Do-It-Yourself Geo Apps MOOC

Exercise

Identify Bike Parking Locations on a Smartphone

Section 5 Exercise 1

April 8, 2021

esri
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Identify Bike Parking Locations on a Smartphone

Instructions

Use this guide and ArcGIS Online to reproduce the results of the exercise on your own.

Note: ArcGIS Online is a dynamic mapping system. The version that you will be using for this course may be slightly different from the screen shots you see in the course materials.

Time to complete

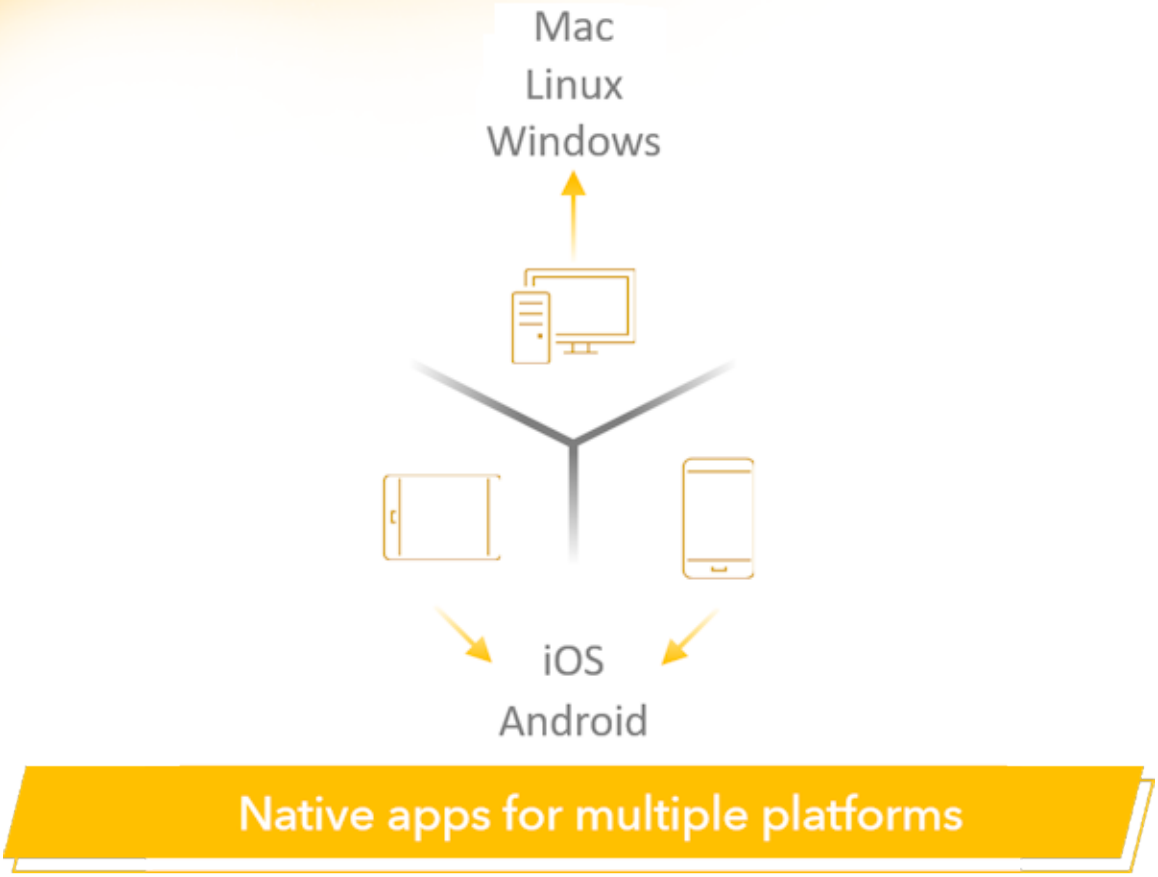
Approximately 50-60 minutes

Technical note

To take advantage of the web-based technologies available in ArcGIS Online, use the latest version of Google Chrome, Mozilla Firefox, Apple Safari, or Microsoft Edge. Other browsers may not display your maps and apps correctly.

Introduction

In Chris's lecture for this section, you learned that native apps are created for a specific platform. Native apps are installed directly onto a device, as opposed to a web app, which is not on a specific device but accessed with a web browser. With ArcGIS AppStudio, you can convert your web maps into beautiful, consumer-friendly mobile apps for Android, iOS, Windows, and more.



You can also publish geo apps to popular app stores using your own brand and without writing a piece of code.

There are two licensing models for building apps with AppStudio: ArcGIS AppStudio and ArcGIS AppStudio Developer Edition. ArcGIS AppStudio is included with the Creator and GIS Professional ArcGIS user types and allows you to build apps from templates. You can then share the apps with your ArcGIS organization using AppStudio Player. AppStudio Developer Edition, available with an ArcGIS Developers Builder Subscription and above, builds on this functionality by allowing you to develop more custom apps, use Cloud Make to build install executables of your app (iOS, Android, Mac, Windows, Linux), and publish to the Apple and Google Play app stores. You can read more about license options (https://bit.ly/2E6KSP2).

Part I - Guided

The exercises in Sections 2 through 6 have two parts: Guided, which provides step-by-step instructions, and Do-It-Yourself, which lets you explore further and build your own geo apps.

In the Guided part of this exercise, you will use AppStudio to build a native app: a mobile field collection app for finding and mapping bike parking areas.

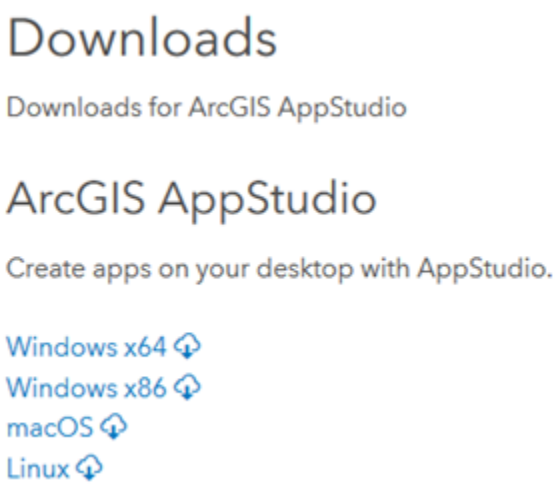
First, you will create a bike parking collection app using the Quick Report template. This template allows users to capture the location of a feature, record information about it, and even attach a photo or video taken with a mobile device. All observations are submitted to an online service, where you can access them through other web or mobile apps. Quick Report apps can also be configured to collect observations in the field in disconnected environments. Then, you will create a map to learn how to show the results of a mobile app.

Step 1: Download AppStudio

To create an app, either from scratch or from a template, and to customize the app, you will install AppStudio on your desktop.

a. Go to the ArcGIS AppStudio resources page (https://bit.ly/39odQWi).

b. Locate and download the appropriate version of ArcGIS AppStudio for your operating system.



