

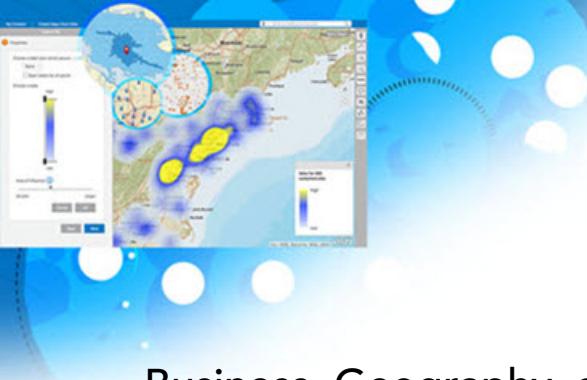
Exercise

Business, Geography, and the Location Advantage

Section 1 Exercise 2

10/2017





The Location Advantage MOOC

Business, Geography, and the Location Advantage

Instructions

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

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

Time to complete

Approximately 45-55 minutes.

Technical note

To take advantage of the web-based technologies available in ArcGIS Online, you need to use a fairly new version of a standard web browser, such as Google Chrome, Firefox, Safari, or Internet Explorer. Older web browsers may not display your maps correctly.

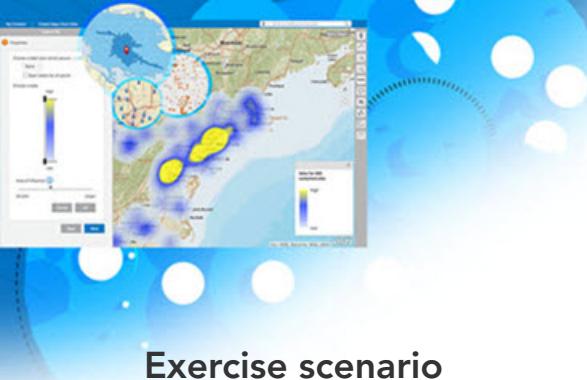
Note: For information on supported browsers for ArcGIS Online, visit <http://doc.arcgis.com/en/arcgis-online/reference/browsers.htm>.

Introduction

In this section's lecture, **you learned about the relevance of geography to business**, and how industries, companies, and departments can leverage location information in decision making to gain an advantage. **Now you will be introduced to some tools and techniques** that are used for analyzing location data in a business scenario.

This exercise presents an approach to using **ArcGIS to identify the locations of bank branches, along with the characteristics of the population in the areas around the branches**. The information will help management decide **how to best promote new bank services** to customers and potential customers in areas near bank branches. For example, people in more densely populated areas might be interested in the security and convenience of online banking, people with more income might be more interested in investments or home loans, and so on.

The purpose of this exercise is to help you gain experience using geospatial software, as part of a GIS, which lets you analyze spatial relationships of objects or areas on the earth. The data, scenario, analysis, and resulting decisions are hypothetical. Also, the exercise is designed to help you gain experience in applying geospatial software to help answer business questions and make informed decisions.



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Exercise scenario

In this scenario, you are an analyst employed with Sixth Consolidated Bank, a fictitious bank chain in Toronto, Canada. Your manager has asked for your assistance in creating a presentation to show the areas where your Toronto bank branches are located, along with some basic demographic characteristics of the areas that describe the people who live there. The presentation is for a meeting your manager will be attending to discuss the promotion of new bank services.

You realize the best way to quickly and easily show this information is visually, so a **story map** would be ideal.

In this exercise, you will use the ArcGIS Online mapping platform to perform these tasks:

- Create a web map
- Work with map layers
- Geocode locations on a map
- Visualize demographic data on a map
- Create a web-based story map

Note: The analysis tools in ArcGIS Online require a subscription. While you are enrolled in this course, you have access to an ArcGIS Online subscription at no cost.

If you would like to continue using ArcGIS Online after the course ends, you will need to purchase a subscription. For more information, visit www.arcgis.com.

Approach

Throughout the exercises in this course, you will use a four-step **question-model-analyze-interpret** workflow for decision making. You can use this approach in any situation, whether it involves location data or any other business information.



Question Model Analyze Interpret



Note: The Resources section in Udemy for this lecture includes a downloadable version of the four-step decision-making workflow with more explanation.

In this exercise, you will analyze the locations of bank branches in relationship to the characteristics of the population located in areas near each branch. As you examine these spatial relationships, or how the location of these things are related, you will see how mapping and visualization can facilitate decision making. In this case, you can use information about the **income characteristics and household sizes** in the areas where bank branches are located to make decisions about which bank services might be promoted in particular areas.

Formulate the Question

Using location information when approaching business decisions can help support and inform your decision-making efforts. For this exercise, bank management needs to make some decisions about where to promote new bank services. A map that shows bank branch locations and demographic characteristics of the population in those areas would be useful for decision-making efforts. Formulating the question, or questions, you must answer in order to make decisions is your first task.

You can frame the primary business question as follows:

Where are bank branches located, and what are the characteristics of the population in those areas?

Model the Solution

The next task is to model the solution, or identify what is needed to answer the business question. This task includes gathering the data, including the locational component that you need, and identifying the techniques you will use to provide the information a business can use to make decisions.

What is the locational component?



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There are several locational components associated with the business question in this exercise. You must identify where the bank branches are located, and a map can be used to show where things are located. You also need to identify the characteristics of the population who lives in the areas where the bank branches are located-determining what is located within an area. This determination involves assessing the types of people who live there, what median income those individuals have, and so on.

What data do I need for my map?

To create a map that shows the locations of Sixth Consolidated Bank branches and the characteristics of the population who lives in the areas where the branches are located, you will need several types of data:

- **Address** information for bank branch locations in Toronto, Canada
- **Demographic** information about the population who lives in areas where the bank branches are located, including median incomes and average family sizes
- A **satellite image** of the city of Toronto as an alternate basemap

Where can I get the data I need?

As you learned in the lecture, location data exists in many forms within an organization. You know that your bank maintains street address information for all of its branches.

Address information is very common in most organizations. This type of location information can be displayed on a map to show relationships that were not visible before, such as how far objects are from one another, how objects are dispersed across a city or other area, and so on. Location information is often stored in spreadsheets, or in an organization's ERP (enterprise resource planning) or CRM (customer relationship management) systems. When searching for location information in these data sources, look for columns or key fields such as **x/y, longitude/latitude, mailing addresses, or postal codes**.

ArcGIS Online includes population characteristics and demographic information for many different countries that you can use, as well as satellite imagery.

Which techniques will I use?

Geospatial techniques are a way of understanding information with a location component. Using geospatial techniques, you can understand, explore, and analyze information with a location component to help inform your business decisions.

For this exercise, you will use a **technique called visualization** to show the locations of bank branches on the map, and another **technique called geocoding** to find geographic locations based on street address information. The term "geocoding" means locating an object on a map using location information, such as a street address, postal code, or longitude and



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latitude coordinates. Because you already have the bank branch addresses, you can use geocoding to map the location of each bank branch. Another **technique you will use is overlay**, which refers to placing map layers on top of each other to gain insight into geospatial relationships.

Perform the Analysis

Recall from the lecture that GIS is a system of tools and techniques that can provide you with information through analysis to help you answer business questions and make decisions. **Spatial analysis is the process of analyzing spatial relationships using a GIS**. For this exercise, you will use spatial analysis to examine, or analyze, the location of bank branches and population characteristics to determine how and where to promote new bank services.

Interpret the Findings

After you perform the analysis and examine the findings, you may discover that you have more questions. You can use the **four-step decision-making workflow as an iterative process** to help you review and interpret information and inform decision making.

Analysis Workflow Using ArcGIS Online

Using ArcGIS Online, you can create a map with the information needed for your analysis.

Step 1: Sign in to an ArcGIS Online organization

In this step, you will sign in to the ArcGIS Online organization for *The Location Advantage* MOOC.

- a Open a new Internet browser tab or window.
- b Go to www.arcgis.com and sign in to ArcGIS Online using the credentials explained at the start of this course.

Note: The Section 1 Exercise 1 PDF explains how to determine your ArcGIS Online credentials (username and password) for this course. If you have trouble signing in, email GISTraining@esri.com for assistance.

Step 2: Create a new map

After you have signed in, you will see the Home page of the organization for *The Location Advantage* MOOC.

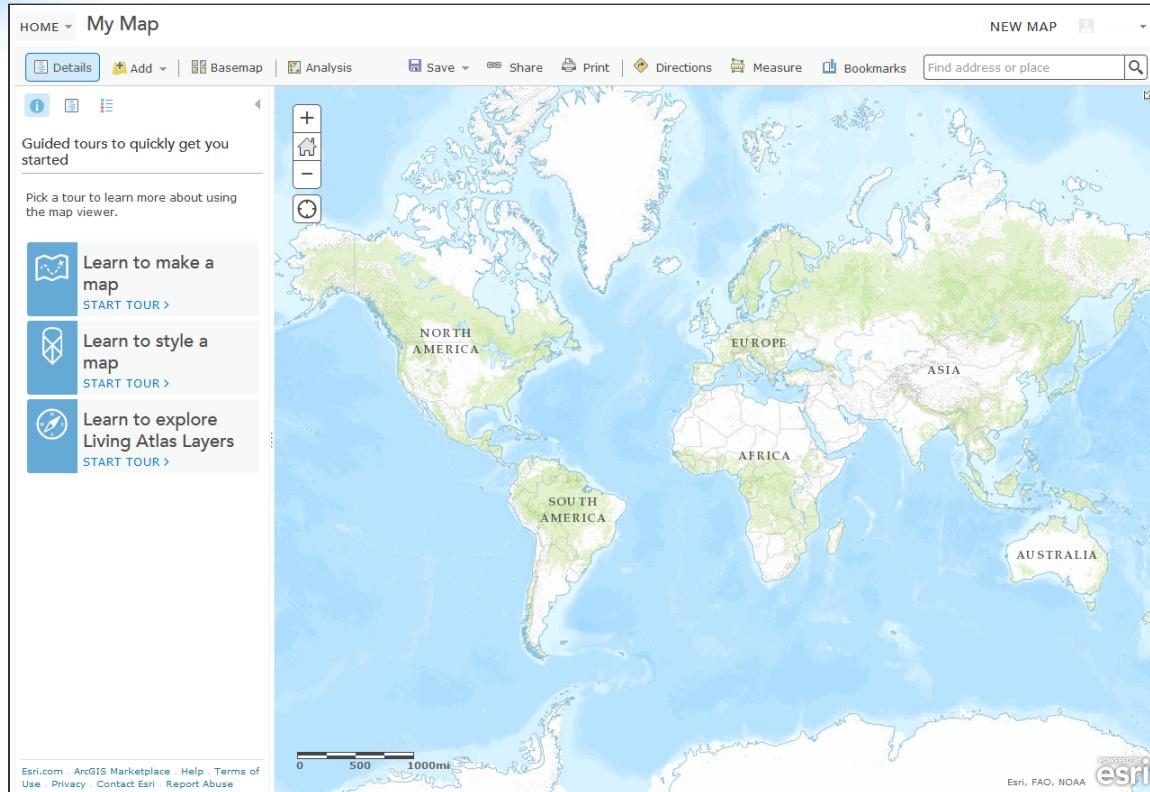
The screenshot shows the ArcGIS Online interface. At the top, there's a dark header bar with the text "The Location Advantage MOOC". Below this is a navigation bar with links: Home, Gallery, Map, Scene, Groups, Content, and Organization. To the right of the navigation bar is a user profile icon for "John" and a search bar. The main content area features a large blue banner with the title "The Location Advantage". Below the banner is a text box containing two paragraphs: "Welcome to *The Location Advantage*. You'll work inside this environment to complete the course exercises." and "If you have questions about using ArcGIS Online or about the exercises, visit the Udemy Q&A." At the bottom of the page, there's a footer with links to Esri.com, ArcGIS Marketplace, Help, Terms of Use, Privacy, Contact Esri, Report Abuse, and Contact Us.

