

# Creating Web Maps using ArcGIS Online

## Using City of Windsor Open Data & Canadian Census

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In this tutorial, we are going to have some fun with online mapping! You will learn how to create an online map based on the City of Windsor open data and the Canadian Census data by using a free, web-based mapping platform – [ArcGIS Online](#). Specifically, you’re going to create a map showing different kinds of community assets (as shown in the table below) that would address the city’s newcomers’ diverse needs and comparing the location of these assets to the geographic distribution of target population – recent immigrants.

You’ll start by downloading geospatial data that represent those community assets from the City of Windsor Open Data Catalogue. Next, you’ll add these data layers to ArcGIS Online to make a community asset map. Then you’ll add an existing web layer that contains a list of census variables that describe demographic attributes for each dissemination area (i.e., neighbourhood) in Windsor. You’ll display the layer in a way that can illustrate how the percentage of immigrant population varies by Windsor’s neighbourhoods. Lastly, by showing the location of newcomer service agencies on top of the percentage of immigrant population, you can discover if there is a spatial mismatch between the distribution of the newcomer services and the distribution of the populations in need. Such information may help social services administrators to locate areas with potential service gaps and areas that require client outreach.

Asset Name	Data Format	Data Sources
Community centres	Shapefile	City of Windsor Open Data Catalogue: <a href="https://opendata.citywindsor.ca/">https://opendata.citywindsor.ca/</a>
Schools	Shapefile	
Transit Bus routes	Shapefile	
Social services for newcomers	Spreadsheet (.csv)	<a href="https://drive.google.com/file/d/1TGx_1KPmkd3nCNOVvO5iMuUSMP-1pCCe/view?usp=sharing">https://drive.google.com/file/d/1TGx_1KPmkd3nCNOVvO5iMuUSMP-1pCCe/view?usp=sharing</a>

## Getting started: downloading the City of Windsor open data

You can download the CSV file that contains a list of social services for newcomers from [https://drive.google.com/file/d/1TGx\\_1KPmkd3nCNOVvO5iMuUSMP-1pCCe/view?usp=sharing](https://drive.google.com/file/d/1TGx_1KPmkd3nCNOVvO5iMuUSMP-1pCCe/view?usp=sharing). You’ll download the data for another three assets (community centres, schools, transit bus routes) from the City of [Windsor Open Data Catalogue](#), which features datasets available to the public for general use (see the [City of Windsor’s Open Data Terms of Use](#) for details).

1. To assess the data, go to <https://opendata.citywindsor.ca/>

On this page, the City of Windsor publishes a number of datasets (many in geospatial format) on municipal services and facilities. You can browse all the available data by using the page navigation button in the bottom right corner. You can also narrow down the data by using the **Filter by resource type** button or the **Search** box (to search a specific dataset by its name). For example, you are interested to find and download a dataset about the city’s schools. In the **Search** box, enter your search term “schools” and press the Enter key.

Filter by resource type:

All

Search:

schools

The page will update to show a list of available data, including a brief description of the data as well as different file formats for download.

2. Once you have found data you are interested in (e.g., schools), you can click the “+More” button to look for more detailed description about the dataset. You can download the data by choosing a desired file format. In this example, you’d like to use data that are in ESRI shapefile format and projected in UTM, NAD83, Zone 17 Metric (UTM83). So You’ll choose download “Schools\_UTM83.zip” from the list.

### Schools

These point files represent the location of various schools within the boundary of the City of Windsor, from four school boards, for both Elementary and Secondary Schools. [+More](#)



### Relevant Downloads:

- [Schools\\_LL84.zip](#) (05/10/2019)
- [Schools.kmz](#) (05/10/2019)
- [Schools.dwg](#) (05/10/2019)
- [Schools\\_UTM83.zip](#) (05/10/2019)
- [Schools.csv](#) (05/10/2019)

5. Continue to download the other two datasets yourself: transit bus routes and community centres.

Filter by resource type:

All

Search:

bus routes

### Transit Bus Routes

These files are created from polylines and contain the Route Number, Directions travelled and any notes regarding the routes. [+More](#)



Filter by resource type:

All

Search:

community centres

### Community Centres

These point files contain the Name, Address, URL and X&Y Coordinates of each of the City's owned and operated community centres. [+More](#)



### Note:

A Shapefile dataset will be downloaded in a compressed file (.zip) that contains the .shp, .shx, .dbf, and .prj files that comprise the shapefile. You can directly add a shapefile as a .zip file to ArcGIS Online and turn it into a map layer (as long as there are fewer than 1,000 features in the shapefile). In other applications, you may need to uncompress a .zip file before using it.

For more information about adding shapefile to ArcGIS Online, please refer to this [post](#).

## Mapping with ArcGIS Online

### Step 1: Sign up for a public account

ArcGIS Online can be used without setting up an account, however, it also means not being able to save your maps and applications. For the purpose of this exercise, you will set up a free ArcGIS public account, which you can use to access ArcGIS Online with limits on usage.