ArcGIS AppStudio and ArcGIS AppStudio Player have device and data requirements, and the different user types and roles within ArcGIS organizations have access to different features. For more information, see the system requirements (https://bit.ly/2LU8pV5).

c. Run the file that you downloaded and click Next.

d. Step through the wizard, choosing the default install folder, accepting the licensing agreement, and nominating the Start menu name.

e Click Install.

After the installation is complete, the following shortcuts will be added to your desktop:

- AppStudio
- Qt Creator

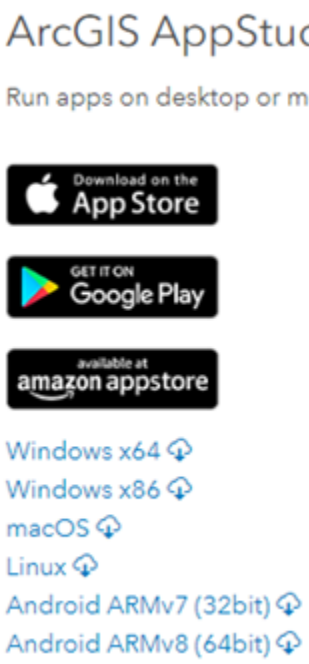
AppStudio is used for configuring and managing your apps. Qt Creator is used for editing apps.

Step 2: Download AppStudio Player

To access your apps on your phone or mobile device without publishing them to the Apple or Google stores, you will download the ArcGIS AppStudio Player app on your device.

Note: The mobile apps that you create in this exercise are meant to be viewed on your mobile device. If you don't have a device to use, you can download AppStudio Player to your computer to view the app.

a Go to the ArcGIS AppStudio resources page (https://bit.ly/39odQWi), or, on your device, open the app store.



b Locate, download, and install the appropriate AppStudio Player app.

With the AppStudio Player on your device, you can view the native apps that you create. You will begin by using the Quick Report app template to create a field collection app.

Step 3: Download assets for this exercise

First, you will create the bike parking collection app using the Quick Report native app template. This bike parking app would be a useful tool for your community to get information about how much bicycle parking exists or is needed. You must download the assets for your app before you begin.

a. In your favorite web browser, go to the Exercise5BikeParking zip file (https://bit.ly/3hmTgse).

b. At the top right of the page, click Download.

c. Save the Exercise5BikeParking file to a location on your computer.

d. Unzip the contents of the Exercise5BikeParking zip file.

Step 4: Publish a feature layer from an existing feature service

Ready to take the next step?

Make sure that you have completed step 1 of *Section 1 Exercise 1: Find Amenities in Denver, CO*. You'll need to use your provided course ArcGIS credentials to complete all of the exercises in this course.

A Quick Report app requires a feature service from a point feature layer. The feature service is used to show submitted observations.

Every hosted feature layer you publish in ArcGIS Online has an underlying feature service, which is a type of web service. Feature layers store the configuration of a particular data source and determine how data is drawn in a web map or app. Every feature layer's service has a Service URL, which can be accessed from its item page:

This URL is a REST endpoint. A REST endpoint is a URL that is provided as a way for web apps to access data through a feature service or any other web service. REST is a common way for web developers to access and share data or services. You can paste a REST URL into a web browser and see the services directory page with more details.

You will use the REST endpoint of an existing public-facing feature service to publish a new hosted feature layer for your app to use. When you create a hosted feature layer in your ArcGIS Online account, as you will do in this exercise, a new, empty feature service is published behind the scenes, allowing you to collect your own set of data.

a. Open a new private or incognito web browser tab or window.

We recommend that you open a private or incognito browser window whenever you need to work in ArcGIS Online to help prevent conflicts with your accounts.

b. Go to www.arcgis.com and sign in to ArcGIS Online using your course credentials.

Note: Step 1 of the Section 1 Exercise 1 PDF explains how to determine your ArcGIS credentials (user name and password) for this course. If you have trouble signing in, please go to the Help tab in the MOOC platform.

c. At the top, click Content.

d. On the Content tab, click Create and choose Feature Layer.

e. In the Create A Feature Layer dialog box, click the From URL tab.

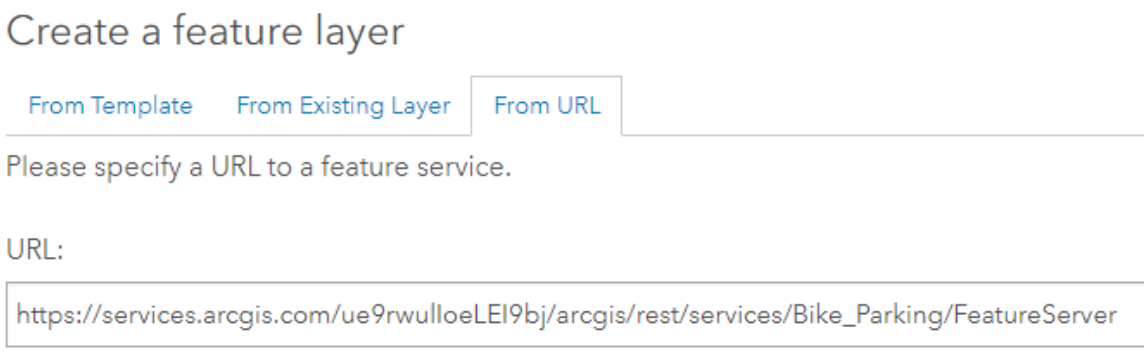
f. For URL, click the following link: https://services.arcgis.com/ue9rwulIoeLEI9bj/arcgis/rest/services/Bike_Parking/FeatureServer (https://bit.ly/2WOToZA)

g. In the new browser window that opens, copy the full URL.

h. Return to the ArcGIS Online browser window.

i. In the Create A Feature Layer dialog box, press Ctrl+V to paste the full URL into the URL field.

Note: If you are unable to click the URL, in a new browser tab, type the bit.ly link and press Enter. Then, copy the full URL and paste it into the Create a Feature Layer dialog box. If you are unable to use bit.ly links, type the full address into the Create A Feature Layer dialog box.



j. Click Next three times to accept the URL, layer, and map extent defaults.