- a From the ribbon at the top of the ArcGIS Online window, click **Map** to start creating a new map.

Notice that a map is displayed, showing the world. This type of map, called a basemap, is a geographic background, in a single map layer. Basemaps typically show basic features of the landscape and place names to help orient the map's users.

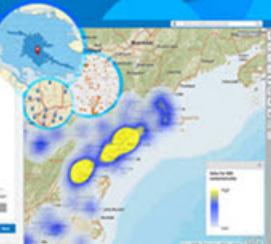


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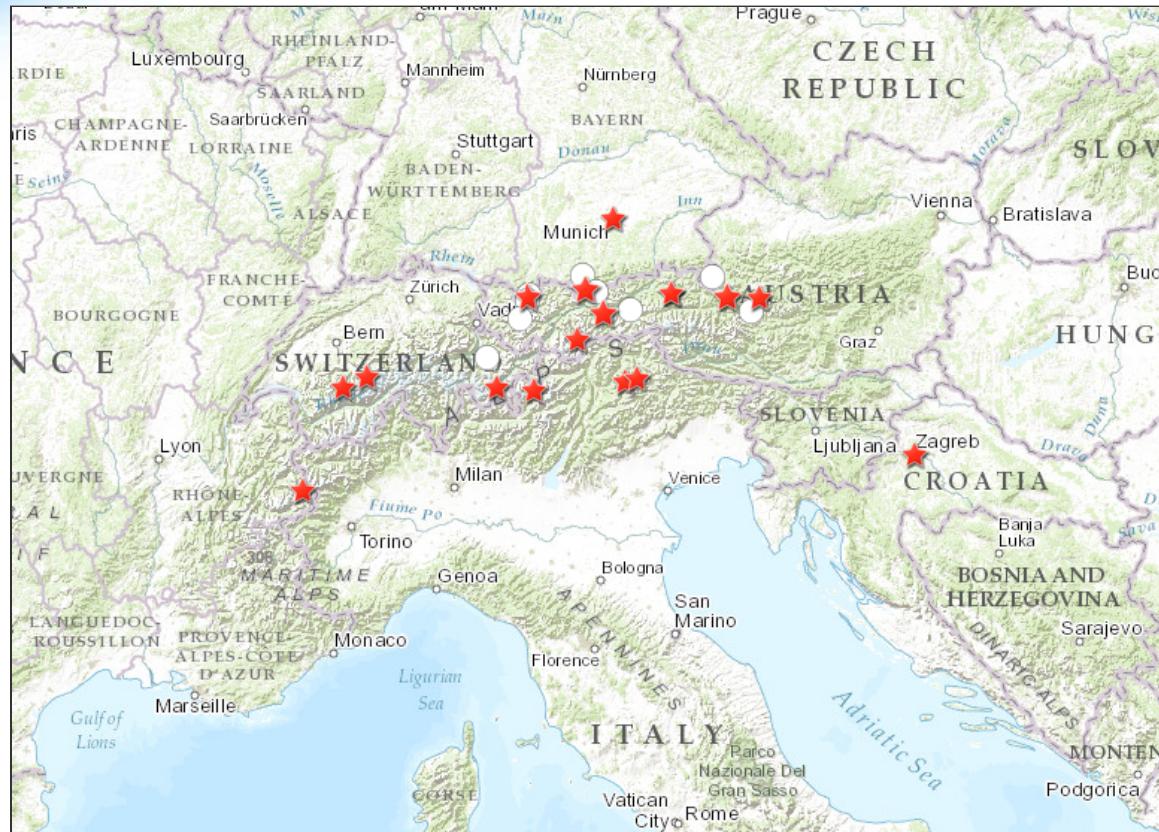


Basemaps can serve an additional purpose. A streets basemap can show a road network, a topographic basemap can show the land, or a light or dark canvas background basemap can mute most of the features to highlight certain thematic layers.

Thematic layers contain the business or other location data that you place on top of a basemap, so that they become the foreground of the map. You can think of thematic layers as laying on top of a basemap.



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In this exercise, the thematic layers contain the location information for the bank branches and the demographic characteristics, such as income and average family size.

Step 3: Download a file containing location information

To create a map of the bank branch locations in Toronto, you need the address or location information for each of the branches. The bank has this information in a spreadsheet. One of your colleagues has taken the street address information from the spreadsheet and saved it as a comma-separated values (.csv) file.

Note: If you are working on a device that does not have download capabilities, skip to the Unable to Download section at the end.

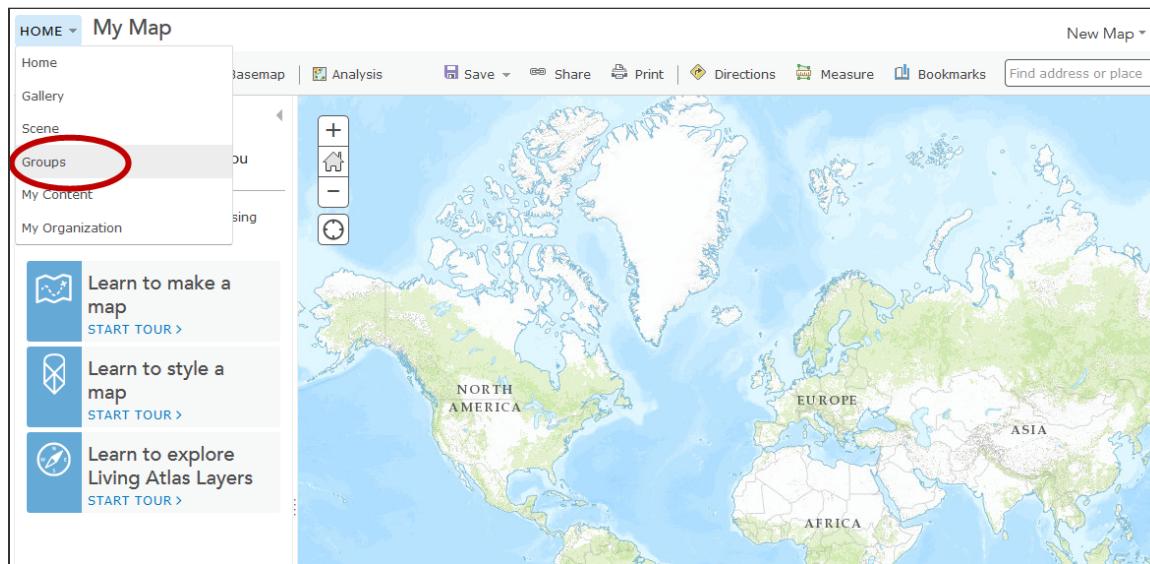


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	A	B	C	D	E
1	Address	City	Province	PostalCode	Headquarters
2	410 Summerhill Avenue	Toronto	ON	M4W2E4	No
3	1293 Saint Clair Avenue West	Toronto	ON	M6E 1C2	No
4	4436 Sheppard Avenue East	Toronto	ON	M1S 1V2	No
5	182 Front Street East	Toronto	ON	M5A 4N3	No
6	150 College Street	Toronto	ON	M5T 1S1	No
7	2202 Martin Grove Road	Toronto	ON	M9V 5H9	No
8	63 Hanna Avenue	Toronto	ON	M6K 3N7	No
9	6172 Bathurst Street	Willowdale	ON	M2R 2A2	No
10	2282 Bloor Street West	Toronto	ON	M6S 1N9	No
11	779 Bay St	Toronto	ON	M5G 2C8	No
12	1500 Avenue Road	North York	ON	M5M 3X2	No
13	66 Wellington Street West	Toronto	ON	M5K 1A1	Yes

This .csv file contains location information, such as street address and postal code. You can use this information to map the bank branches using geocoding. First, you will download the file so you can geocode the branches and publish them as a map layer.

- At the top of the page, click Home, and from the drop-down list, choose Groups.



- You are a member of the group named Section 1. Click the group name to see the items that have been shared with this group.
- On the Section1_Toronto Banks Data item, place your mouse pointer over the layer thumbnail image.

Section 1

Overview Content Members



Data and results for Location Advantage MOOC Section 1 case study exercise

owned by alee.locadv

Description

Data and results for Location Advantage MOOC Section 1 case study exercise

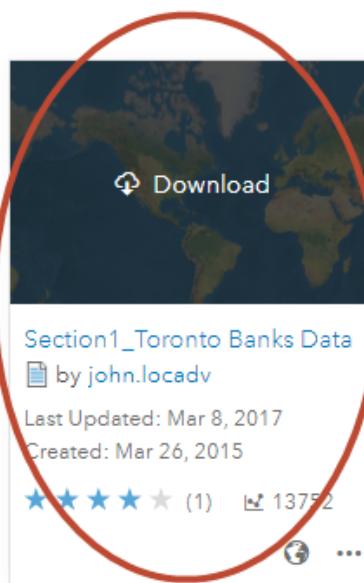
Latest Content



Section1_Step 3 Results
by john.locadv

Last Updated: Apr 14, 2017
Created: Mar 20, 2015

★★★★★ (1) 11997



Download

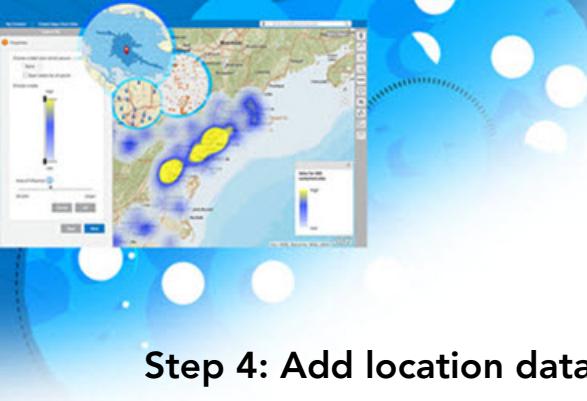
Section1_Toronto Banks Data
by john.locadv

Last Updated: Mar 8, 2017
Created: Mar 26, 2015

★★★★★ (1) 13752

- d Click Download.
- e Save the file to a location of your choice, such as on your computer's desktop.
- f At the top of the page, click Map to return to your map.