1. Open a web browser to <https://www.arcgis.com/home/index.html> and Click the **Sign In** link on the upper right.
2. If you already have an account you can just enter your username and password and click “Sign In”. If you don’t have one, you can either sign in using your Facebook or Google credentials, or you can click “Create an account” which will redirect you to a page to create a new account. On that page, make sure you choose “Create an ArcGIS Public Account” option:

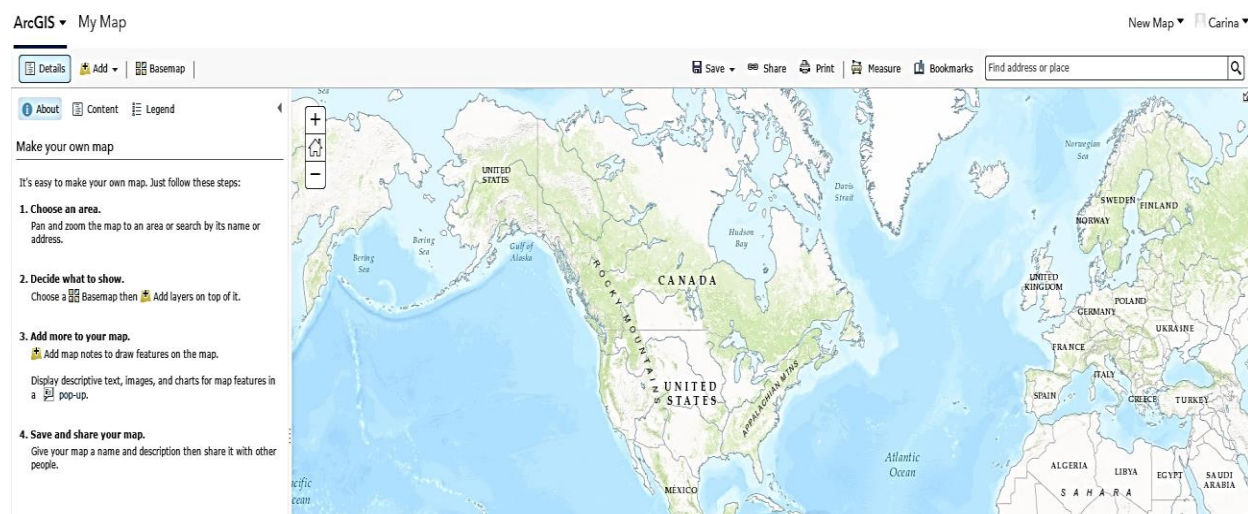
[https://www.arcgis.com/sharing/rest/oauth2/signup?client\\_id=arcgisonline&redirect\\_uri=http://www.arcgis.com&response\\_type=token](https://www.arcgis.com/sharing/rest/oauth2/signup?client_id=arcgisonline&redirect_uri=http://www.arcgis.com&response_type=token). Once you have created a public account, you can sign into ArcGIS Online to create and share content with limits on usage.

### Step 2: Locate the study area

The first step in working with your map will be to choose an area to work in. In this example, you’ll locate Windsor, Ontario, on a map in ArcGIS Online, and then you’ll choose a basemap to provide a neutral background for your map.

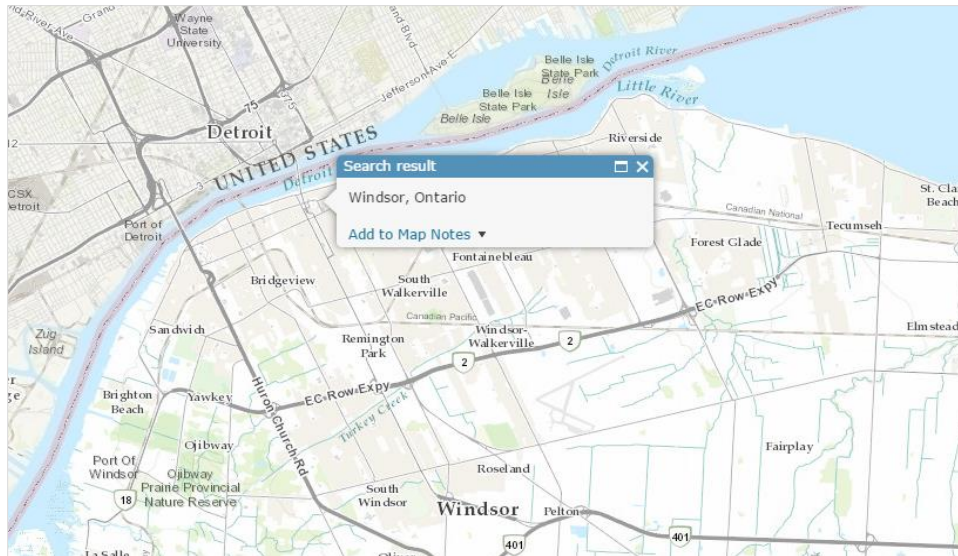
1. Sign in to your [ArcGIS public account](#).
2. On the ArcGIS Online toolbar, click on the **Map** tab to open the built-in map viewer.

This will pull up a new blank map named **My Map** (you can change the map title after you save it).



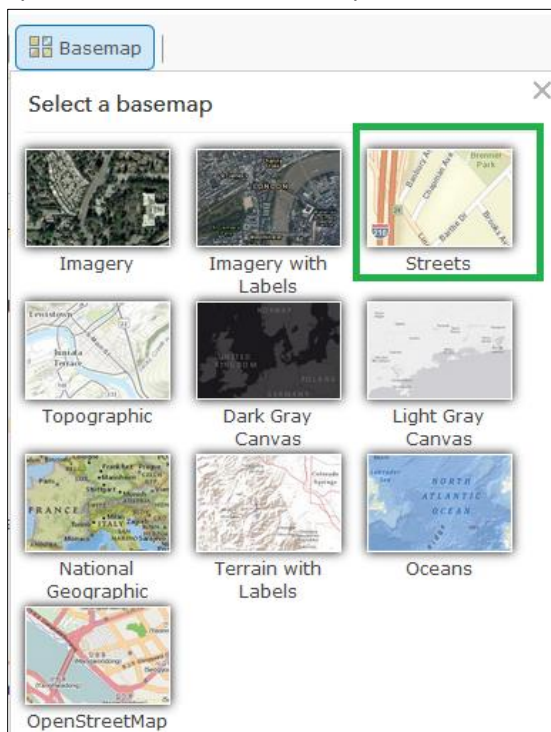
**Tips:** If you are in a new ArcGIS Online session, clicking **Map** will open a new map. Otherwise, it will open an existing map (the last map you were using). If an existing map opens, click **New Map** in the upper right corner of the page, and choose **Create New Map**.