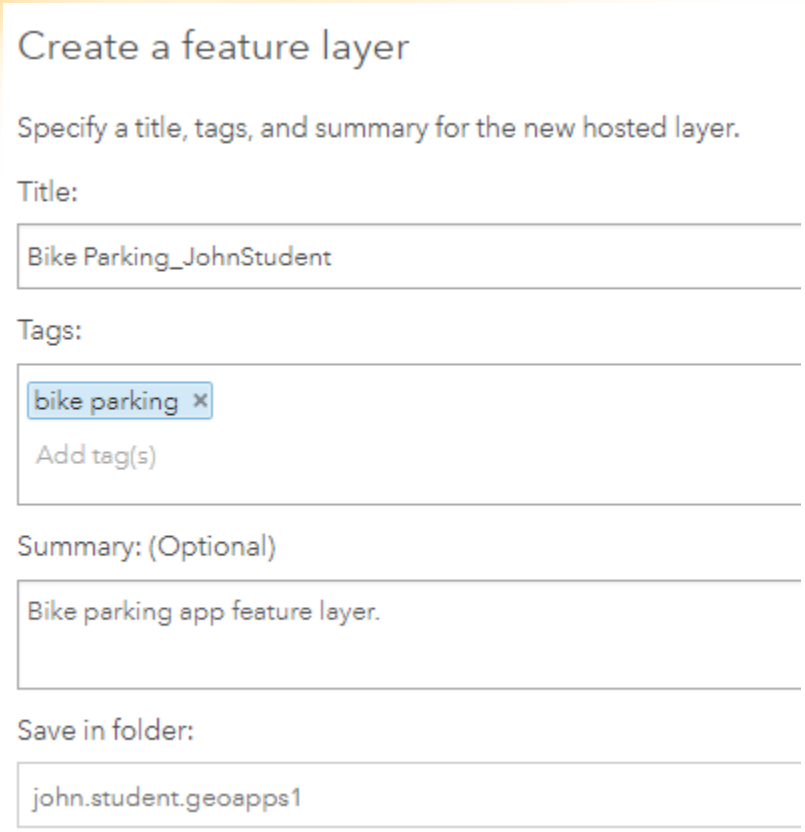
k. On the metadata page, type the following information to specify the details for the feature layer:

- For Title, type **Bike Parking_**, and add your first and last names.

Note: Because many other students are creating a similar feature layer, adding your first and last names ensures that your layer name is unique.

- For Tags, type **bike parking** and press Tab.
- For Summary, verify that it reads **Bike parking app feature layer**.
- For Save In Folder, verify that your main student folder is selected.

The completed dialog box should look similar to the following image.



l. Click Done.

Note: Another way to create an empty hosted feature layer for your app is to build one. From your Content page, you can create items, including feature layers. See this link (https://bit.ly/2L1vn8U) for more information. For this exercise, you are copying an existing feature layer, which already has all of the necessary attribute fields.

The attribute fields of the service are used in the final app when you create and save a feature.

After the hosted feature layer is created, its item page displays.

Step 5: Review and update feature layer settings

Now that you have created a feature layer, you will prepare it for use in your collection app. You will make sure that your layer supports attachments, is shared with everyone, and is editable.

a. Under Layers, click Bike Parking.

Individual layers in a feature layer have their own details pages. On this page, you can enable attachments, which allows users to attach images and other files to individual features in a hosted feature layer. This function is useful because it lets users of your app associate attachments, such as photos, to specific features.

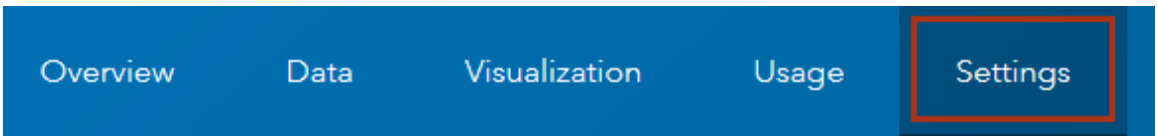
b. In the Attachments section, confirm that the Enable Attachments option is enabled, as shown below.

Users can capture and add attachments of their field observations (such as photos) with this setting.

c. At the top left, click the name of your Bike Parking feature layer to return to the item page.

Feature layers have settings that you can modify to best administer your data. You will verify that the editing settings have been set to allow users to edit features in the app without signing into ArcGIS Online.

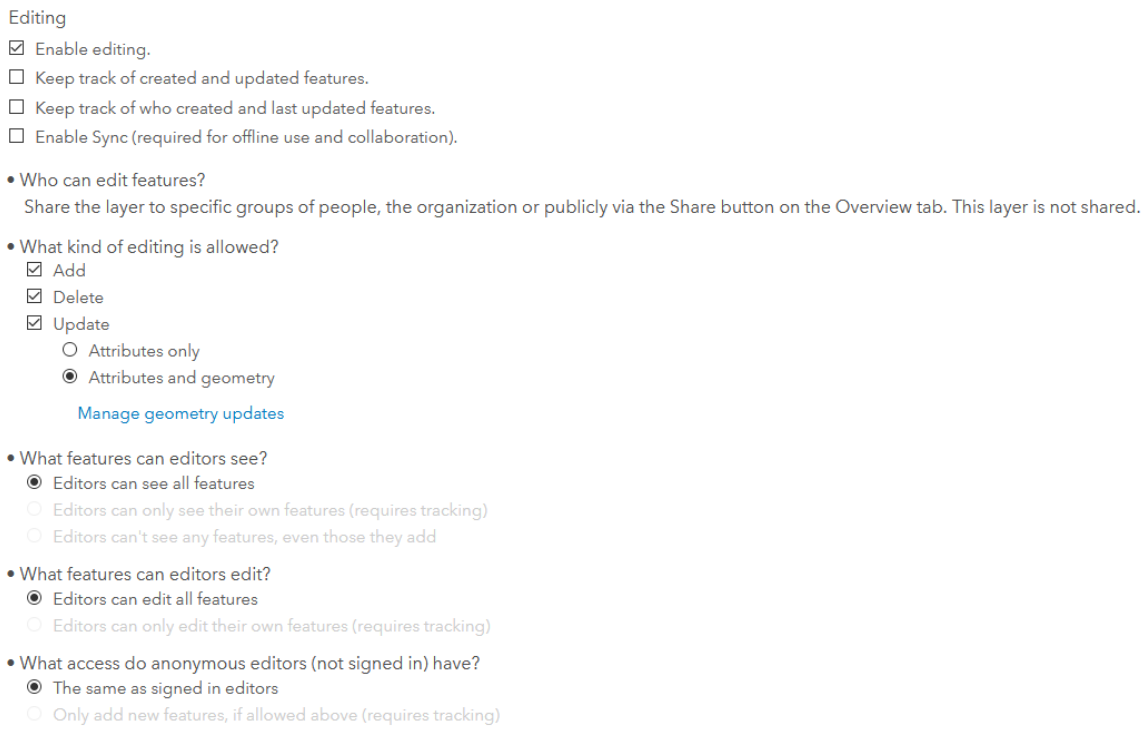
d. On the item page, at the top right, click the Settings tab.



e. Under Public Data Collection, check the box.

f. Scroll down to the Feature Layer (Hosted) section and verify that the editing settings are configured as follows:

- For Editing, verify that Enable Editing is checked.
- For What Kind Of Editing Is Allowed, verify that Add, Delete, and Update are all selected.
- For What Features Can Editors See, verify that Editors Can See All Features is selected.
- For What Features Can Editors Edit, verify that Editors Can Edit All Features is selected.
- For What Access Do Anonymous Editors (Not Signed In) Have, verify that The Same As Signed In Editors is selected.



g. Scroll back up to the General section and click Save.

h. On the item page, click Overview.

i. On the right side of the page, click Share.

j. In the Share dialog box, choose the Everyone (Public) option, and then click Save.