Note: If you are unable to download because you are working on a device that does not have download capabilities, refer to the "Unable to download" section at the end of this document.



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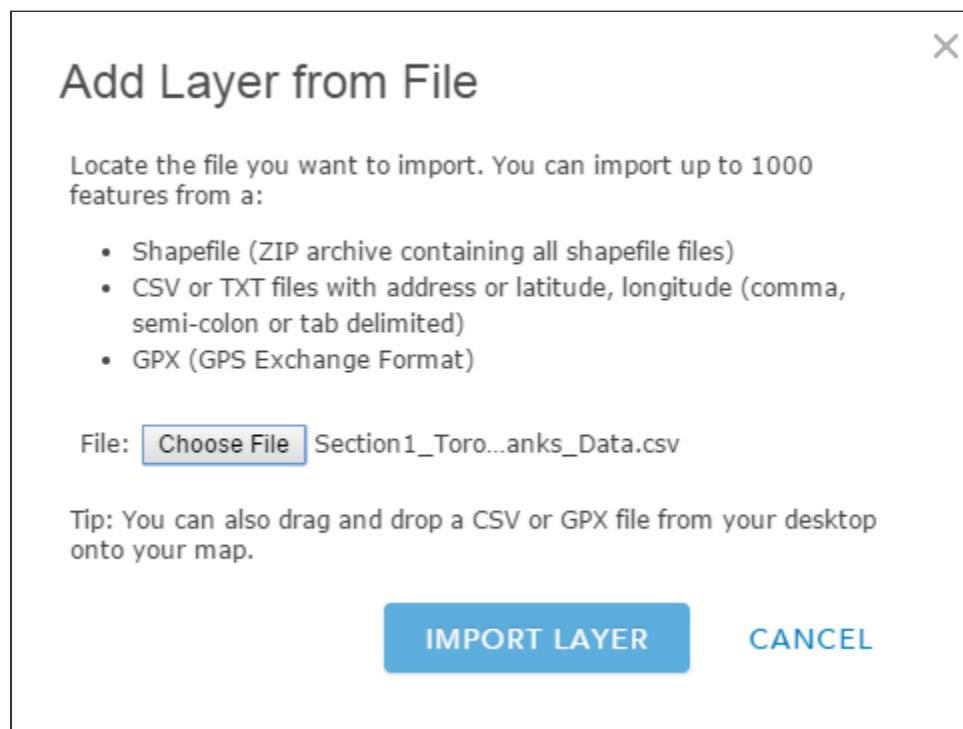
Step 4: Add location data to the map

Next, you will add location information from the .csv file to the map.

Note: If you are working on a device that does not have download capabilities, skip this step.

- a Click Add, and then choose **Add Layer From File**.
- b In the pop-up window, click Choose File, locate the file you just downloaded to your computer, and click Open.

Note: In some browsers, the *Choose File* button may be labeled *Browse* instead.



- c Click **Import Layer**.

The Add CSV Layer dialog box that pops up is what you use to perform geocoding. ArcGIS Online recognizes the location fields in your file and will try to use them to show the records on a map. It uses different geocoding services, which are web services that are customized by country to look for the address fields that each country uses. For example, the United States uses City, State, and ZIP Code, while Canada uses City, Province, and Postal Code. Any record that has valid data in the fields that match the geocode fields will be placed on your map.

- d In the Add CSV Layer dialog box, leave **Locate Features By** set to Addresses Or Places.



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- e For In, choose Canada from the drop-down list.
- f Verify that the Address, City, Province, and PostalCode fields from the .csv file appear in the Field Name column on the left and match up with the Location Fields from the Canada geocode service in the right column.
- g Click Add Layer.

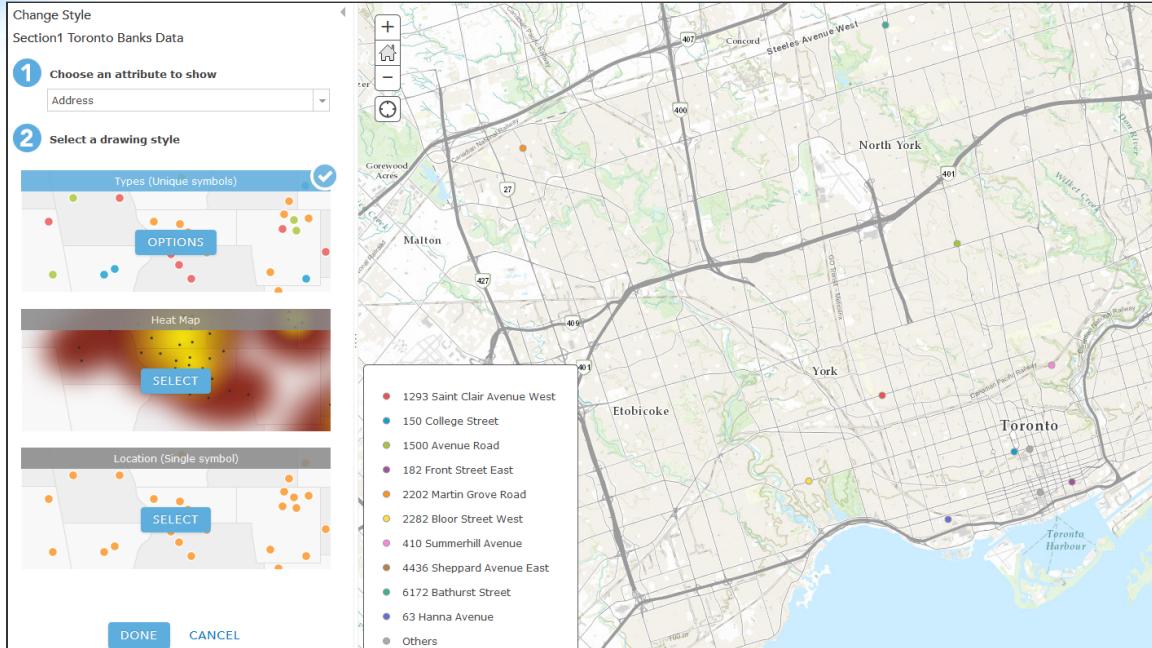
The map display updates to show the Toronto, Canada metropolitan area, with the locations of the bank branches indicated by small colored point symbols, which represent point features. Other feature types include line features, like streets or rivers, and polygon features that show area, such as a state, country, street parcel, or lake.

Feature type	Examples	Looks like
Point	Buildings, lightning strikes	• • •
Line	Streets, rivers	— — —
Polygon	Countries, lakes	■ ■ ■

With this bank branches layer, ArcGIS Online defaults to styling the points with small colored circle symbols. It starts with the Change Style pane open in case you want to change the symbol style.

The map legend preview box shows the locations based on postal code. To show bank branch addresses, you can change the value displayed in the legend.

- h In the Choose An Attribute to Show field, in the drop-down list, choose Address.



- i Click Done.

Step 5: Save the map

Before making additional changes to your map, you will save it.

- From the ribbon at the top of the ArcGIS Online window, click Save and choose **Save As**.
- In the Save Map dialog box, in the Title field, type **SixthConsolidated**. Add an underscore and your first and last names so the map has a unique name.

Note: Because there are many other students creating a similar map, adding your first and last name will ensure that you can later find your map.

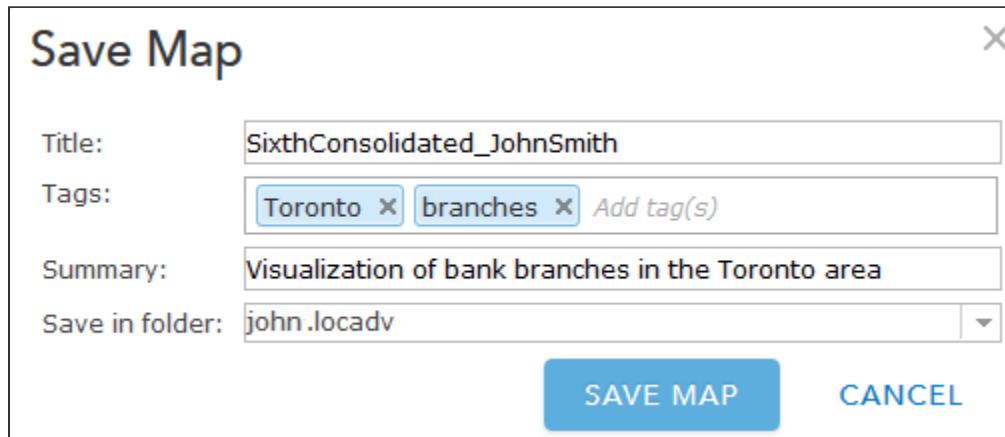
It is also a good idea to add tags and other identifying information about the data, called metadata, to your items. This information will help you and others find this map, either in your organization or the general public, depending on how you want it shared. Tags also help group different types of items together, such as maps, map layers, or applications, so they can easily be searched.

- In the Tags field, type **Toronto, branches**, and any additional tags you would like.

Note: Press Enter after each tag to save it in the Tags field.



- d If you like, you can add a summary description of your map in the next field. For example, type **Visualization of bank branches in the Toronto area** in the Summary field.



- e Click Save Map.

Note: ArcGIS Online is a web-based platform, but just like any other software application, it is recommended you periodically save your map as you are working.

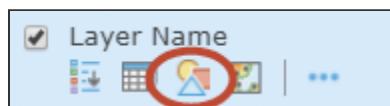
The map will be saved to your **My Content collection**, which contains all the content you have created in ArcGIS Online. You can access your My Content collection at any time.

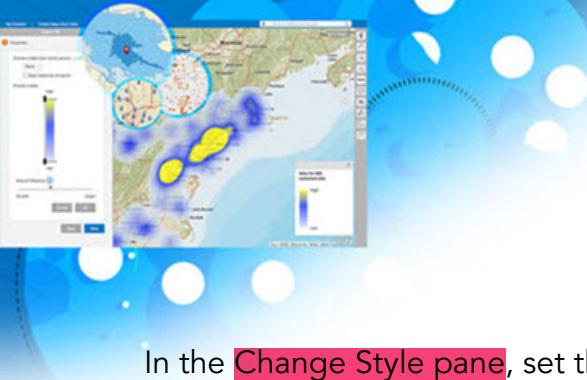
Step 6: Change the map style

Esri's Smart Mapping for ArcGIS Online capability establishes more informed **default settings** so that maps display data most optimally based on the type of data that you add. However, you can always change the styles that it sets.

Because many people will view the presentation that you will be making, you decide that the symbol used for the branches should be changed so that the bank branch locations can be more easily seen over different basemaps or with other thematic layers. In this step, you will change the map style to **give the bank branches better, more visible symbols**.