3. In the **Search** box to the upper right of the map, type **Windsor, ON**. In the list of suggested locations, click **Windsor, ON, CAN**. Your map is automatically zoomed to Windsor and a pop-up appears at the location.



Every new map starts with a basemap which provides geographic context for the data you would like to display on the map. By default, it is topographic map (as shown above). However, for this example, it's more useful to have a street map underneath the community assets. So next you'll choose a street map as a basemap.

4. Click the **Basemap** button in the left upper corner of the map, and choose **Streets**. The map will update with the new basemap.



At this point, take a moment to **Save** the map and give it some information. Note that the map extent will also be saved, so make sure you like the zoom level. Click on either the **Save** or **Save As** option and name the map. You can use the information below to populate the fields or come up with your own **Title** (something short but descriptive), **Tags** (keywords that are used for searching purposes), and

**Summary** (a brief description of what the map is or what it shows, e.g., this map is used to display a list of community resources that are useful to new comers in the city of Windsor).

### Save Map

Title:

Tags:     
Add tag(s)

Summary:

Save in folder:

**SAVE MAP** **CANCEL**

The map is saved with the specified title, tags, and summary. Once you've saved your map, it appears in **My Content**, which you can access from the content page in ArcGIS Online.

### Step 3. Uploading data layers

Now that you have an area, you can start to add data to your map. First, you are going to upload the data layers for the following community assets: newcomer social services, schools, community centres and transit bus routes.

#### Add a layer from a CSV file

First, you'd like to add a layer showing the social service agencies that provide support for the city's newcomers, which is a CSV file (i.e., "**NewcomerServices\_Windsor.csv**"). Next, you'll create a web map layer by adding the CSV file to a new map.

1. Return to the browser window with your Windsor map. (If you created an account and saved your map, open your map from your **My Content** page.)

2. Click the **Add** menu and choose **Add Layer from File**.

### Add Layer from File

Locate the file you want to import.

- Shapefile (ZIP archive containing all shapefile files)
- CSV or TXT files with optional address, place or coordinate locations (comma, semi-colon or tab delimited)
- GPX (GPS Exchange Format)
- GeoJSON (open standard format for simple geographical features)

File:  **Browse...**

**IMPORT LAYER** **CANCEL**

2. In the **Add Layer from File** window, click **Browse**. Browse to the location of the CSV file "**NewcomerServices\_Windsor.csv**".

3. Click the file to select it and click **Open**.

4. In the **Add Layer from File** window, click **Import Layer**.



5. In the **Add CSV Layer** window, for **County**, choose **Canada**.

In the table, the **Field Name** column lists the field names (column headings) from the CSV file. In the **Location Fields** column, the field names are matched to appropriate categories of address information for the specified country. Scroll down to the bottom of the window to make sure all the field names have been interpreted correctly.

## Add CSV Layer

Locate features using:

☐ Latitude/Longitude ☒ Address ☐ None, add as table

Country: Canada

Review the location fields. Click on a cell to change it.

Field Name	Location Fields
Name	Not used
Address	Street
PostalCode	Postal
City	City

ADD LAYER

CANCEL

6. Click **Add Layer**.

1 Choose an attribute to show

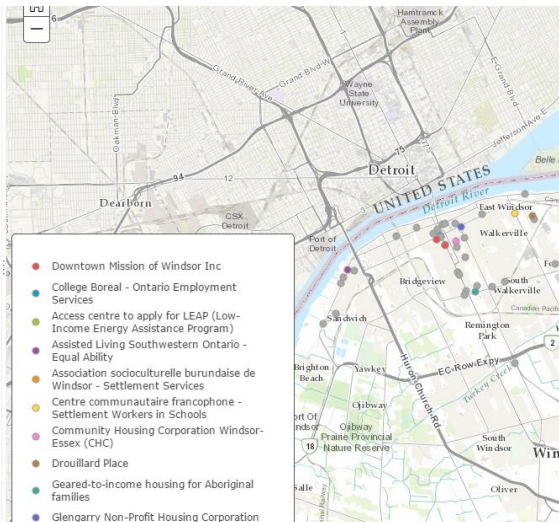
Name

2 Select a drawing style

Types (Unique symbols)

Heat Map

Location (Single symbol)



On the map, a point symbol is drawn at the address of each agency. By default, the points are assigned unique colors on the basis of name. Other drawing options are shown in the **Change Style** pane. For this map, the individual names of agencies are not important. You are only interested in where these agencies are located, so next you'll give them all the same symbol.

7. In the **Change Style** pane, under **Choose an attribute to show**, choose **Show location only** from the drop-down list.