Note: A warning message appears, informing you that the layer you are sharing is editable.

Under the ArcGIS AppStudio license, only public feature services can be used to create native apps, so you must share the service with everyone.

k. Click Update.

l. At the top left, click Edit Thumbnail.

m. In the Create Thumbnail window, click Browse.

n. Browse to the Exercise5BikeParking folder that you unzipped, select the bike_thumbnail.png file, and click Open.

o. Click OK to upload the thumbnail graphic.

Providing a relevant thumbnail for your ArcGIS Online item helps you and others sort through content quickly.

Step 6: Create an app using the Quick Report template

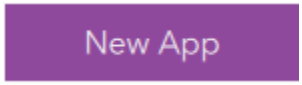
Your service is now ready to be incorporated into a native bike parking app. You will create the app directly from AppStudio, without the usual step of adding the feature layer to a map first.

a. From your desktop, launch AppStudio.

b. At the top right, click Sign In, choose Sign In, and enter your course account credentials.

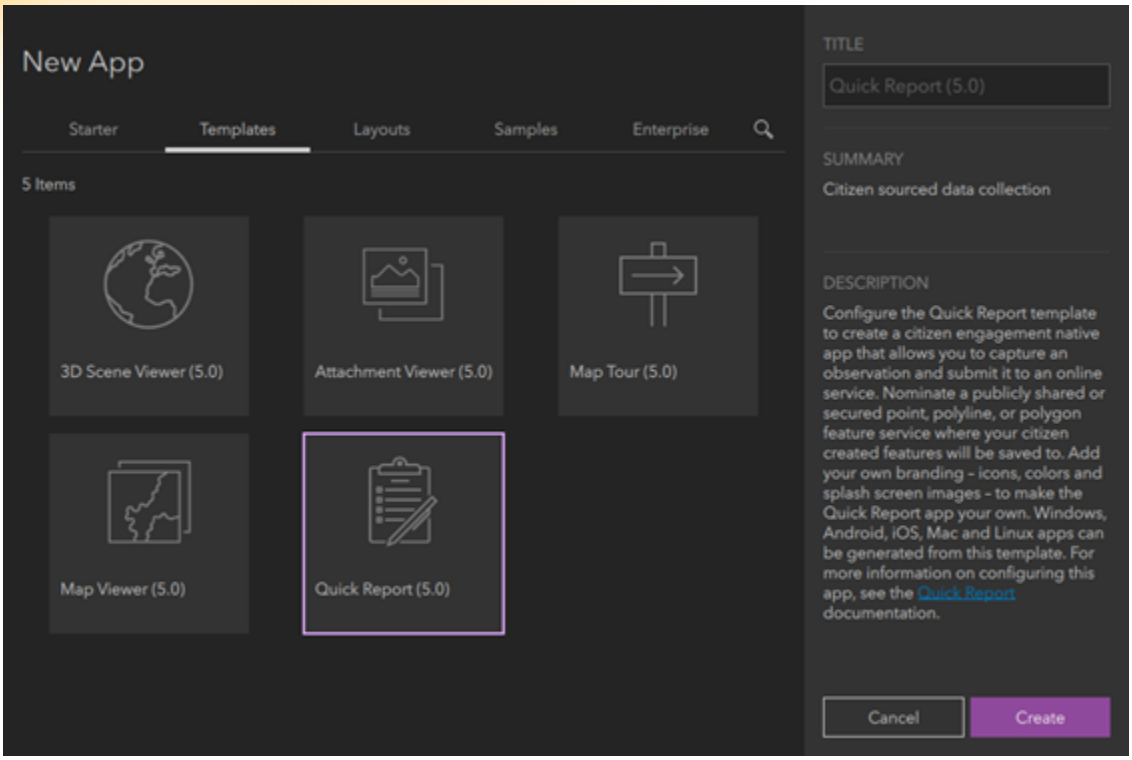
Hint: These are the same course credentials you used to sign in to ArcGIS Online.

c. Click New App.



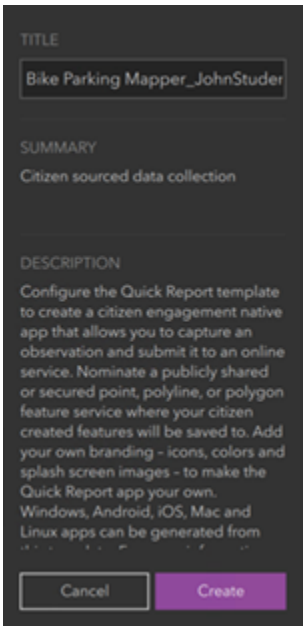
d. Under New App, click the Templates tab.

e. From the available templates, click Quick Report.



The Quick Report template allows users to capture and submit observations to an online service. In this case, the service is your bike parking feature layer.

f At the top right, change the title of the app to **Bike Parking Mapper_<your name>** .



g Click Create.

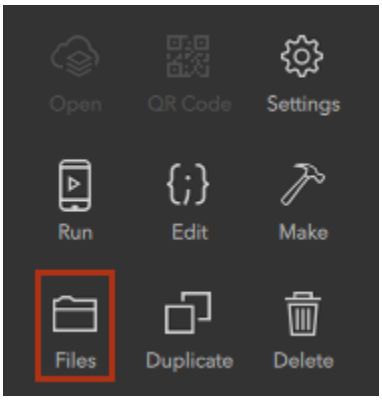
Your new Bike Parking Mapper app is added to the list of apps that you can access. Now you will configure the app's settings.

Step 7: Configure app settings

You will configure your app's settings, including what the app will look like.

a Ensure that your newly created app is highlighted.

b In the side panel on the right, click Files.



Files is where you store the assets, such as photos, that you need for a project. This file structure is created for each new application you create in AppStudio. You will move the photos from the Exercise5BikeParking folder you unzipped earlier to the Assets folder for your AppStudio project.

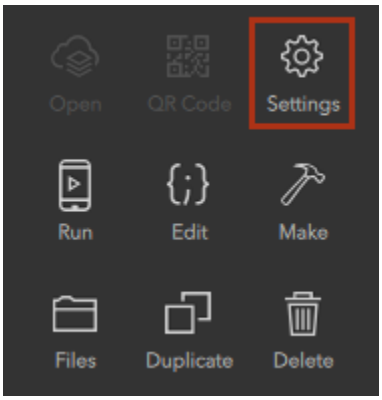
c Double-click the Assets folder to open it.

d In a separate File Explorer window, browse to the contents of your Exercise5BikeParking folder.

e Copy and paste the three image (PNG) files in the Exercise5BikeParking folder into the Assets folder.

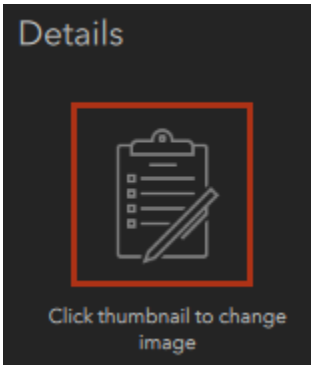
f Close both File Explorer windows.

g In the AppStudio side panel, click Settings.