- a To open the Change Style pane for the layer, in the Contents pane, hover your pointer over the layer and click the Change Style button.

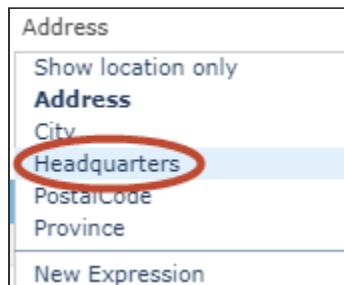




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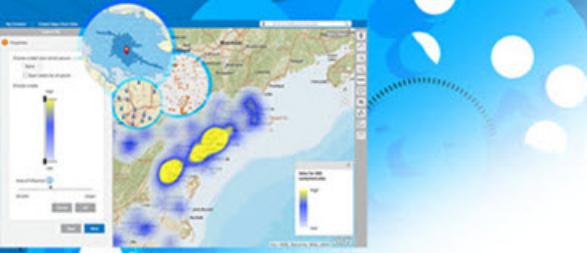
In the **Change Style pane**, set the following parameters:

- From the Choose An Attribute To Show drop-down list, choose **Headquarters**.

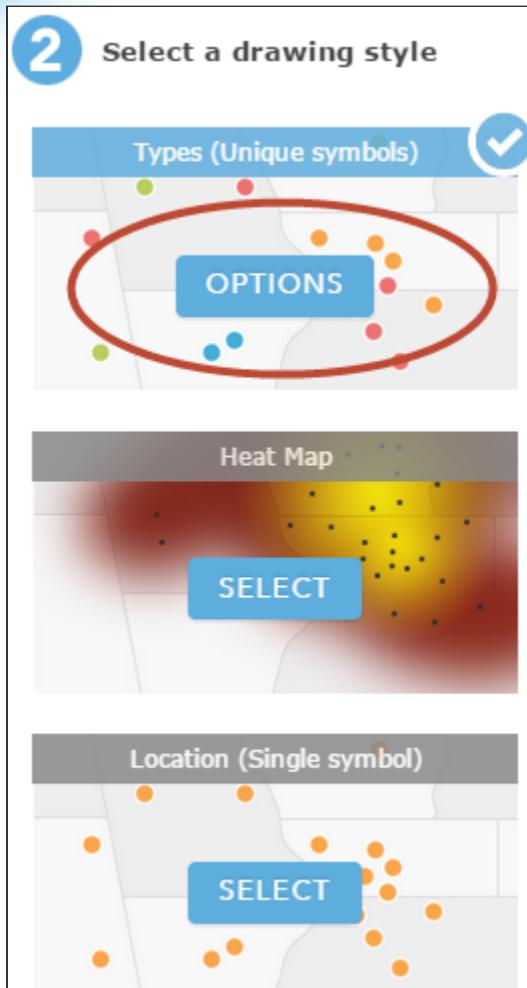


You will use a unique symbol to distinguish the headquarters from other bank branches.

- Click **Options** to customize the look of the layer.



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This setting allows you to symbolize the points by the Headquarters attribute, the column in the data that denotes whether a point is a branch location or the site of the company headquarters. You should now see values of this field listed at the top of the Change Style pane.



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Change Style

Section1 Toronto Banks Data

Headquarters

Click to edit symbol or label.

LABEL	COUNT	
No	11	
Yes	1	
Other	0	

- In the Label column, click the Yes value to highlight it, and in the Label field, delete Yes, type **Headquarters** and press Enter.
- Click the symbol to the left of the Headquarters text to open the symbol selection dialog box.
- At the top, click Shape, and scroll down through the different available symbols, clicking through the drop-down options to see the different categories.

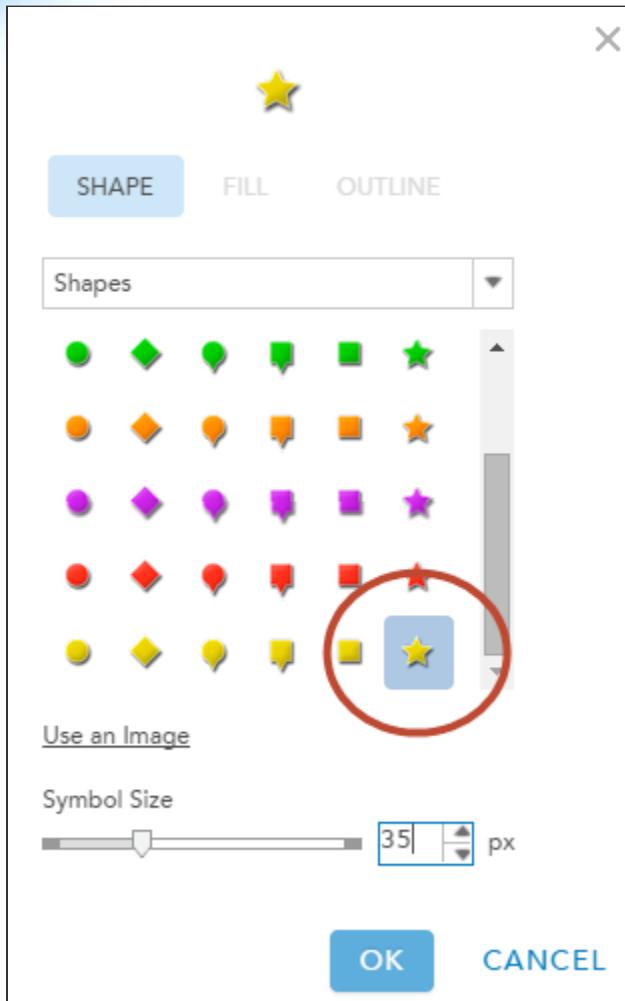
You can see there are many different symbols for point layers, such as your bank locations.

- In the drop-down list, choose Shapes, and scroll down to find a **yellow star symbol**.

You will use the yellow star symbol to indicate the bank branch headquarters location.

- Below the symbols, increase the size of the symbol to **35 pixels**. You can use the Symbol Size slider by moving it to the right, or you can use the text box to the right of the slider.

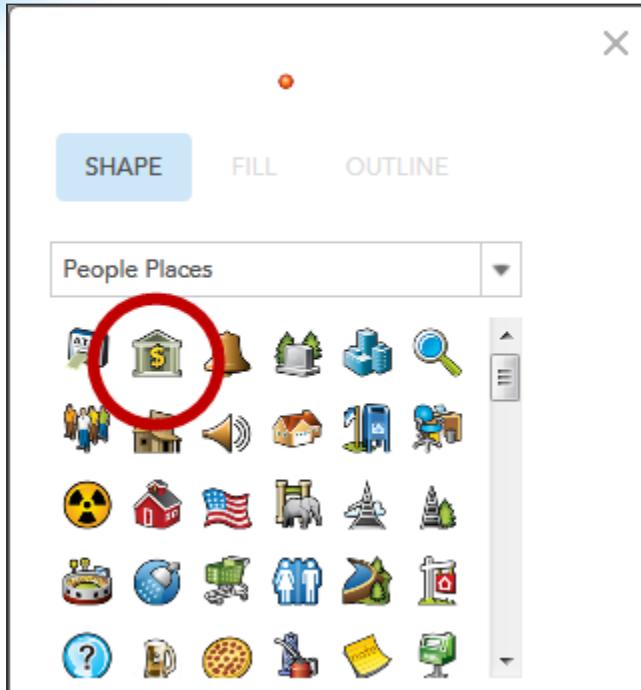
Note: The symbol at the top of the dialog box will increase or decrease in size as you move the slider to give you an idea of the size of the symbol when placed on the map.



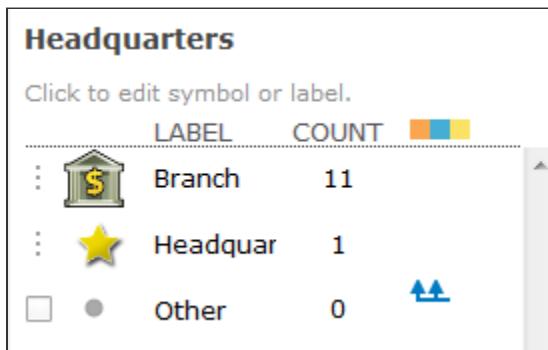
- Click OK to close the symbol selection dialog box.
- Next, in the Label column, click the No value to highlight it, and rename the Label field as **Branch**.

Now, choose a symbol to better represent bank branch locations.

- Click the point symbol to the left of the Branch text to bring up the symbol selection dialog box again.
- From the drop-down list, choose **People Places**, and choose the second symbol, which represents a bank.

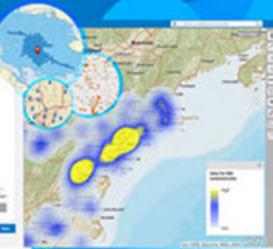


- Increase the symbol size to 20 pixels.
- Click OK to close the symbol selection dialog box.

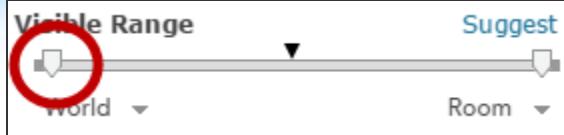


Note: The Other value in the Label field represents those bank locations that are neither branches nor headquarters. In this case, the COUNT field for Other has a value of 0, meaning all of the banks are identified as either a branch or headquarters.

