

# GEOG 3100

## US & CANADA: CITIES, ECONOMIES, & SUSTAINABILITY

### Group GIS Exercise: Residential Development and Service Availability in Hillsborough County, Florida

**Overview:** In this group exercise, we will use GIS software to learn some powerful capabilities of geographic information systems to assist in understanding and solving urban problems.

In this exercise, you will analyze geographic markets using detailed business and geographic datasets and the Business Analyst Web Cloud GIS software. Your focus: to analyze a troubled residential development to uncover factors associated with its problem. Your goal: to understand the problems with the development so they are not repeated in other communities in the future.

**The scenario:** you are a GIS analyst for Hillsborough County, Florida (the county that includes the city of Tampa). Your job is to assess community characteristics and needs across the county to support local planners and developers. Your focus as GIS analyst is to provide insights based on your expertise in geography and in using GIS software.

Your specific task here is to analyze the situation of the Carriage Pointe residential development in Hillsborough County, located eight miles south of downtown Tampa. *Carriage Pointe is a neighborhood that was hard hit by recent economic downturns (many housing foreclosures, home abandonments, and a high inventory of unsold houses).* As a result, the government and development industry in Hillsborough County is working to gain a better understanding of neighborhoods like Carriage Pointe. The goal is to identify factors that likely contributed to the neighborhood's issues and help developers to avoid repeating these same problems in the future.



**Exercise Credit:** Dr. Murray Rice created this urban analysis exercise using data files and software provided by Esri, publishers of the *Business Analyst Web* cloud-based GIS package.

## Key Features of this GIS Exercise

There are three key features that you will find in this GIS exercise.

### **1. Tasks and Steps**

The exercise is divided into tasks (major milestones that collectively build to achieve the overall exercise goals) and steps (minor milestones that need to be completed to finish each task).

### **2. Rough Notes**

While some steps (as defined above) are simply activities you need to do in your analysis, a few steps are flagged as being part of your “rough notes”. **Each of these rough notes requests is highlighted in bold text.** Rough notes are steps where something needs to be recorded or saved. This might involve a brief, written comment that summarizes or gives your interpretation of something you just did in your GIS analysis (please record these notes in a Word document). Or, a rough note may involve simply saving a map image you have produced through your GIS work.

Please label each of these rough note responses using the task and step number associated with the bolded question you are answering – e.g. “Task 1, Step 1a”. All rough note material must be completed and submitted together in a separate “rough notes” document, but you need to understand that these notes are primarily for your reference and are not the ultimate product for the exercise. Lastly, please note that most steps in each task do not require that you record anything at all, although you will still need to complete every step in each task to complete the exercise.

### **3. Final Report**

This exercise concludes with a final challenge – create a concise document (no more than 4 pages plus supporting map material) that includes the following five sections:

- An exercise scenario description (summary of the Tampa Bay area situation outlined here),
- The question to be solved (this can be brief, but it needs to define the central problems addressed in the exercise),
- The analytical approaches used (the GIS techniques you use to produce your results),
- The results you obtained (including relevant maps and other results/insights extracted from your “rough notes”), and finally (and most meaningfully)
- A concise and impactful summary of the application of your work to the decision-makers you are supporting.

This final report can and should draw on the raw material (answers, comments, maps) you assemble in your rough notes, but you need thoughtfully assess which material to include (not all of this material will make it), and you need to use all of the writing skill you have to create a compelling and concise narrative that gives only the necessary information.