## Change Style

### Windsor Income Employment Support Services

#### 1 Choose an attribute to show

Show location only

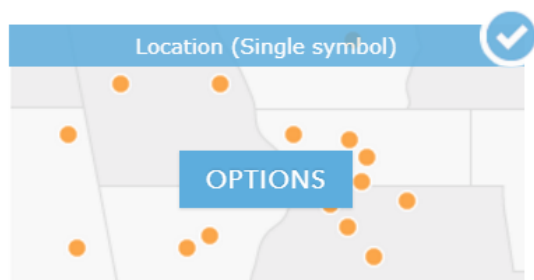
Under **Select a drawing style**, The **Location (Single symbol)** style now has a check mark to show that it's selected. On the map, all the income and employment support service agencies are drawn with a single symbol. Next, you'll change the default symbol to something that better represents social service agencies.

#### 2 Select a drawing style



8. Click **Options** for the **Location (Single symbol)** style and explore the variety of symbols available as well as transparency and other options.

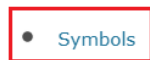
#### 2 Select a drawing style



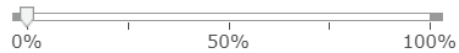
9. Under **Showing Location Only**, click **Symbols** to change the symbol.



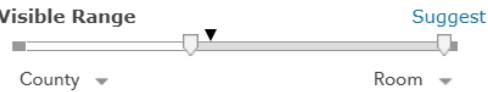
### Showing Location Only



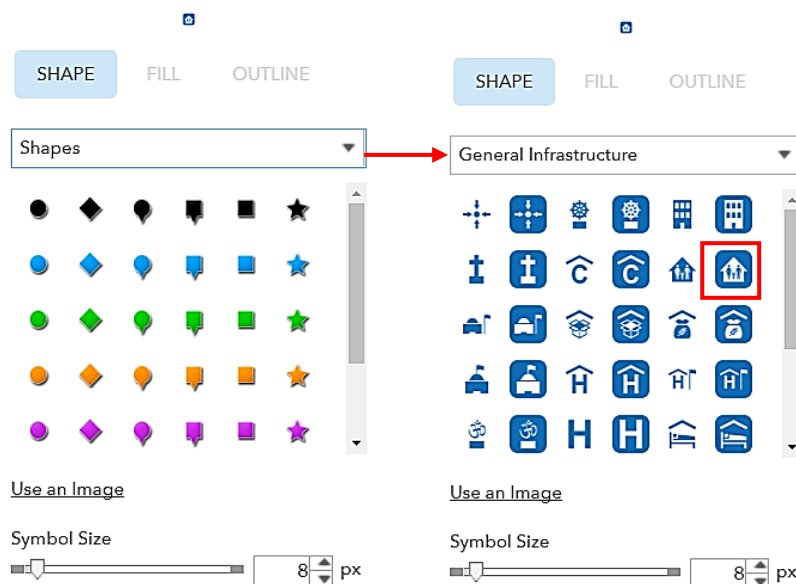
#### Transparency



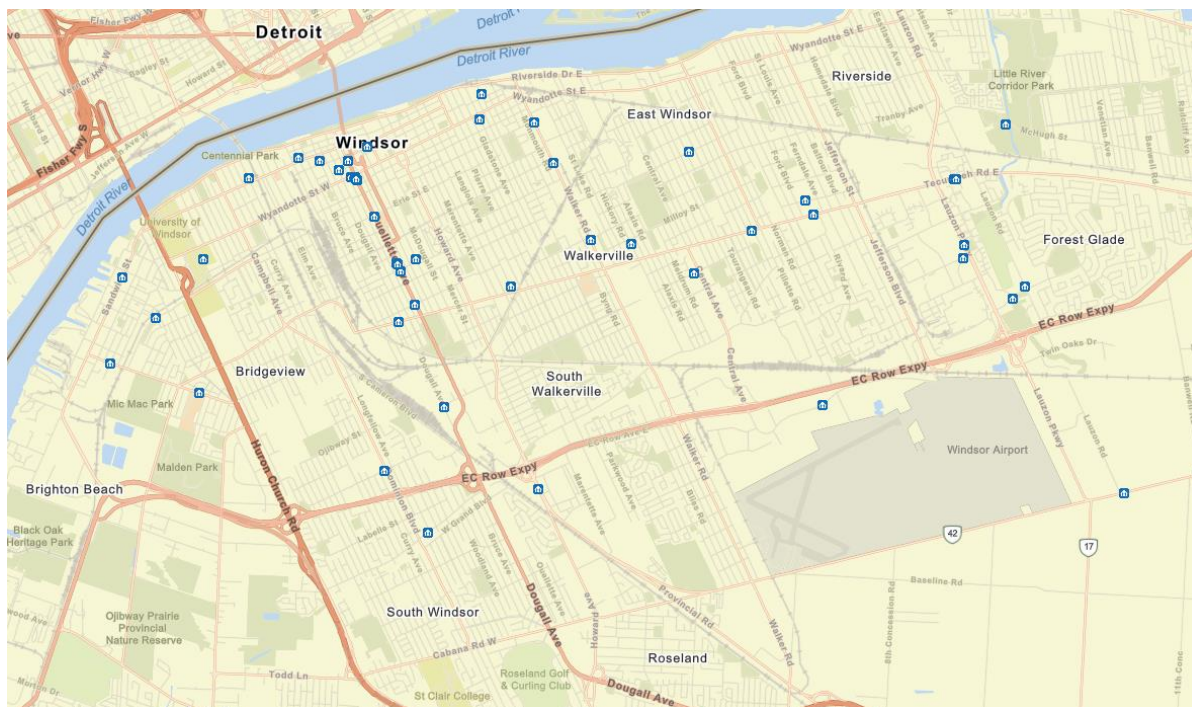
#### Visible Range



10. A symbol pane opens showing the shape, color, and outline options of the symbols on the map. Under **SHAPE**, it shows a variety of symbols that belong to the default **Shapes** category of symbols. There are also many other symbol categories. Click the arrow next to **Shapes** and change it to the **General Infrastructure** category.