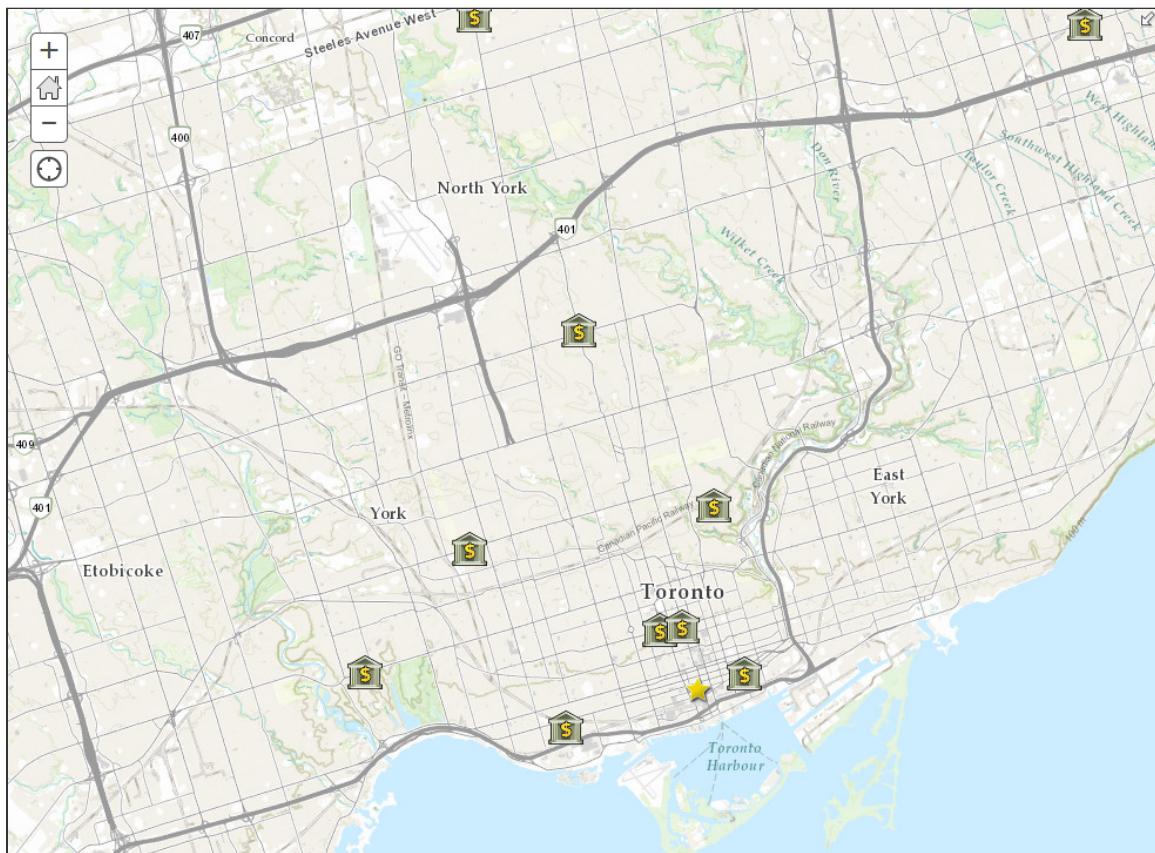
- At the bottom of the left pane, click and drag the slider for Visible Range all the way to the left so that the layer will be visible on your map even if you zoom out.



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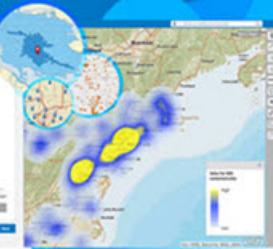


- b Click OK, and then click Done.

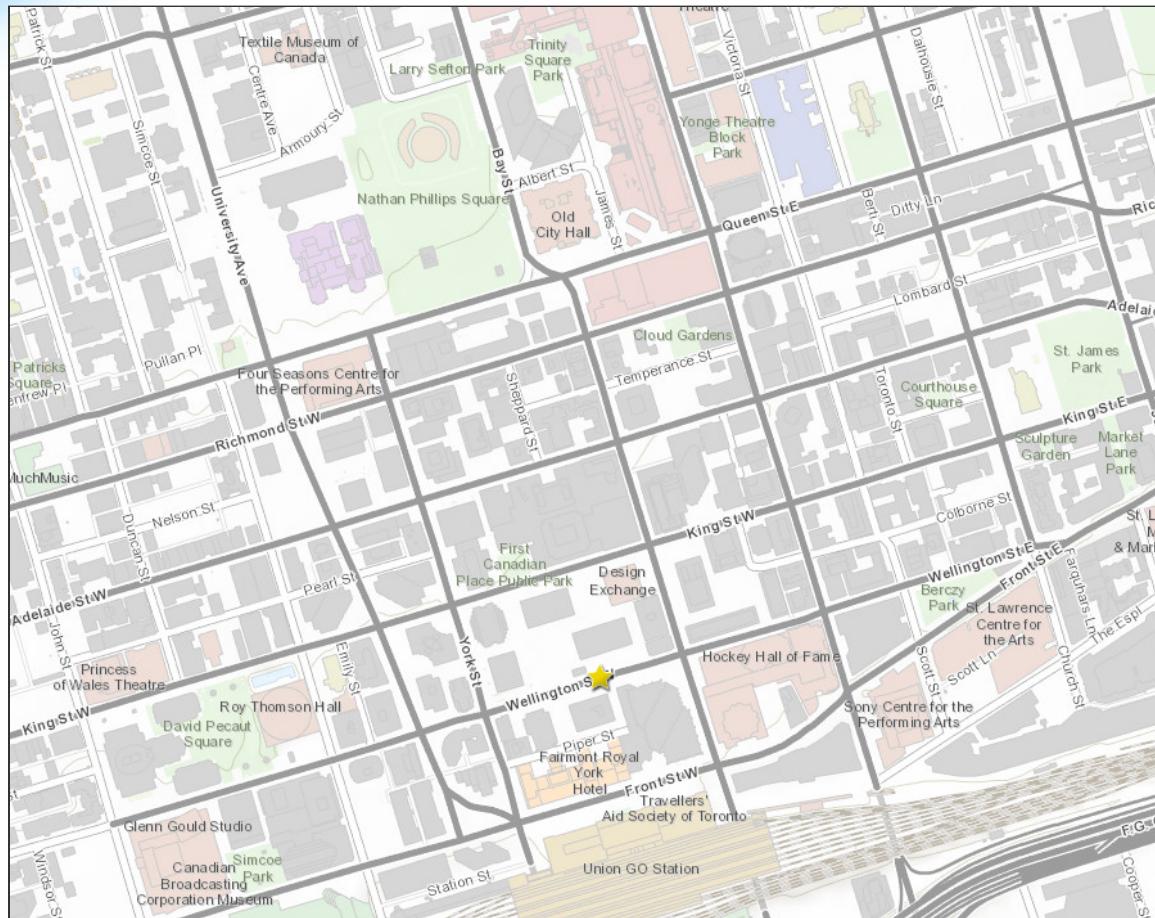


Previously, the map showed a much larger area of the world. How close in or far out the map is zoomed is similar to map scale on a traditional map. The viewing scale has changed, and the map now appears zoomed in to the area of Canada that includes the city of Toronto.

When you zoom in on a map, objects in the map look larger, but you can see less of the world. A **large map scale** example would be a map that shows a neighborhood- or city-level view.



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Large-scale maps show greater detail because you are zoomed in closer to the objects on the map. When you zoom out, objects look smaller and you see less detail, but you can see more of the world. A **small-scale map** could show states and provinces or even countries.

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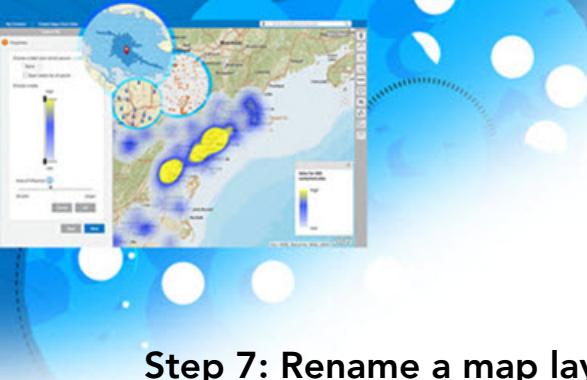


Take a moment to **explore the map** at different scales.

- c) Navigate the map using the Zoom In, Zoom Out, and Default Extent buttons in the upper-left area of the map.

Button name	Icon
Zoom In	[+]
Default Extent	[House icon]
Zoom Out	[-]

- d) Pan, or move, the map by clicking and dragging the map up, down, left, or right.
- e) Zoom in or out so that all Toronto bank branches are visible.



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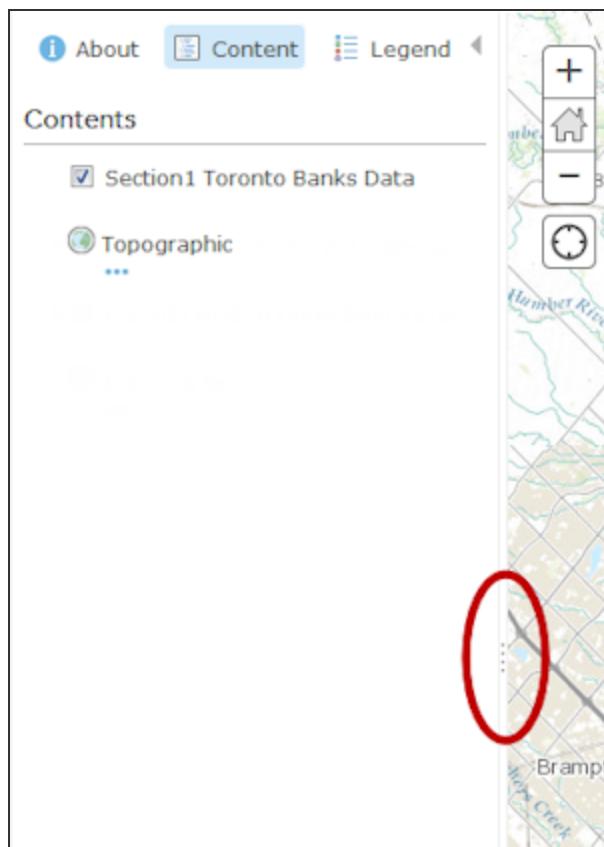
Step 7: Rename a map layer

Each ArcGIS Online map has a list of one or more map layers on the left side of the map in the **Contents pane**, tools at the top (with layer-specific tools accessible from the Contents pane), and a map frame that displays the map layers.

The **three buttons at the top of the Details pane** provide options to see information about the map, the map contents, and a legend.



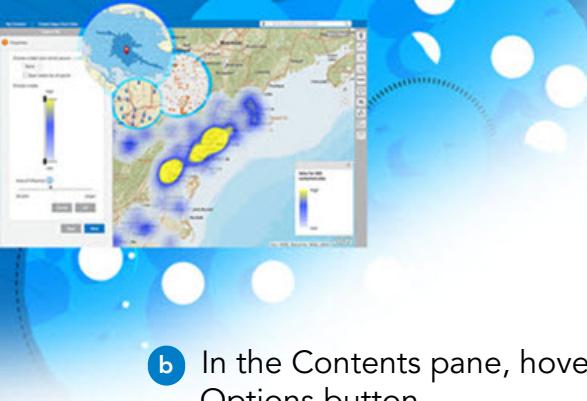
Note: Depending upon the width of the Details pane, the **button labels may be visible or hidden**. You can click and drag the horizontal size handle icon in the middle of the right edge of the Details pane to resize the Details pane and map frame.



- a If necessary, click the Content button to display a list of the layers in the map.

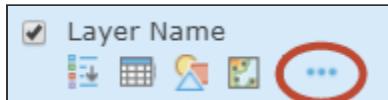
Your map content shows the bank branch locations layer and a basemap layer.

Next, you will **rename the bank branches layer**.



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- b In the Contents pane, hover your mouse pointer over the banks layer and click the More Options button.



- c From the drop-down list, choose Rename.
d Change the layer name to **Toronto Branches**.
e Click OK to close the dialog box.

Next, you will **add another thematic layer** to show population characteristics.