*Before you begin this location analysis exercise, here are two more important notes:*

1. *Maptitude* is a desktop software package that runs on your CSAM lab computer. This means that *Maptitude* uses storage space on your computer for all files being used and created in the course of your analysis. You would be wise to store all maps and other files you create on your own portable storage device, such as a flash drive or other portable electronic media: this will enable you come back to complete or modify your work later without re-doing your work.
2. Please provide “**rough note**” results or answers (using complete sentences) or other material (maps, graphics) for **any text printed in bold**. To help you see all of these rough note steps, this instructions document marks all rough note steps with an arrow symbol, like the one shown here:



## Task 1: Identify and Map the Carriage Pointe Location

1. To complete this assignment, you will need to start up two software packages:
  - a. Microsoft Word (or the Google Docs equivalent). Start this software and create a blank Word document named “*Exercise-RoughNotes.docx*” for your use as you progress through the lab.
    - As you work on the lab, you will collect maps and notes from throughout your GIS work in this rough notes Word document.
  - b. BA Web cloud GIS software, accessible anywhere you have internet access. However, there is value in starting to use this software in our UNT GIS lab facility so you have help if you need it. To begin, log into *BA Web* using the login information established for you in this course (you should see a login screen similar to the one below):

Log into Business Analyst

Sign In esri

Username  
|

Password

Keep me signed in

**SIGN IN**

[Forgot password?](#) [Forgot username?](#)

OR

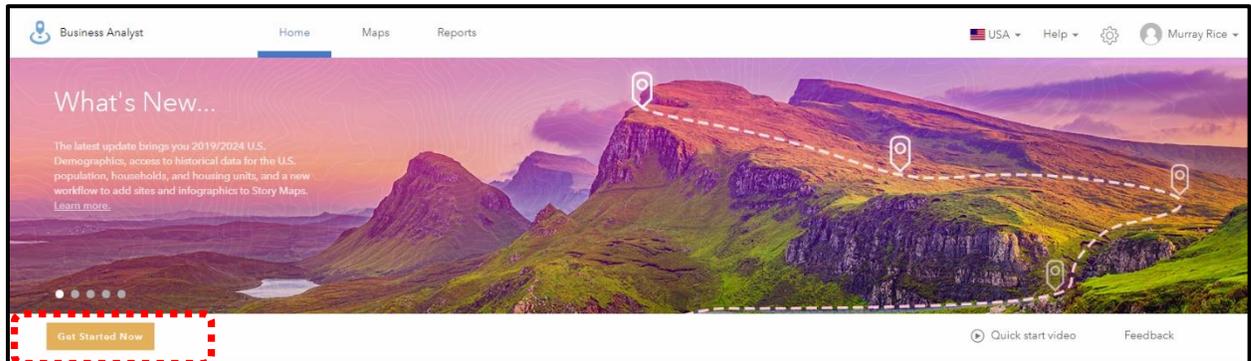
Sign in with **ENTERPRISE ACCOUNT**

Sign in with

**Current BA Web Login:**

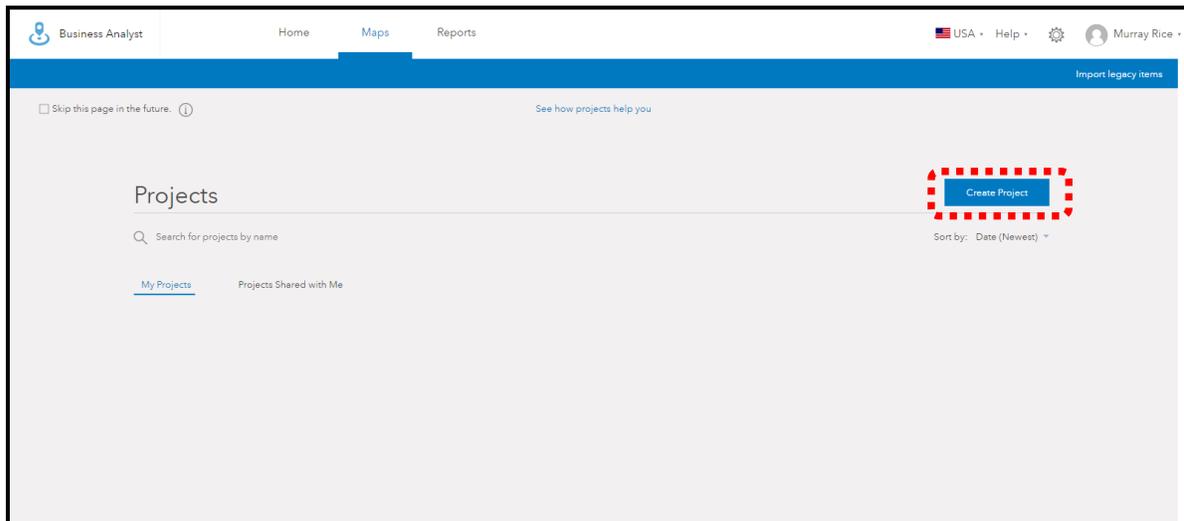
<https://bao.arcgis.com/esriBAO/login/index.html>