11. In the **General Infrastructure** category, find the symbol with a family on a blue background and click it to select it. If necessary, you can change the size of symbol as well. After you are satisfied with your options, click **OK**, then click **Done** at the bottom of the **Change Style** pane to finish the process. The symbols are immediately updated on the map.



12. Save the map by clicking the **Save** button on the ribbon.

### Add layers from shapefiles

Next, you are going to add another three layers of community assets – schools, community centres and bus routes, which are all in shapefiles (in zipped format). Let's start with the school layer.

1. Click the **Add** menu and choose **Add Layer from File**.

### Add Layer from File

Locate the file you want to import.

- Shapefile (ZIP archive containing all shapefile files)
- CSV or TXT files with optional address or latitude, longitude (comma, semi-colon or tab delimited)
- GPX (GPS Exchange Format)

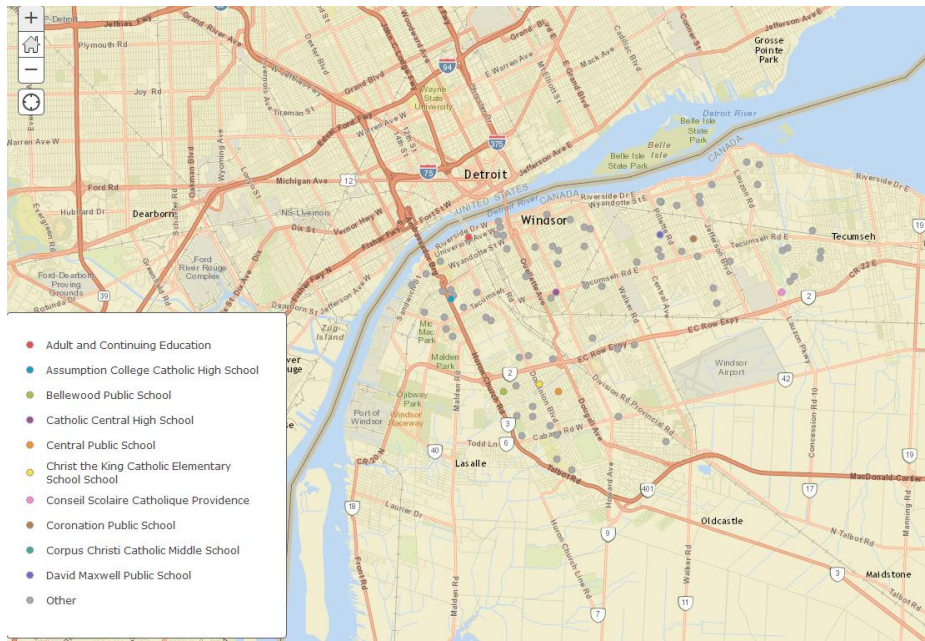
File:  No file chosen

Note: You can import shapefiles and CSVs with 1000 features or 250 address locations. No feature limits on GPX files.

IMPORT LAYER

CANCEL

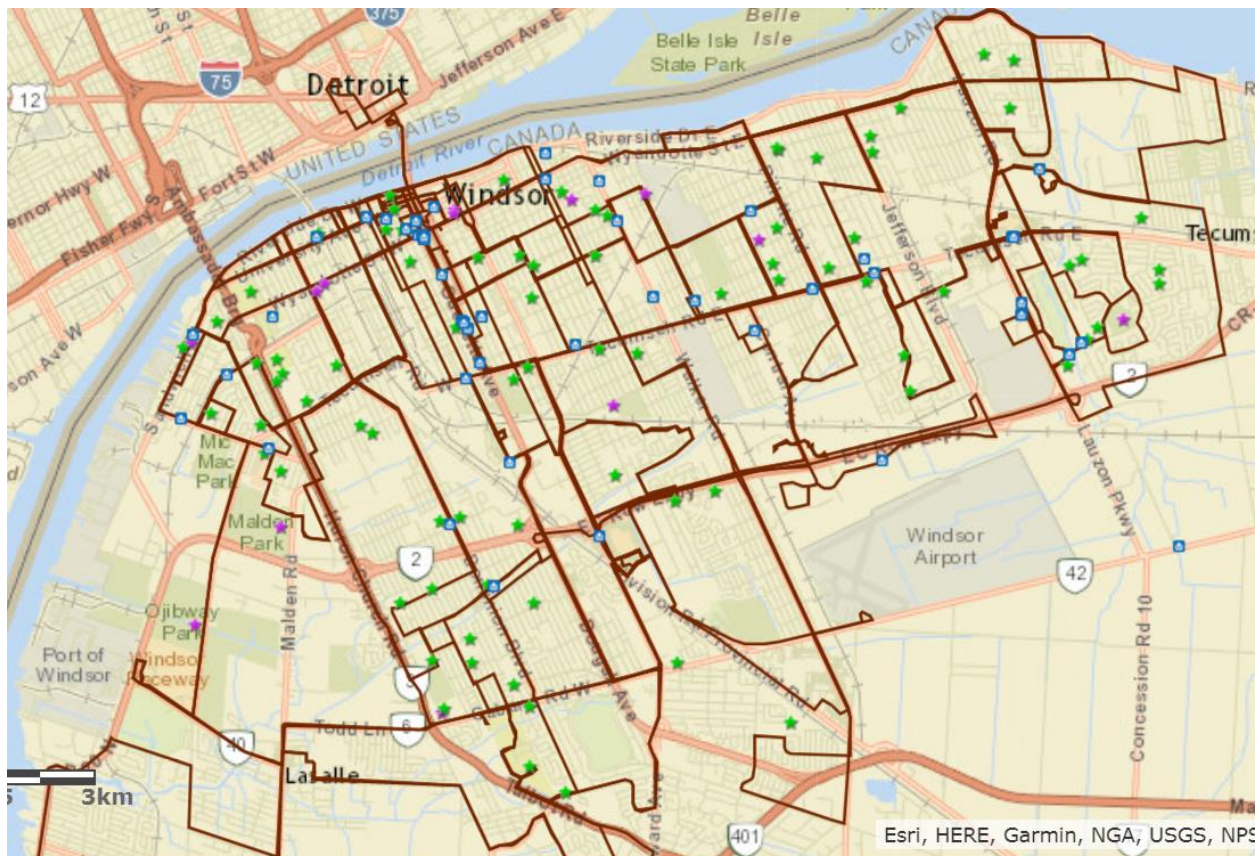
2. In the **Add Layer from File** window, click **Choose File**. Browse to the location of the school zip file ("**Schools\_UTM83.zip**"). Click the file to select it and click **Open**. Accept the default selection to **Generalize features for web display** and then click **Import Layer**. The school layer is drawn, with its defaulted symbol on the map. You can change its symbol by following the procedures described above.