Step 8: Examine a thematic map layer

In this step, you will add a thematic layer showing median household income. Layers like this and many more are available in ArcGIS Online, from your own content, your organization, or anyone who has shared their content with the public—millions of available layers and maps.

- a From the ribbon at the top of the ArcGIS Online window, click Add.
b From the drop-down list, choose **Search For Layers**.
c In the Find field, type **Canada median income**.
d For In, choose **ArcGIS Online** from the drop-down list.
e Fill the check box next to Within Map Area, and click Go.

Note: The *Within Map Area* check box allows your search to return any layers that **overlap** the current map extent. In this case, check the box in order to filter the median income layers to only those including this extent.

You will add the **2016 Canada Median Household Income** layer, authored by Esri.

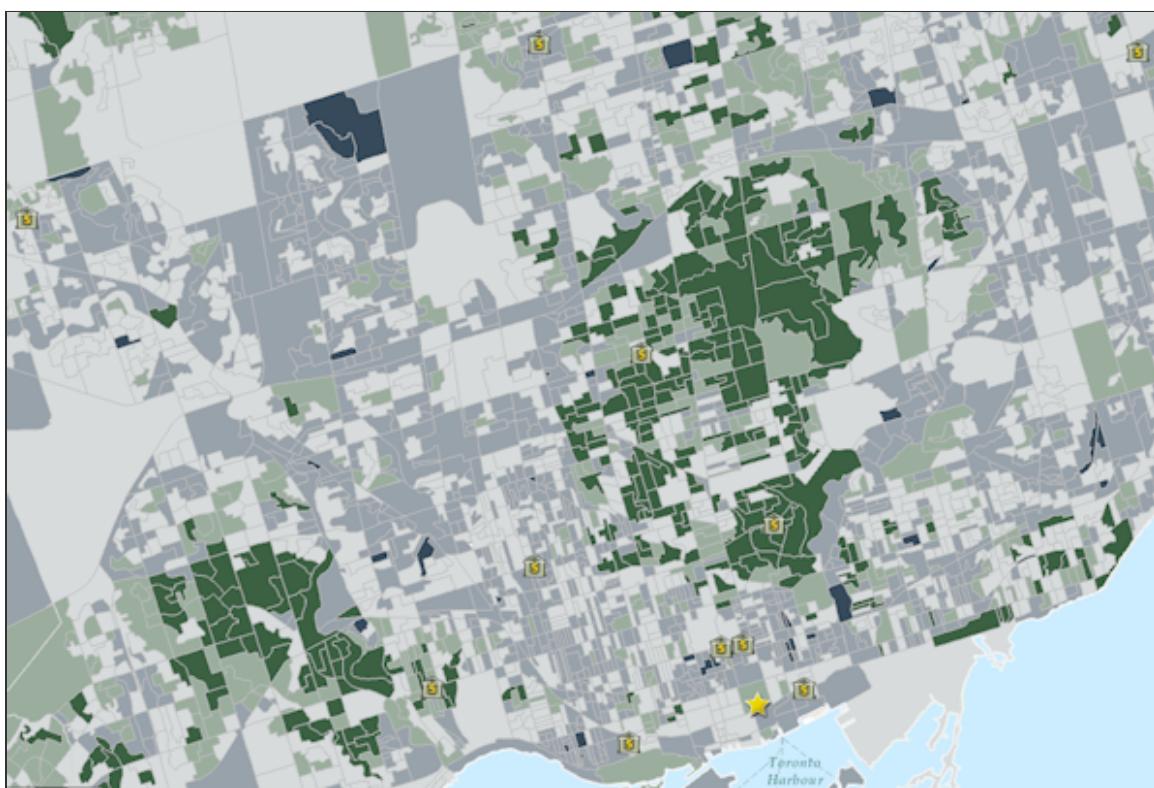


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7 Results Found

- [Canada Median Household Income](#)
by esri Add
- [Canada: 2006 Median Household In](#)
by ESRICanadaEd Add
- [2015 Canada Median Household Inc](#)
by esri Add
- [2016 Canada Median Household Inc](#)
by esri Add
- [2014 Canada Median Household Inc](#)
by esri Add
- [Demographics, Income and Labour](#)
by Province.Of.British.Columbia ↗

- f To the right of the 2016 Canada Median Household Income layer, click Add.
- g Click Done Adding Layers.





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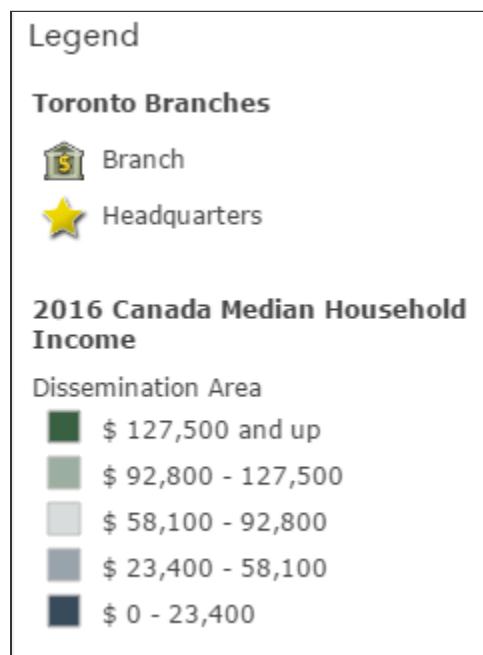
- h If necessary, zoom in to see the data broken down by smaller geographic segments.

As you zoom in on the map, this map layer automatically displays the information at finer levels of resolution. When you are zoomed out to smaller scales, the display is more coarse. This happens because showing too much detail at smaller scales would be too difficult to see, and it would also take longer to display.

- i Click the Legend button to view the [Legend pane](#).



The legend shows the symbols you chose for the bank branches and headquarters. It also displays the color ramp that was used to show the different levels, or classifications, of median household income in the map region.



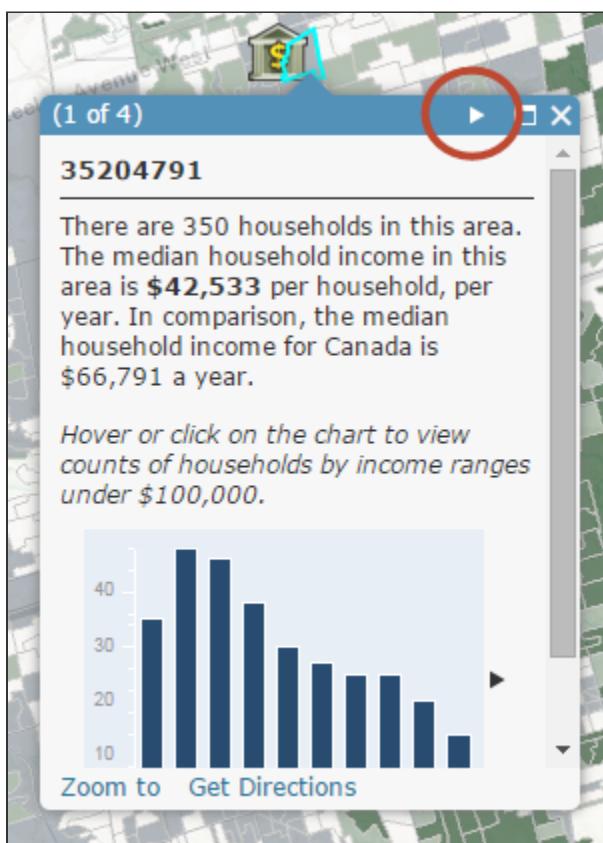
You can also see the legend for a layer in the Contents pane.

- j Click the Content button to go back to the [Contents pane](#).
- k Click the Toronto Branches layer name.

Contents

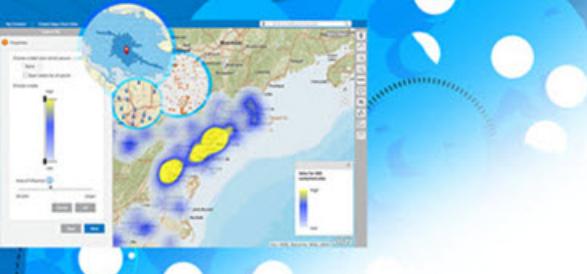
- Toronto Branches
 -  Branch
 -  Headquarters
- ▶ 2016 Canada Median Household Income

- 1 In the map, click any area to view an information pop-up with details about the median income. Examine the median incomes for the areas near the different Toronto branch locations.



Note: If there is an arrow at the top of the pop-up, use it to scroll through results for nearby areas.

Management is interested in understanding the characteristics of the population in the areas where bank branches are located as part of a larger discussion related to promoting new bank



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services. What (if any) spatial patterns or relationships between branch locations and income of the nearby population do you see? This information can be used to make decisions about which services to promote in the different areas.

- m Close any open information pop-ups.

Step 9: Add more information

Another useful characteristic for management to use would be the **average size of families** who live in the areas near bank branches. Where are smaller or larger households located in this area? How will this spatial information affect the marketing of targeted bank services?

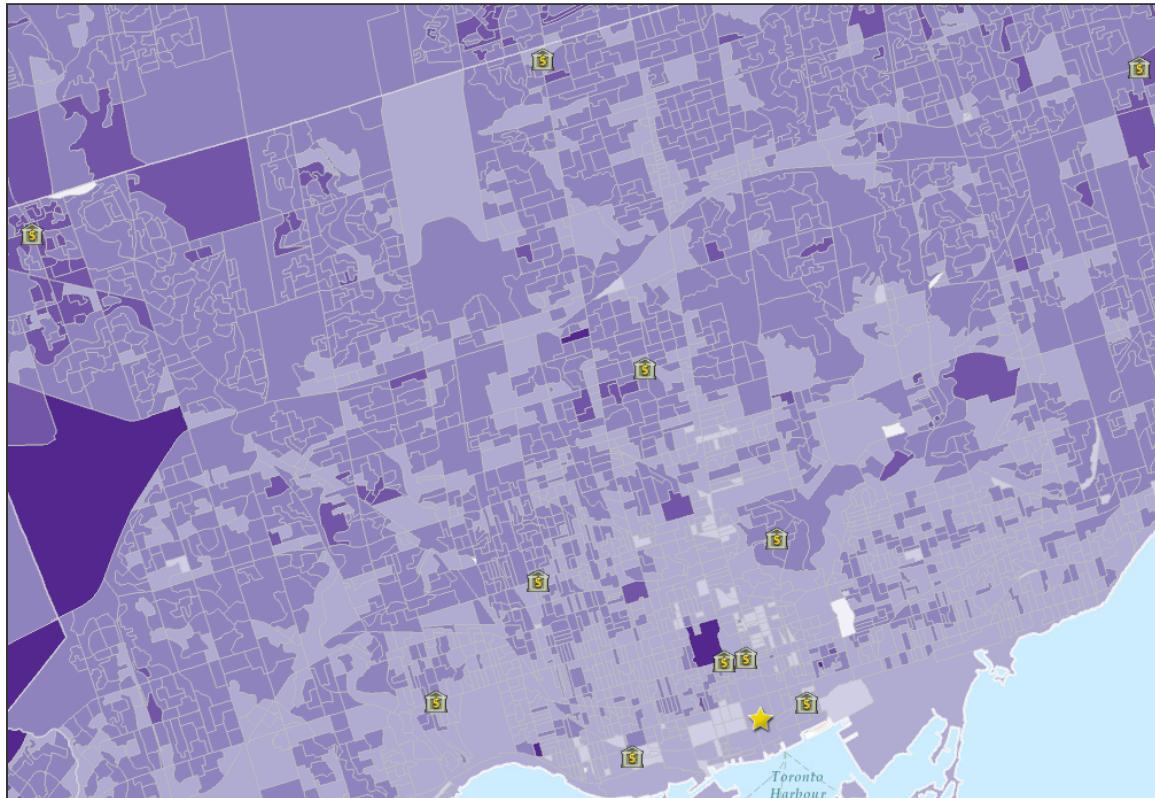
In this step, you will **add a layer for average family size** to the map.