The Settings dialog box opens to the Details pane by default. This tab is where you will populate the basic descriptive information about your app.

h In the Details pane, click the clipboard icon to change the thumbnail image associated with your app.



i Browse to and open the Assets folder.

j Select the bike_thumbnail.png file and click Open.

You are notified that a copy of this image will replace your current thumbnail.png (the default thumbnail).

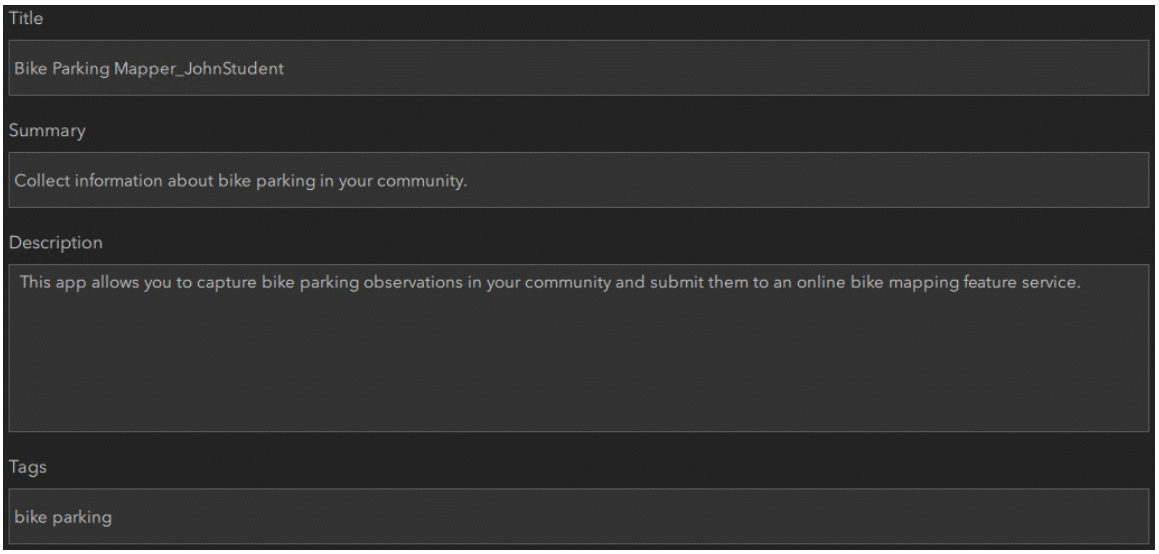
k Click Yes.

The thumbnail icon will now display in ArcGIS Online and on your mobile device in AppStudio Player before opening the app.

The Title field for your app is already populated with the name you provided earlier, Bike Parking Mapper_<your name>. You will update additional details about your app.

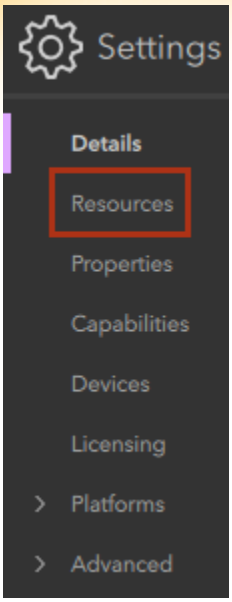
l. On the Details tab, type the following information to replace the default information in the fields:

- Summary: **Collect information about bike parking in your community.**
- Description: **This app allows you to capture bike parking observations in your community and submit them to an online bike mapping feature service.**
- Tags: **bike parking**



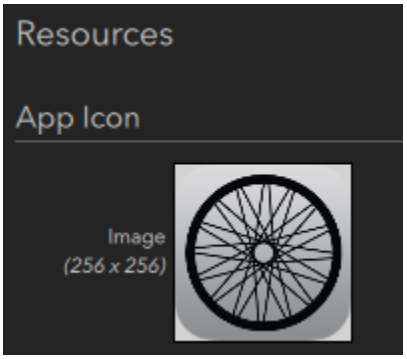
m. Click Apply, but do not close the Settings dialog box.

n. In the Settings dialog box, on the left, click the Resources tab.



o. Under App Icon, click the Image icon and browse to the Assets folder.

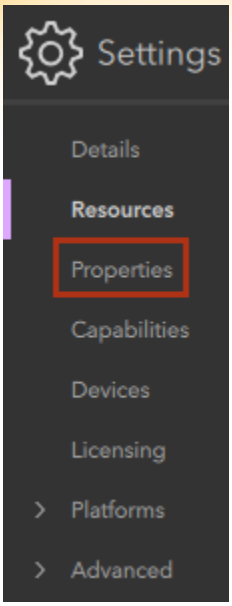
p. Select the bike_icon.png file and click Open.



The app icon will be displayed when you open your app.

q. Click Apply, but do not close the Settings dialog box.

r. In the Settings dialog box, click the Properties tab.



Under QuickReport Properties, the Start Screen tab is open by default.

s To populate the background image that displays on the start screen after the app opens, click the folder icon and add the bike_background.png file.

t Scroll down to the Logo section and change the logo by adding the bike_icon.png file.

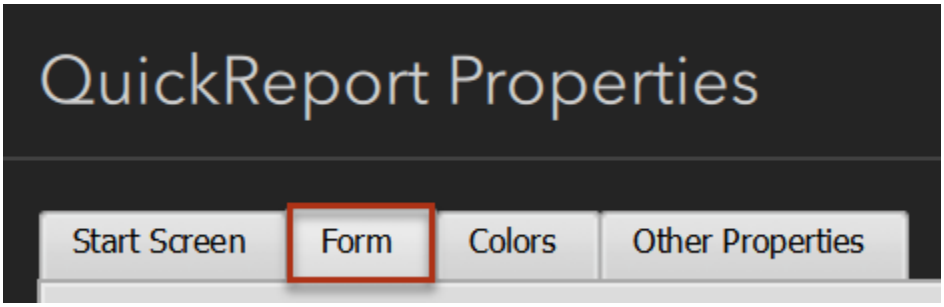
The Logo will display on top of the background image on the start screen when the app launches.

u. At the bottom of the pane, click Apply.

Step 8: Incorporate a feature service into an app

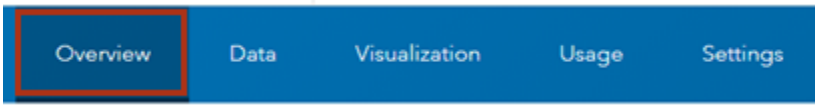
Now you will add the feature service that you created earlier so that users can capture and submit observations about bike parking facilities in their communities.

a. At the top of the QuickReport Properties screen, click the Form tab.