3. Continue to upload another two layers of assets – community centres ([Community\\_Centres\\_UTM83.zip](#)) and transit bus routes ([Transit Windsor Bus Routes\\_UTM83.zip](#)) from your computer. Modify their symbol styles if you like.

Congratulations! Your community asset map is complete! See the example map below.





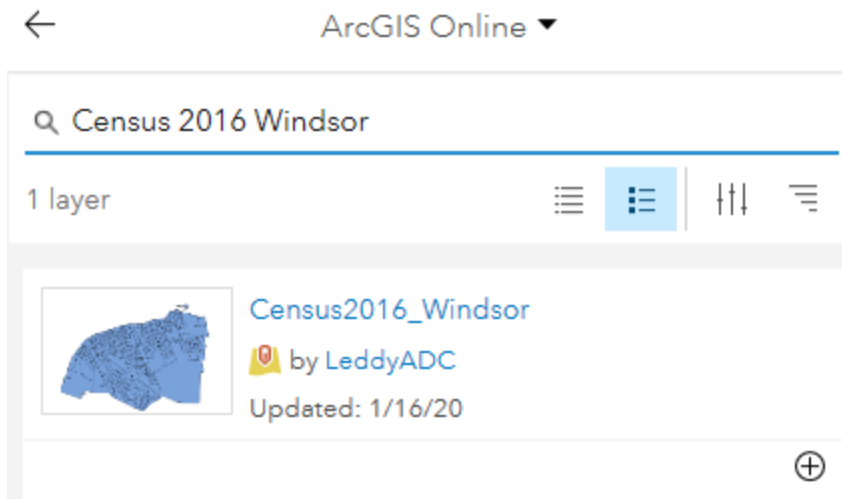


#### Step 4: Adding an existing layer

In the previous sections, you have examined the geographic distribution of newcomer services in the City of Windsor. It would be also interesting to know where these locations are in relation to the populations in need – the immigrant population. Next, you'll add an existing web layer that contains a list of census variables that describe socio-economic and demographic attributes for each dissemination area (i.e., neighbourhood) in Windsor. You'll display the layer in a way that can illustrate how the percentage of immigrant population varies by Windsor's neighbourhoods.

[Search for the layer and add it to the map](#)

1. On the **Contents** pane, check the boxes next to the **Schools UTM83** layer, the **Community Centres UTM83** and the **Transit Windsor Bus Routes\_UTM83** layer to turn the layers off.
2. On the ribbon, click the **Add** button and choose **Search for Layers**.
3. In the **Search for Layers** pane, click the arrow and choose **ArcGIS Online**. In the  box, type "**Census 2016 Windsor**". In the list of results, locate **Census2016\_Windsor by LeddyADC**. Click  to add the layer to the map.

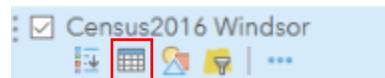


The newly imported layer is now visible in the **Contents** pane as well as on the map. Next, you'll style the layer to reveal spatial patterns in the data.


### Style the layer


The census layer is currently styled by location, showing all dissemination areas (DAs) in one single colour. Since you're interested to see how the percentage of immigration population varies by DAs, you'll change the style of the layer to show this variation appropriately. For doing that, first you'll view the attribute table associated with this layer to better understand the data it contains.

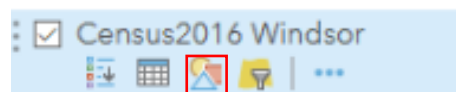
1. In the **Contents** pane, point to the **Census2016\_Windsor** layer and click the **Show Table** button.



