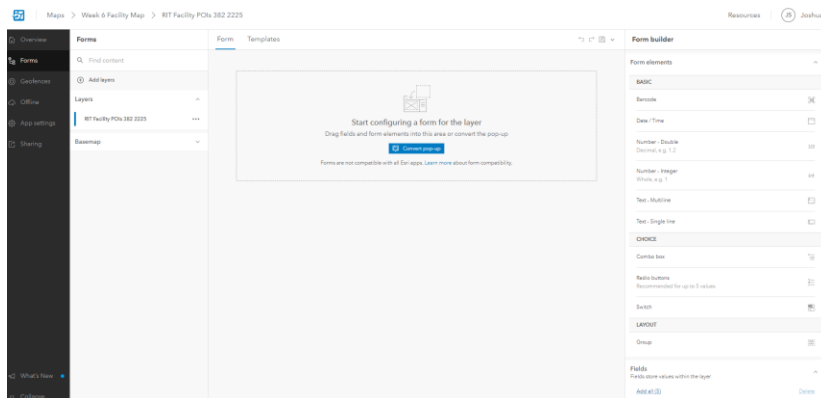
2. Select **Open in Map Viewer**. Your layer should automatically open in a map window.
3. Depending on the type of map you are creating, symbolize by **Amenity Type** or **Amenity State** (or both!). No matter which type of map you are creating, your symbology should accurately represent your features (e.g., stop sign icons for stop signs, green for no repair needed vs. red for repair needed, etc.). Refer to past assignments or the web map in Task 1 for inspiration (or reach out and ask!). There is a demonstration of this in the **Week 6** lecture as well.
4. Once your symbology is set, save and share your map as you did with the feature layer. The title of your map should be **{LastName} Week 6 Map**.

### *Step 4: Configure Field Maps and Collect Data*

1. Go back to the RIT ArcGIS Online home page and select the nine-dot menu. Select Field Maps to open the application.



2. Select the web map you just created and saved. If you do not see it, make sure you have saved it correctly.
3. After selecting the map (click directly on it), a tab with a blank form should open in your browser. It should look something like this:



4. Scroll down on the right hand side to **Fields** and click on **Add all**.
5. Selecting on each field will give you a chance to update the options that will be presented to the user. You can change the **Display Name** to be in the form of a question (e.g., “Does this feature need repair?”).
6. Change any Yes/No fields to use the **switch** option instead of a **combo box**.
7. If any lists have 3-5 options, you can choose to change to a **radio button**.
8. At least one field should use the **Conditional Visibility** option. The best candidate is the **Needs Repair** field, based on the state of the amenity (we can assume if something is in at least great condition, it does not need repair).

- Select the desired field (in my example, it is the **Needs Repair** field) and choose **New Expression** under conditional visibility.
- Change the title to **Repair Required**
- Using the drop down boxes, change the expression to “State of Amenity”, “is not”, and “Perfect Condition”. Note how the **Arcade syntax preview** has updated.
- Now select **Launch Arcade Editor** (bottom right).
- A new tab will load with the Arcade Editor. Change the query so that it will use the coded value and only appear if the feature is less than great condition. Something like...

Expression

```
1 DomainName($feature, "amenityState") >= 2
```

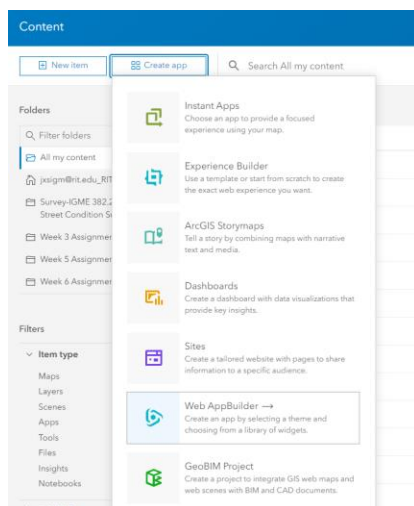
- Select “Test” to make sure your query is valid, then select **OK**.
- Rearrange your fields so that **Notes** is last.
  - Once you are done updating fields, select **Templates**.
  - Select the option, likely called **New Feature** and update the Display Name and Description.
  - Be sure to save one last time!

#### Step 5: Collect Data

- As you did in Task 1, use the Field Maps app on your mobile device to collect **at least 10 points**.
- Include a picture of the feature when you are collecting the data.