- a From the ribbon at the top of the ArcGIS Online window, click Add and search for layers.
- b In the Find field, type **Canada average family size**.
- c For In, choose ArcGIS Online from the drop-down list.
- d Click Go.

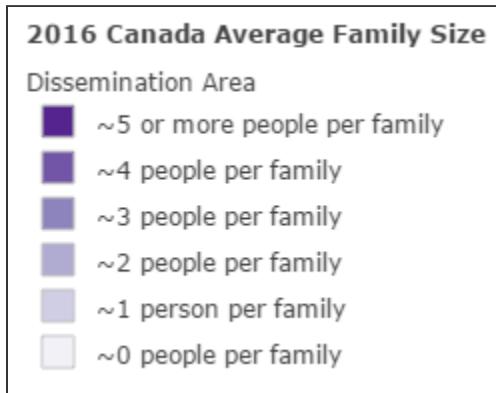
9 Results Found		
2014 Canada Average Family Size		Add
2015 Canada Average Family Size		Add
AAFC Plant Hardiness Zones, 1967 (feature service)		Add
Canada Average Persons per Census Family		Add
2016 Canada Average Family Size		Add
U.S. Monthly Climate Normals (1981-2010)		Add
U.S. Daily Climate Normals (1981-2010)		Add

- e Find the **2016 Canada Average Family Size** layer authored by Esri, and click Add.

- f Click Done Adding Layers.
- g If necessary, zoom in to see a more detailed view.



- h Switch to the **Legend pane** again, and examine the results.



- i You can again explore the map by clicking on it and clicking through the pages in the associated information pop-ups to learn more about the areas near the bank branches.



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Do you notice any relationships between family sizes and location of bank branches? What about family sizes compared to median household income? Can you think of why this might be?

- j Close any open information pop-ups.

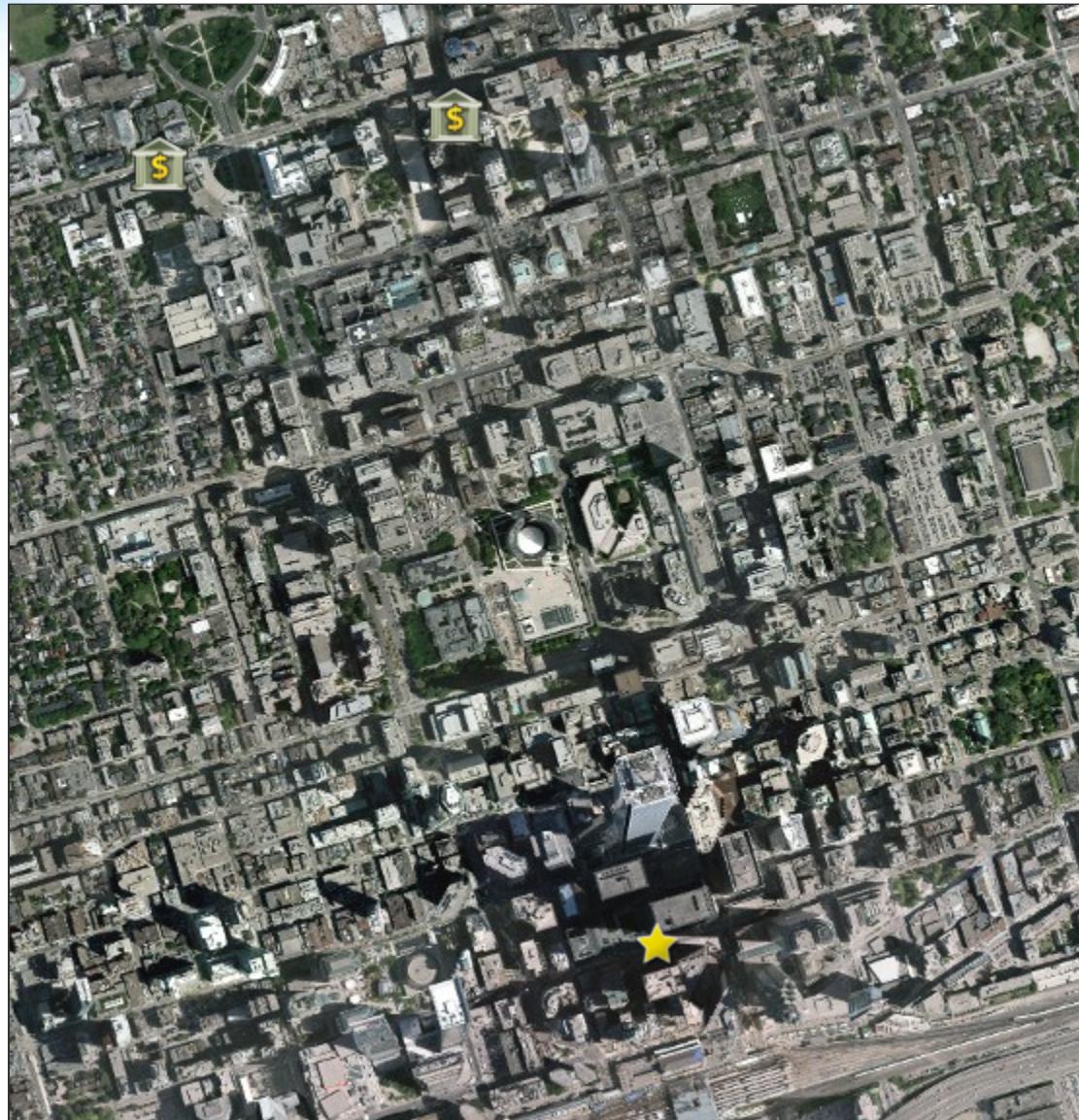
Step 10: Change the basemap

To provide geographical context, it will help to use different views of the city of Toronto, as you can gain different information from each view. You will change the basemap to use a satellite image and zoom in to the city to see a more realistic view of the concentration of branches located there.

- a In the Contents pane, turn off the 2016 Canada Median Household Income and 2016 Canada Average Family Size layers by unchecking the check boxes to the left of the layer names.
- b From the ribbon at the top of the ArcGIS Online window, click Basemap.
- c From the drop-down list, choose the Imagery basemap from the options shown.
- d Zoom in to the bank locations at the south (toward the bottom of the map), near the water. You may need to zoom in several times and pan the map to find the Toronto city center.



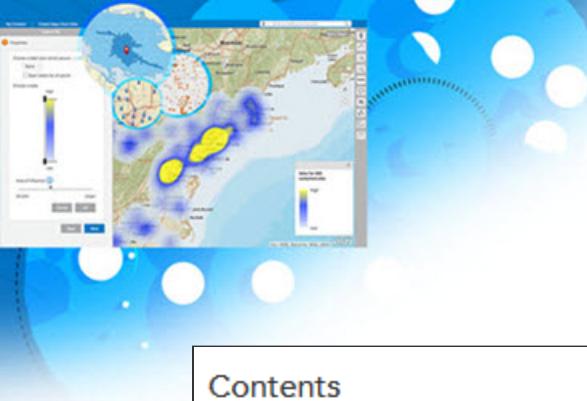
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Note the multiple-story buildings in the city center, near the bank headquarters. Does there seem to be a spatial relationship with bank locations and the city center? Do you think banks might also often be located near other businesses or other corporate headquarters?

Now, you will use the Zoom To control to zoom back out to the extent of the Toronto Branches layer.

- e In the Contents pane, hover your mouse pointer over the Toronto Branches layer name and click the **More Options** button .



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Contents

- Toronto Branches**
 -
 - [Zoom to](#)
 - Transparency
 - Set Visibility Range
 - Move up
 - Move down
- 2016 Canada Aver**
- 2016 Canada Medi**
- World Imagery**

- f From the drop-down list, choose **Zoom To**.

The map should dynamically update and return to the original view, or extent, with all of the Toronto bank branches visible.

- g In the Contents pane, turn the income and family size layers back on.

- h Save your map.

Note: **Saving your map with all layers on** is important for the following step.

The final step in the four-step decision-making workflow involves interpreting your findings. The resulting information can help you identify spatial patterns and lead to answers to your original question. What are the income or population characteristics of the areas where the bank branches are located? Which new bank services should be promoted in areas with different characteristics?

These findings are useful to you so you can gain knowledge about your branches and their customers and then make recommendations to your managers to be used in decision making.

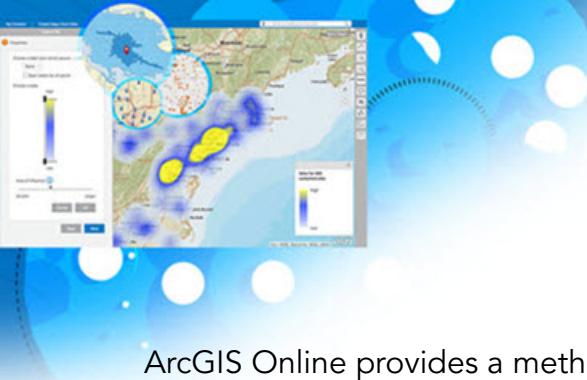
You are satisfied that management personnel can use the work you have done so far. Now that you have seen some relationships among your bank locations and other variables, you will share your findings.

Next, you will add the map you just created to a story map to illustrate your analysis results for the bank manager.

Step 11: Create and share a story map

In this step, you will use the ArcGIS Online web apps feature to help easily communicate your findings.

- a At the top of the window, click **Share**.



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ArcGIS Online provides a method of creating web apps, which can be used to compare different thematic layers. One type of web app, a story map, allows you to visually communicate the information in your map layers, and can be useful for summarizing data and communicating analytical results to an audience. You can share web maps or web apps with your organization so anyone else employed with Sixth Consolidated Bank can see your results.