The attribute table will open at the bottom of the map. Each row represents a feature (e.g., a DA) and each column (or field) provides different types of information about the features in the data. In this case, a list of demographic attributes for the DAs are listed as fields in the table. If necessary, use the scroll bar at the bottom of the table to scroll all the way to the right to see all the attributes included in the data. Next, you'll apply a style to the layer using the values of the **ReclImmigra** field.

**Tips:** In many cases, the field names in the attribute table can be difficult to decipher, as they are frequently truncated, abbreviated, or otherwise shortened. In this example, refer to the [item details](#) page to learn more about what each field name represents. To access the item details page, first point to the layer name, and Click the **More Options**  button and click **Show Item Details** or **Description** to open a page with detailed information about the layer.

2. Close the table by clicking the  in its title bar.
3. In the **Contents** pane, point to the **Census2016\_Windsor** layer and click the **Change Style** button.





3. In the **Change Style** pane, under **Choose an attribute to show**, select “**ReclImmigra**” from the dropdown list. The type of the attribute you selected determines the drawing style you see by default. This is known as [smart mapping](#), a useful feature provided by ArcGIS Online. In this case, smart mapping recognized that a numeric attribute (i.e. the percentage of immigrant population) was chosen, so it recommended **Counts and Amounts (Color)** as the default style, which is marked with a blue check mark.

#### Change Style

Census2016 Windsor

1

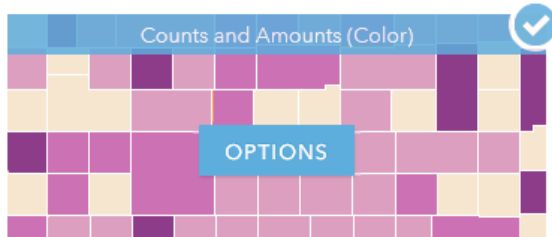
Choose an attribute to show

ReclImmigra

Add attribute

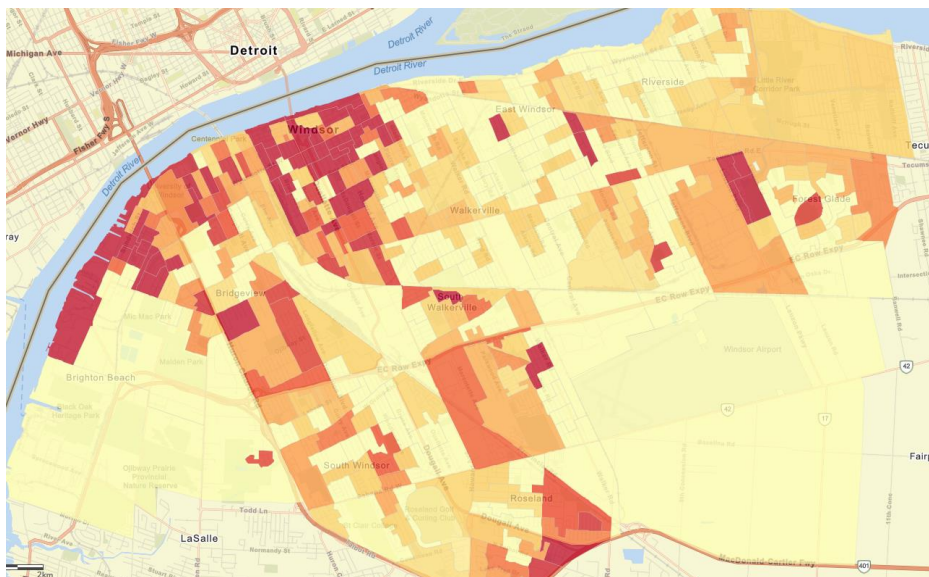
2

Select a drawing style



The layer automatically updates on the map with a default continuous colour ramp that represents low to high percentage of immigrant population. Areas with the lowest percentage of immigrant population are drawn with a light colour, while those with the highest values are drawn with a dark color. For now, you'll accept the default style.