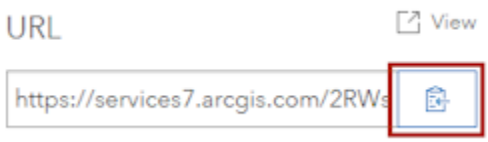


b. Leave AppStudio and the Settings dialog box open.

c. Go to the browser tab where you have ArcGIS Online open, and verify that the Overview tab of the hosted feature layer's item page is open.



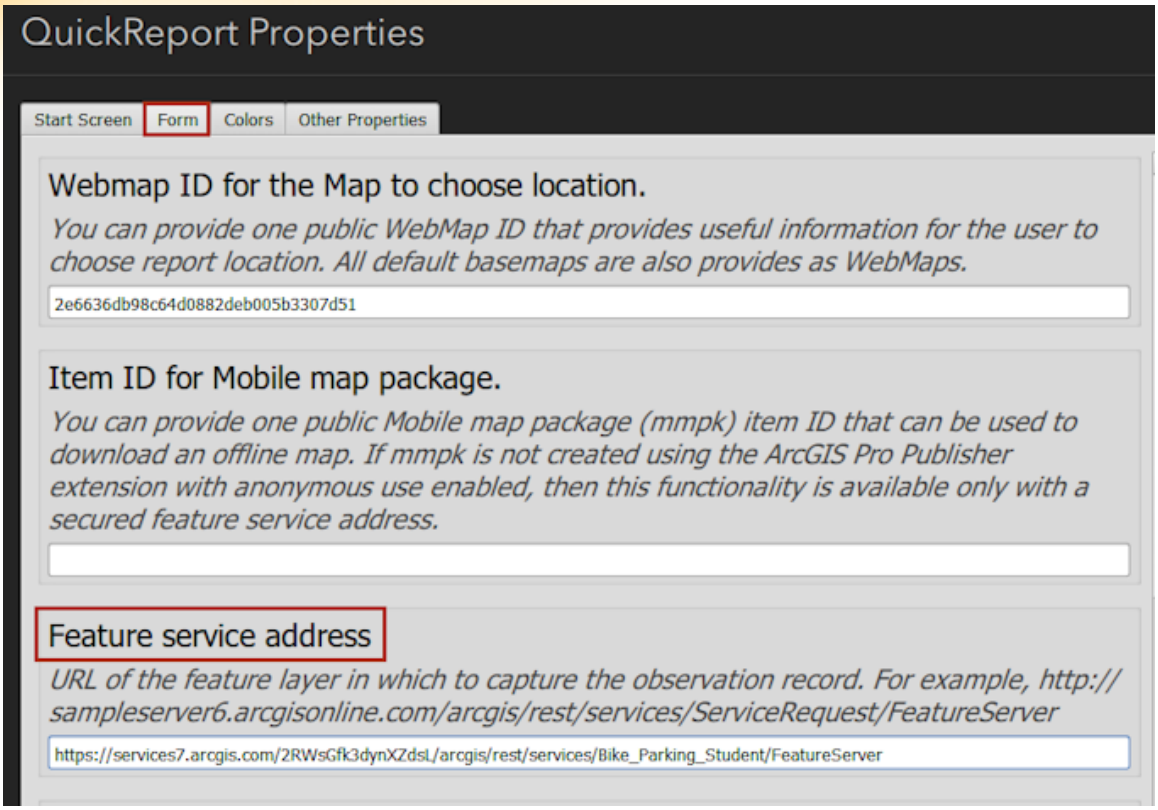
d. Scroll to the bottom of the page and click the Copy button to copy the feature service URL.



e. Return to the Form tab of the AppStudio Settings dialog box.

f. In the Feature Service Address field, highlight and delete the sample URL (https://sampleserver6.arcgisonline.com/arcgis/rest/services/Wildfire/FeatureServer).

g. Paste the URL for your feature layer.



h. At the bottom of the pane, click Apply.

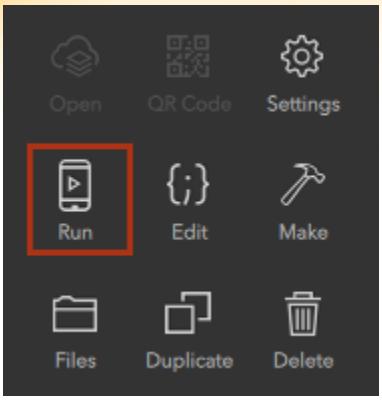
i. Close the Settings dialog box.

The app is now ready to run and record bike parking observations.

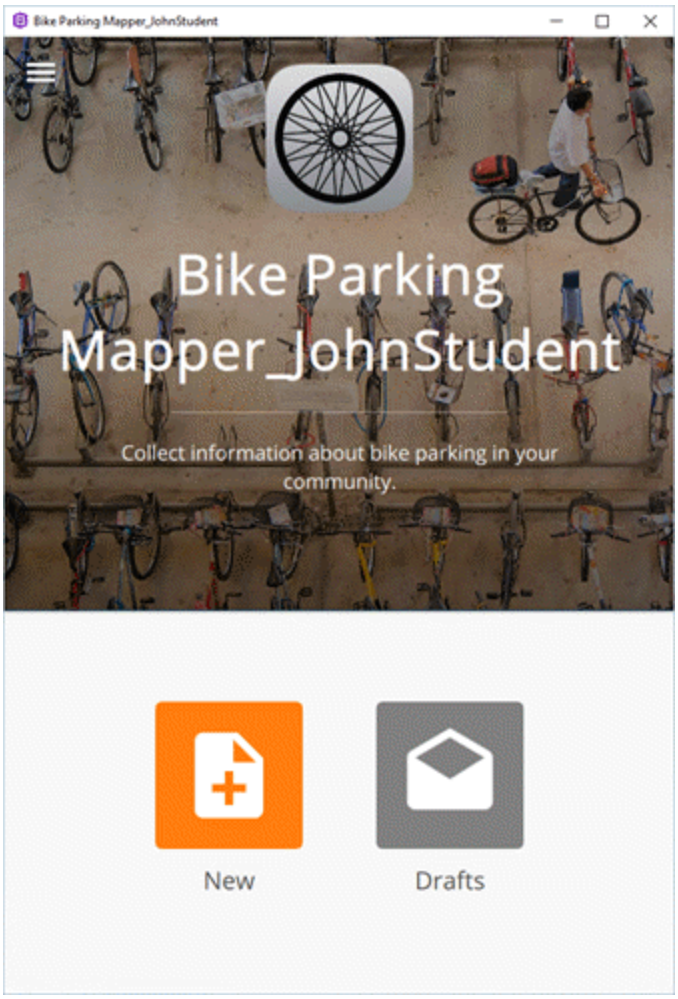
Step 9: View the app using ArcGIS AppStudio

In this step, you will try out your app using the Run tool.

a. In the AppStudio side panel, click Run to open and view your app.



The Run tool allows you to scrutinize your app to ensure that it is configured the way you want.