- b** In the Share dialog, check the box next to **The Location Advantage** to share the map with the organization.
- c** Click **Create A Web App**.
- d** On the left, click **Build A Story Map**.
- e** Scroll down and click **Story Map Swipe And Spyglass**.



- f** Click **Create Web App**.
- g** Enter the following metadata:
 - Title: **Toronto Area Analysis**<_yourfirstname.lastname>
 - Tags: **Toronto, branches, demographics, Sixth Consolidated**
 - Any appropriate Summary, such as **This web app allows users to compare areas in the Toronto area on median household income versus average family size.**
- h** Verify that the app will be saved in your student folder.



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Create a New Web App X

Specify a title, tags, and a summary for the new web app.

Title:

Tags: Toronto branches demographics Sixth Consolidated Add tag(s)

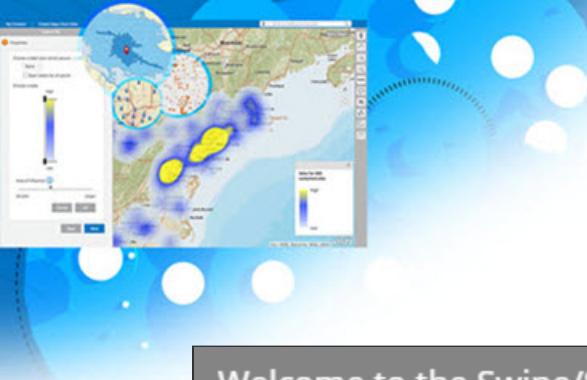
Summary: (Optional)

Save in folder:

- i Click Done.

After the map data is loaded into the app, the Swipe/Spyglass Builder dialog will open.

- j The Vertical Bar layout is selected by default, so click Next.
- k Select the 2016 Canada Average Family Size layer as the layer you want to be swiped and click Next.
- l On the next screen, clear the Enable Description check box.



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Welcome to the Swipe/Spyglass Builder

Swipe Style Swipe Type **App Layout** Pop-up

Select the layout settings.

Enable Description
 Enable Legend ⓘ
 Enable Swipe series ⓘ
 Enable pop-up
 Enable an address search tool
 Enable a 'Locate' button on supported browsers ⓘ

UI preview

← Previous Next →

m Click Next.

n There won't be any pop-ups to display, so click Open The App.

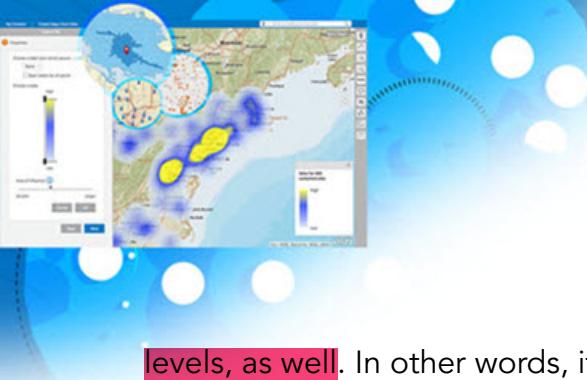
You can now drag the dividing line between the two maps back and forth to compare the levels for each variable for a particular geographic location. Also notice that the **legend appears but can be minimized** using the arrow at the bottom.



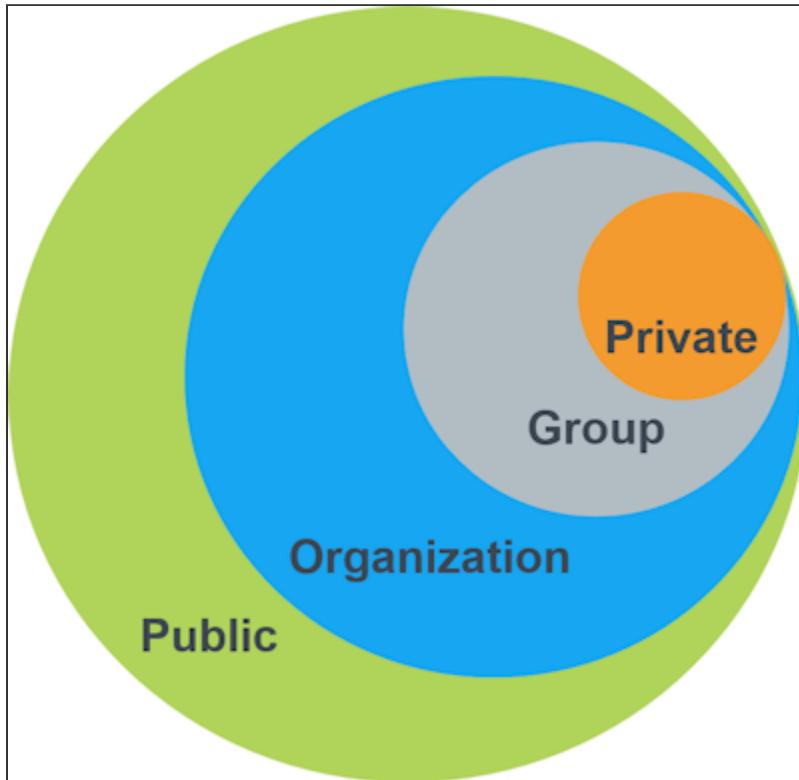
- o If necessary, zoom in to see the data broken down by smaller geographic segments.
- p Explore the map by panning and zooming in to different areas, and drag the divider back and forth to compare areas based on the two data parameters.
- q At the top, click **Save**.

This app would be useful for sharing analysis results dynamically with your management or others in your organization. If it was not already shared, you could add or change sharing settings at the top. You could send the URL of the app to members of your organization, or they could find it by searching for it by title or tags.

The default is that items are shared privately, so only the creator can see them. You can also share items with select groups within your organization (such as project teams), the whole organization, or anyone in the general public. Items are automatically shared with any lower



levels, as well. In other words, items shared with the public are also visible to your organization, and possibly to groups within your organization.



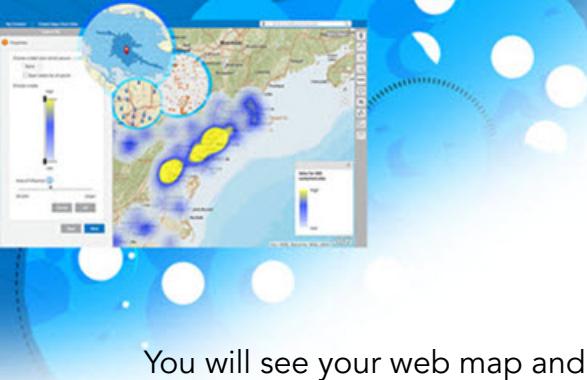
- r In the browser, click the Back button to return to the web map.
- s Turn off all layers except for **Toronto Branches**. This is important for the exercise in the next lesson.
- t Save the map.

Step 12: Locate your content

You can find the map and web app and any other content you create in the My Content section.

- a At the top of the ArcGIS Online window, click Home.
- b From the drop-down list, choose **Content**.

On the left, you see folders for organizing your ArcGIS Online content. On the right, you see the folder contents. These folder items can be maps, map layers, web applications, and more.



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You will see your web map and app displayed here. Throughout this course, all content you create will be saved to your My Content collection.

Title	Modified
Toronto Area Analysis_John Smith	Web Mapping Application Sep 28, 2017
SixthConsolidated_JohnSmith2	Web Map Sep 28, 2017

- c In the folder contents list, for the SixthConsolidated map, click the ellipses icon
- d From the drop-down list, choose View Item Details.

In the details page, you can see settings and metadata about the map, including sources of the map layers you added, with URLs, properties, and even comments people have made about your item.



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SixthConsolidated_JohnSmith [Edit](#)

[Overview](#) [Usage](#) [Settings](#)

[Edit Thumbnail](#)

 Visualization of bank branches in the Toronto area
by [john.student.locadv](#)
Last Modified: September 28, 2017
[Web Map](#)

[★ Add to Favorites](#)

Description
Add an in-depth description of the item.

Layers

Toronto Branches
2016 Canada Average Family Size
2016 Canada Median Household Income
World Imagery
World Imagery

Access and Use Constraints
Add any special restrictions, disclaimers, terms and conditions, or limitations on using the item.

Comments (0)

Note: Comments may or may not be enabled; this is an organization setting controlled by your ArcGIS Online organizational site's administrator.

Step 13: Sign out of ArcGIS Online

When you have finished the activity and are done exploring ArcGIS Online, you can sign out.

- a At the top of the ArcGIS Online window, click your name.
- b From the drop-down list, choose **Sign Out**.



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Conclusion

After reviewing the work you have done, your manager is happy with the story map and feels that it provides a good foundation for a discussion about promoting new bank services.

In this exercise, you looked at how you can incorporate visual analysis using mapping software to learn about locations, and you learned how location can help decision making. In this scenario, you used geospatial techniques to gain insight about branch locations and population characteristics in those areas. Based on the findings, decisions could be made regarding the promotion of new bank services. You can use the techniques you used in this activity whenever your data has a location component—and most data does. For any industry, including geospatial techniques in your data analysis can improve your toolset and help you make more informed decisions.

In future sections, you will perform more complex analyses that will yield more business-specific information. You will combine data to produce information that can lead directly to taking action, increasing profits through business expansion, and increasing your competitive advantage.

Unable to download?



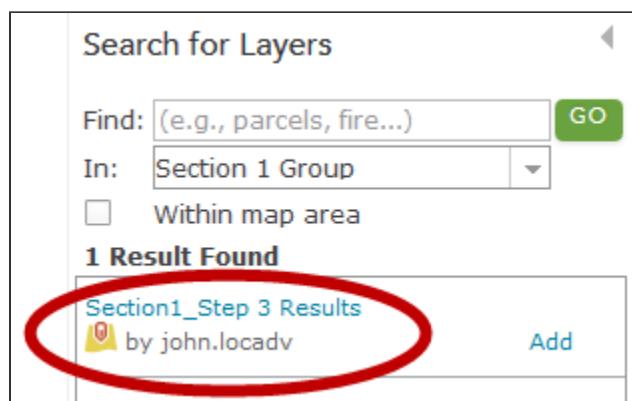
These steps are only for students who are working on a device that does not have download capabilities, such as a tablet, and are unable to download the .csv file.



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Follow these steps to add a layer that has already been geocoded and published. If you are able to import the bank branches points layer, you do not need to perform these steps.

1. At the top of the ArcGIS Online window, click Map, and from the ribbon at the top left, click Add.
2. Choose Search For Layers.
3. Change the In drop-down field to Section 1 Group, uncheck the Within Map Area check box, and find the Section1_Step 3 Results layer.



4. Click Add, and then click Done Adding Layers.
5. In the Contents pane, hover over the newly added banks layer and click Change Style.

The Change Style pane shows that the default symbolization chosen for the locations is by postal code.

6. For Choose An Attribute To Show, select Address.
7. Skip Step 4 in the exercise and continue on to Step 5.