4. At the bottom of the **Change Style** pane, click **OK**. Click **Done**.



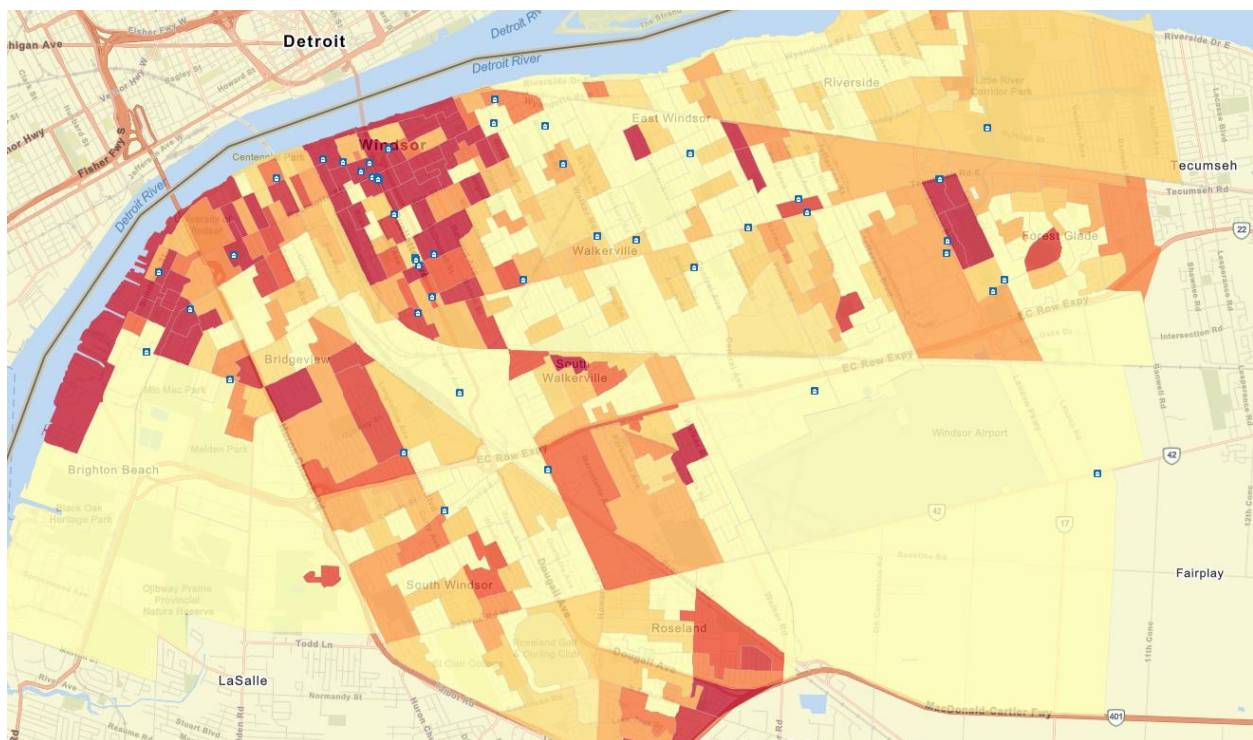
By applying the Counts and Amounts (Color) style to show the percentage of immigrant population by DAs, you can see a clear spatial pattern of higher concentrations of recent immigrants in certain neighbourhoods of Windsor: e.g., the city's west end, the university area, the downtown, the Roseland area in the south, as well as the Forest Glade area in the east.

The map now shows two key layers essential for your analysis: the immigrant population and the newcomer services agencies. However, you don't see the locations of service agencies very clearly because they are underneath the immigrant population layer. Next, you'll make some changes to improve your map.

5. In the **Contents** pane, point to the **NewcomerServices Windsor** layer. Click the **More Options** button and click **Move up**.

The layer moves up one position, above the **Census2016\_Windsor** layer. The services are now visible on the map.

*Note: The layers are drawn in the order in which they were loaded into the map. The usual practice is to put points (e.g. social services) above lines (e.g. streets), and lines above polygons (e.g. dissemination areas). Points, lines, and polygons are all feature layers: they usually represent discrete geographic objects that have more or less precise locations and boundaries. The basemap layer (e.g. topographic map) is a tile layer. Tile layers are images and cannot be manipulated in the same ways as feature layers. They typically represent large, continuous surfaces rather than discrete objects. Tile layers cannot be moved above feature layers in a map.*



Now, you have the map showing the locations of newcomer service agencies on top of the percentage of immigrant population by dissemination areas. What patterns have been revealed from the map?

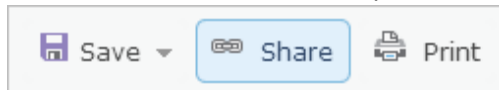
The number of newcomer service agencies is generally higher in areas with more concentrated immigrant populations, such as the city's west end, downtown and the Forest Glade area . However, there are still some neighbourhoods with a great concentration of immigrants having limited geographic access to these social services, like the Roseland area in the south. These underserved areas might be good locations for the city to offer new programs to help newcomers in need.

## Step 5: Share the map

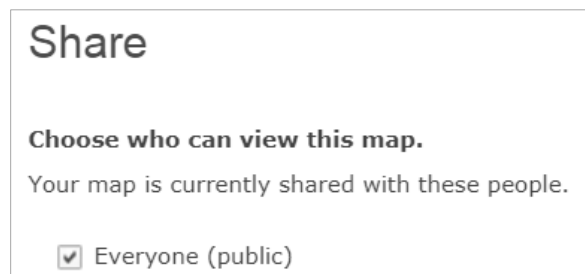
Finally you may want to [share the map](#) with your friends, colleagues etc. The fastest way to share a map is to share it with everyone and send an email that includes a link to your map. You can also [embed the map](#) in your personal website or [create a web app](#).

1. If necessary, open your Windsor map. (If you created an account and saved your map, open your map from your **My Content** page.)

2. On the ribbon above the map, click the **Share** button.



2. In the Share window, check the box to share the map with everyone.



*Note: By default, the web app you create will be shared with the public. If you are signed in with an organizational account and own groups, you may see an option to share your app with one of your groups instead of with the public.*

3. Copy the URL that appears in the **Link to this map** box, and paste into an email, instant message, and so on. You can also use the provided buttons to post your map to your Facebook and Twitter accounts, embed your map, and make an application.

### Link to this map

[Facebook](#)[Twitter](#)☒ Share current map extent

### Embed this map

[EMBED IN WEBSITE](#)[CREATE A WEB APP](#)

**Tips:** When you share a map through a link or embed it in a website, by default, the extent you last viewed is automatically captured and included in the link or embedded map. When the map is opened, it shows the extent you were viewing when you shared it. To make sure the default view of the map is correct, center and zoom into the map as you desire it to be displayed.  
You can only embed maps that are shared with everyone (public).

## More information about ArcGIS Online

- ArcGIS Online help  
<http://doc.arcgis.com/en/arcgis-online/>
- ArcGIS scenario-based exercises  
[ArcGIS Learn gallery](#)  
[The ArcGIS Book](#)  
[The ArcGIS Imagery Book](#)