You can test your app by recording an observation. If you are not near any bike parking facilities, it's fine to record an imaginary feature.

b. Click New to create a new report.

c. If you see a disclaimer message, click Agree.

d. Choose the Bike Parking report.

e. Click the type of report you want to add, and then click Next.

f. Move the map to set the location of the bike parking you are adding, and then click Next.

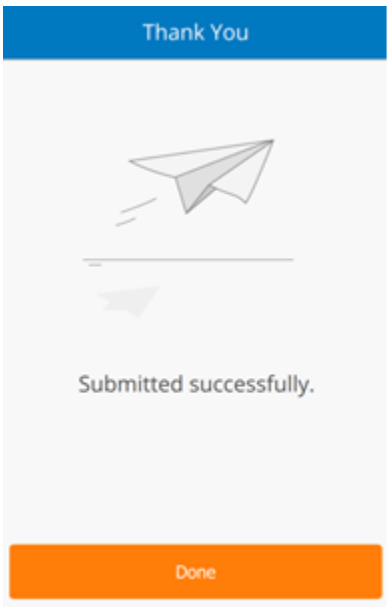
Optionally, you can add a photo or audio file to show the bike parking feature associated with your observation.

g. To add an image, either click Camera to take a new photo or click Album to use an existing photo, and then click Next.

If you prefer not to add a photo, you can click Next.

h. Complete the details form, and then click Submit.

If your feature was added successfully, you will see a confirmation message.



i. Click Done.

j After viewing the app and exploring the configurations, close the Bike Parking Mapper preview.

Congratulations! You just created and used an app to collect observations of bike parking facilities in your community. Although this app is similar to the crowdsourcing app you created in Section 3, the bike parking app is a native app, not a web app. Now you will upload the app from your desktop to ArcGIS Online.

k On the AppStudio side panel, click Upload.

l In the Upload dialog box that opens, keep Sharing Options set to Not Shared (Private) and click Upload.

Your app is now added to ArcGIS Online. Although you are not publishing your app in this exercise, the app must be stored in ArcGIS Online to share it with others or build installation files.

m After the app uploads successfully, close the AppStudio Upload dialog box.

Step 10: Explore options for creating installation files

Now that your app is configured, you have the option to sign and distribute your app using various platforms. You will not sign or deploy your app for this course, but it is useful to explore the steps for signing and publishing your app to an app store.

Note: Read the following information for reference only. You are not required to do anything in this step until you are instructed to close AppStudio.

Before generating the installation files that allow your app to be published to the app store of your choice, you need to perform the following tasks:

- Add your Esri client ID to your app in Settings
- Associate your certification files with your app by signing your app
- Upload your app to ArcGIS Online

Sign your app

Apps that are distributed for others to use must be signed. Signing your app (https://bit.ly/2kMgkc9) is a process that confirms that you, the app creator, are trusted by the app's distributor—Apple (https://apple.co/19ele5e) or Google (https://bit.ly/2MRbKSG) in most cases. You can build your app for Android and load it onto your device without signing it, but you cannot publish the app to the Google Play store. Similarly, you can build your app

for Mac OS X, but without signing the app, users with newer operating systems that include Gatekeeper will not be able to open the app on their devices.

Create app installation files

After you add your Esri client ID, associate your certification files, and upload your app, you can create app installation files using cloud Make (https://bit.ly/2kDQV4v) in AppStudio if you have an ArcGIS AppStudio Developer Edition license (https://bit.ly/2lTc4rD). Using the cloud installation option means that ArcGIS will create the installation files for you. There is a local option if you need to generate the installation files yourself.

Any installation files that you build in the future can be found in the My Apps folder of your ArcGIS Online organization.

Although you will not be publishing your app for this exercise, you can view the app on your mobile device.

a. Close AppStudio.

Step 11: View the app using AppStudio Player

Previously you downloaded AppStudio Player onto either your mobile device or your desktop. Now you will use AppStudio Player to view the app you just created.

a. On your device or desktop, open the Player app.

b. Sign in using your course ArcGIS account credentials.

Depending on your operating system, you may need to look for a Cloud icon to find your app under My Apps, or an Options icon to refresh the contents and find your bike parking app.

c. Select the Bike Parking Mapper app.

Bike Parking Mapper

Bike Parking Mapper_JohnStudent

Version: Online

Information

Created:	4 minutes ago
Updated:	4 minutes ago
Size:	5 MB
Sharing:	Owner

Details

Collect information about bike parking in your community.

Description

This app allows you to capture bike parking observations in your community and submit them to an online bike mapping feature service.

Tags

bike parking

Access and use constraints

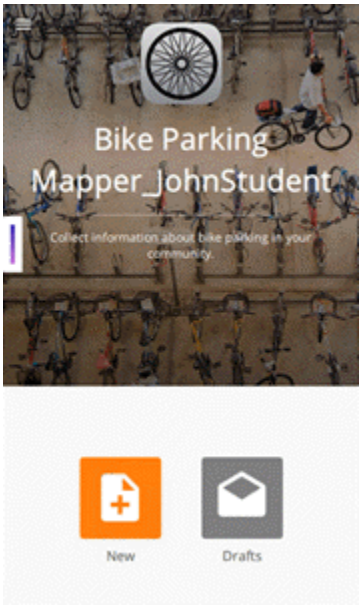
Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item's content. You can edit this in the iteminfo.json or under Terms of use within ArcGIS item page.

Download

d. Tap Download.

e. After the app has downloaded, tap Play, or find the app in the gallery again and tap Open App.

Note: You may need to swipe down first to refresh the apps list.



f. Optionally, add a new bike parking report.

You created a feature when you submitted an observation through ArcGIS AppStudio. You can add additional observations using the AppStudio Player app, which will let you see more results when you add the Bike Parking layer to a web map.

Step 12: View the results in a web map

Recall the workflow graphic describing the process of using a web layer to make a web map, and then using a web map to make a web app.

For this exercise, you have created a collection app to gather data. The web layer was created first and is what the app populates with feature data. You will return to ArcGIS Online, find the populated layer, and use it to create a web map. If you wanted, you could also create an app to display the results.

Note: Whether you submitted a bike parking observation using ArcGIS AppStudio or using AppStudio Player on your mobile device, you will have one or more features in your feature layer to view in the web map.

a. Return to the ArcGIS Online tab in the private or incognito browser.

b. At the top right, click the App Launcher button .

c. From the gallery of apps displayed, click Map Viewer.

d. On the Map Viewer Is Out Of Beta message, click OK.

Next, you will add the Bike Parking layer to the map, so you can see the data you captured with the app your created.

e. Under Layers, click Add Layer.

f. Next to your Bike Parking layer, click the Add button .

g. At the top of the Add Layer pane, click the back button to return to the Layers pane.

You can see the default topographic basemap and your operational Bike Parking layer. The bike symbol was set in the feature service that you copied at the beginning of the exercise.

Note: Bike parking symbology was set in the feature service you copied at the beginning of the exercise. Depending on the type of report you chose to create from the app, you may see a different symbol in the map.