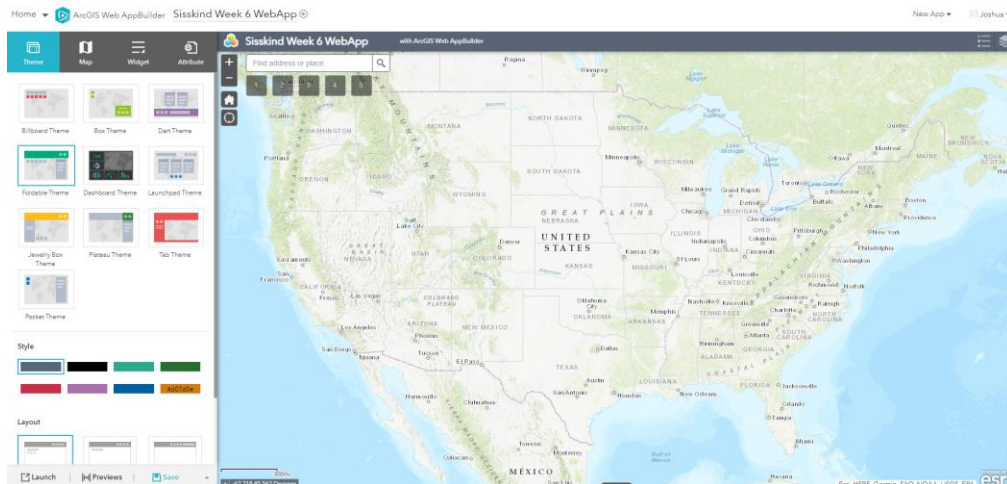
#### Step 6: Create Web App

- Go back to the ArcGIS Online Content page (either by going to the home page or by clicking on the menu button in the upper left hand corner).
- Select **Create App** and choose **Web AppBuilder**.

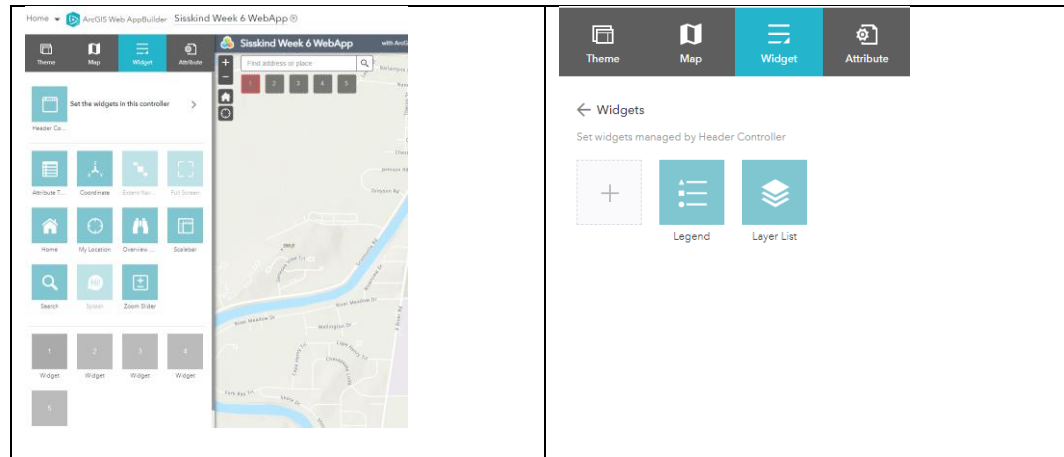






3. Give your app a title of **{LastName} Week 6 WebApp** and select **Ok**.
4. The ArcGIS Web AppBuilder will now load in a new window.




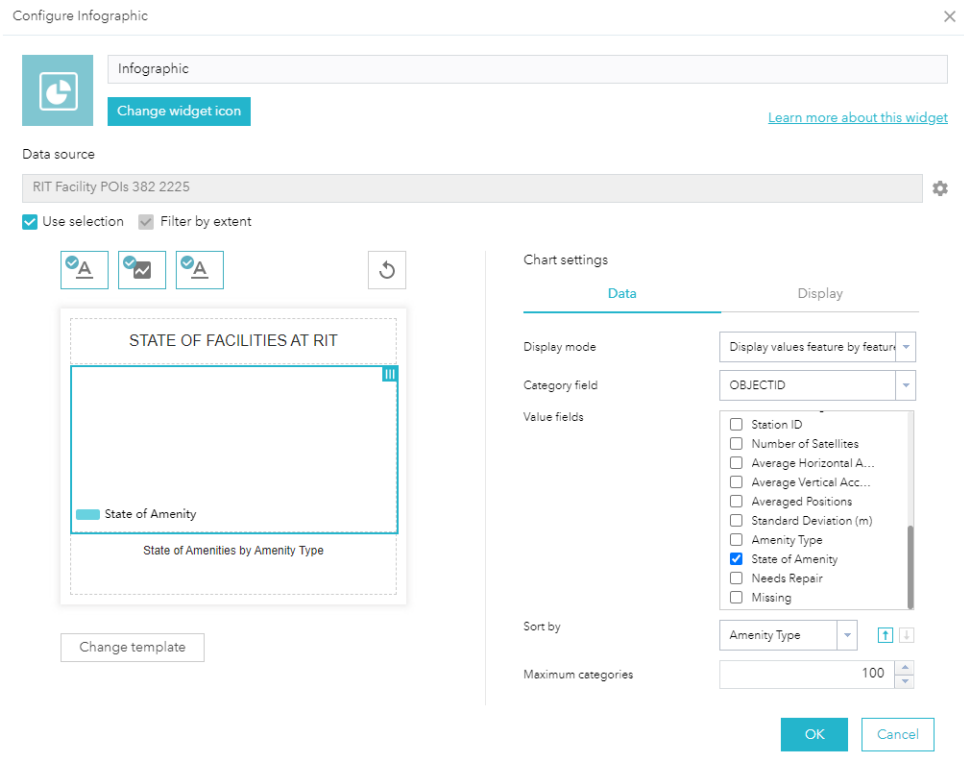


5. Select a theme, style, and layout. Be as creative as you want! You can also go back and change but remember to keep saving!
6. Select **Map** and **choose web map**, selecting the map you just created in the previous step. If it is not there, go back and make sure you saved it.
7. Zoom into RIT in the map and then select **Use current map view**. Alternatively, if you set the extent of the feature layer (as shown in the lecture) you can choose the **Use web map's default extent**.
8. Select **Widget**. There may be a few already selected (legend, layers). Before selecting a widget, determine if you want it to appear in one of the "shortcut" locations (gray boxes with a number) or in the toolbar.
  - a. If you want it to appear in the shortcut spot, click on the number (you should see that spot appear red when you hover over it).
  - b. If you want it to appear in the toolbar, select "Set the widgets in this controller", then the plus sign.



9. You have complete freedom to choose which ever widget you want – but you must **choose at least two custom widgets in your web app**. Custom widgets should be something beyond the norm – legend, layer list, etc. These are the interactive elements in your web map. Here are a few examples if you need inspiration:

|                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Query</p>         | <p>You can use the <b>query</b> widget to configure one or more queries on your data. Select “new query” and your map. You can customize how the results will be symbolized. The <b>Filter</b> option sets the query – select the gear wheel to define it. You could make it look something like this to show a user what features are in need of repair:</p> <p><a href="#">+ Add expression</a> <a href="#">+ Add set</a></p> <p>Display features in the layer that match the following expression</p> <div data-bbox="446 1171 1393 1285"> <input type="text" value="Needs Repair (Num"/> is <input type="text" value="Yes"/> <input type="button" value="⚙️"/> <input type="button" value="✕"/> </div> <p><input type="checkbox"/> Ask for values</p> |
|  <p>Smart Editor</p> | <p>You can use the <b>smart editor</b> widget to allow users to update attributes of your features. Selecting the pencil icon under “Actions” in the table allows you to choose which fields are visible and editable.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                                                                        |                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Basemap Ga...</p> | <p><b>Basemap Gallery</b> (may already be in the map – hover over it and select the pencil icon to edit) can let you choose which basemaps are available to the user.</p>                                                                                             |
|  <p>Filter</p>        | <p>Similar to the query widget, use the <b>filter</b> widget based on a condition (Only show items in good condition? Only show specific amenities? Etc...). You can use the label to name the query and the <b>New Filter</b> option to set multiple filters.</p>    |
|  <p>Infographic</p>   | <p>You can use the <b>infographic</b> to display data about your features. For example, how many features are in good condition? This could be a new challenge and a fun one!</p>  |

10. Select the **Attribute** tab to change the logo (by selecting it), Title, and Subtitle of your application.
11. If you haven't in a while...**Save!**
12. Select **Previews** to see what your web app will look like on various devices.

13. When you are ready, select **Launch** to see what your web app looks like on the web! Admire your work!
14. Go back to the **Content** page to make sure your Web App is shared with the Organization and your class group.

*Step 7: Submit Your Work!*

In your deliverable, copy the link to your web application and provide a short observation statement (~100 words) on your experience collecting data in the field. Some prompts to consider:

- Did weather or buildings have any impact in collecting data?
- Was it easy to create new features?
- How would you have changed your form to make collection easier?