If you completed all steps and added at least one bike parking feature using the native app, you will see the feature on the map. You can return to the native app to add more features at any time and the map will reflect the changes.

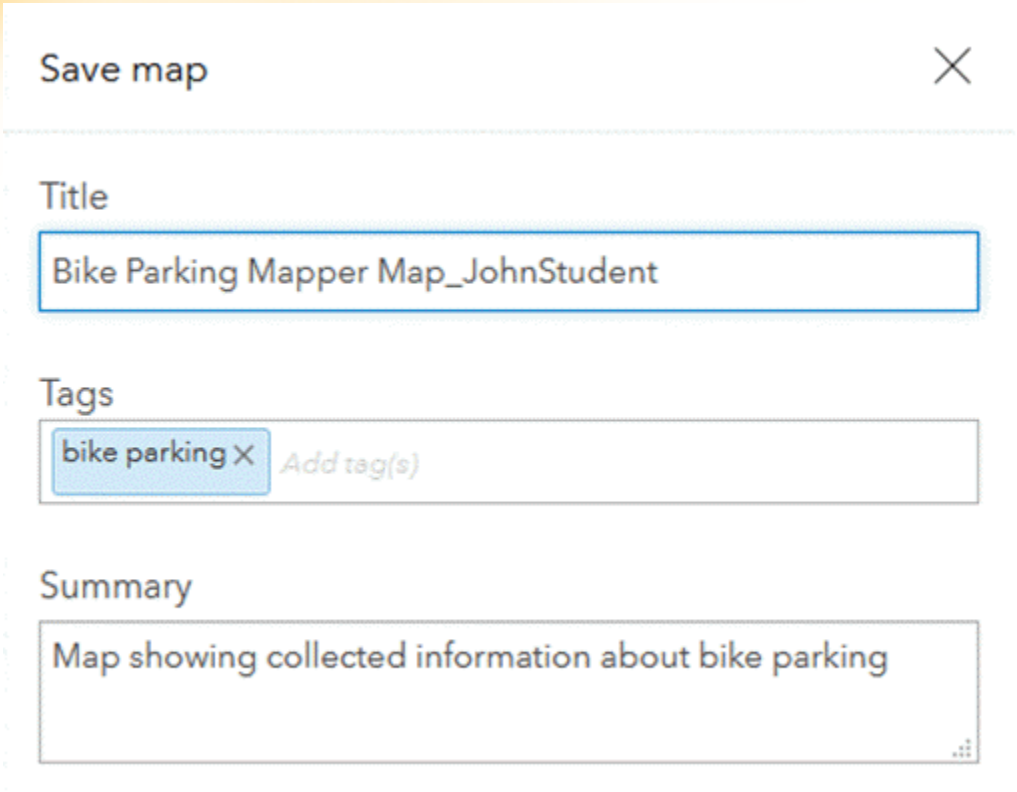
h. Click on a bike parking feature on your map.

In the pop-up window, you can see the fields in the feature layer, which were in the existing feature layer that you copied yours from. You will see the values that you entered in these fields and any attachments that you added.

i. On the Contents toolbar on the left, click Save.

j. Fill out the Save Map dialog box as follows:

- Title: **Bike Parking Mapper Map_<your name>**
- Tags: **bike parking**
- Summary: **Map showing collected information about bike parking**



k. For Save In Folder, leave the default folder.

l. Click Save Map.

The map is now ready to be shared. You can share web maps, but a better practice (especially for sharing outside your organization) is to create and share web apps.

This exercise focused on native apps, so you will not create a second web app to display and share your results.

This concludes the Guided part of the exercise. In the next part, keep going: apply what you have learned and do it yourself!

Part II - Do-It-Yourself

The Do-It-Yourself part presents an optional opportunity for you to apply what you have learned but with less guidance. Build your own geo apps and use your creativity. Resources and samples to help you are listed in the Learning Resources section at the end.

Even if you choose not to complete a Do-It-Yourself project, we ask you that you read through this section so that you can find and learn from your fellow students' work.

Explore the templates further and create your own app

In the Guided part of this exercise, you used the Quick Reports template to create a native app. In this part, you can create a new mobile or other native geo app.

Create a new native app
Open AppStudio, sign in using your course credentials, and click New App.

You used the Quick Report template in the Guided part of this exercise. In the Do-It-Yourself part, you will use a template of your choice. The Map Viewer (https://bit.ly/2EWJGfo) template is a great way to showcase a collection of web maps through a native app. The Attachment Viewer (https://bit.ly/3r7dKdJ) template focuses on media, such as photos and documents, tied to a location. You can also try the Map Tour (https://bit.ly/2Q5GXSR) or 3D Scene Viewer (https://bit.ly/2lwDymJ) templates to create an app on any topic that interests you.

Share your work with the class

After you complete your work for this part of the exercise, please share with the class. If you created an interesting app, the class can review your app and give feedback. If you created a crowdsourcing app, the class can install your app and give you some results to analyze.

Complete the following steps to share your mobile app with the class:

In ArcGIS Online, on your Content page:

1. Find your native app.
2. Open the item page, click Share, and share to Everyone (Public).

In AppStudio:

1. Ensure that your app is highlighted in the list of apps.
2. From the AppStudio gallery side panel, click QR Code.
3. Take a screen shot of the QR code that appears.

In the Forum:

1. Post your Do-It-Yourself app in a forum post for other students to review. Include the QR code screen shot in your post.
    - If you have a device such as an iPad that cannot store screen shot files, share the image to an online source, and then provide the link to the image.
2. Give the post a descriptive title that includes the hashtag **#DIYSection5**.
    - The tag will help everyone find your work and add some results, if it is a crowdsourcing app.

There is no app link or URL to add to the post, just the QR code for viewing the app in the Player app.

Remember, have fun, explore, and experiment—but please do not share maps or apps from the Guided part; only share Do-It-Yourself work.

Finding the work of other students

Now that you have shared your Do-It-Yourself work in the forum, please find and review the work of other students.

1. In the forums, search by the hashtag **#DIYSection5**.
2. Read other student posts and review their mobile apps. If someone created a crowdsourcing app, complete it so that the student gets results to display.

To view other students' mobile apps:

1. Open the Player app on your phone or mobile device.
2. Click the icon at the top left (or top right if you have the older version of the app) and click Scan QR Code.
3. Scan the screen shot of the QR code provided in the forum post.

Then, give any helpful feedback or ask questions by replying to the forum post.

Learning Resources

Good work! In this exercise, you used AppStudio to build a crossplatform native app—without any coding. We look forward to seeing your work from the Do-It-Yourself part of the exercise, where there are great options for creating mobile or other native apps.

Here are some more resources to help you continue learning:
Who says building native apps has to be challenging? (https://bit.ly/2vYNGqP)
Seminar recording: ArcGIS AppStudio: An Introduction (https://bit.ly/2P2fVxJ)
Webinar: Building Cross-Platform Native Apps with AppStudio (https://bit.ly/2OHvZCQ)