2. When you have successfully entered your login information for *BA Web*, you will see the *BA Web* start screen after a brief delay for loading:



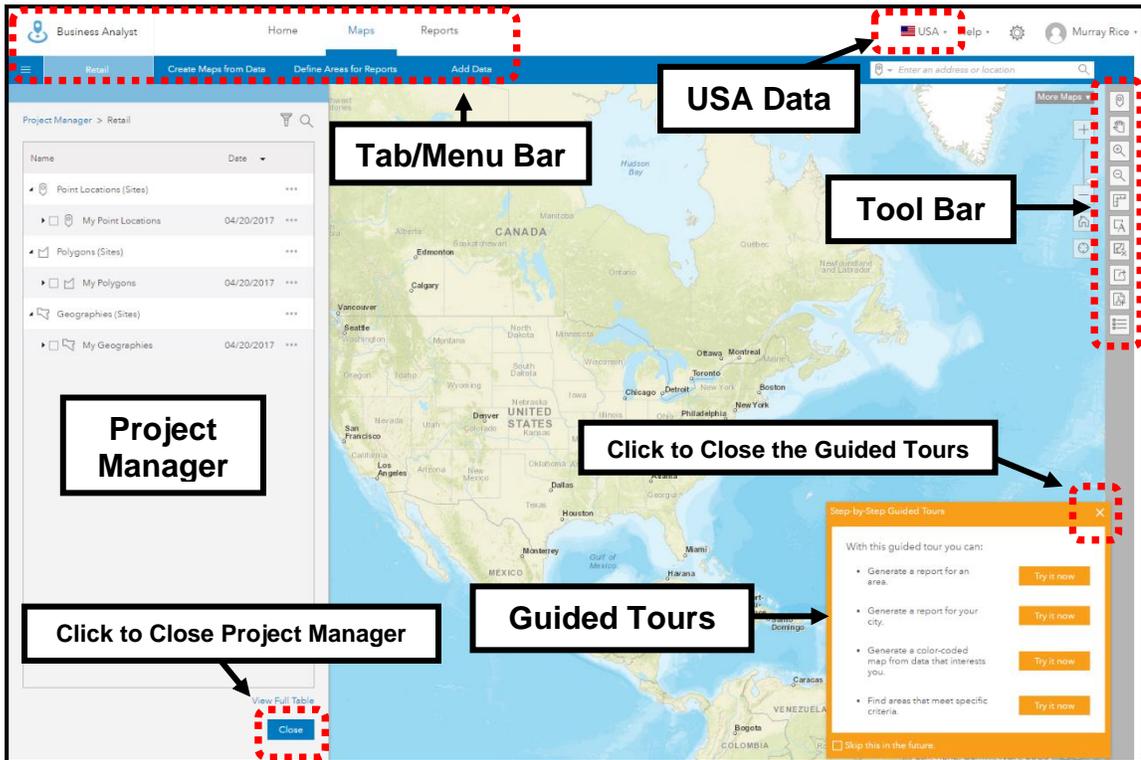
On this start screen, click on “Get Started Now” (orange button highlighted in red above).

3. The next screen you will be taken to is the *BA Web* “Projects” page:



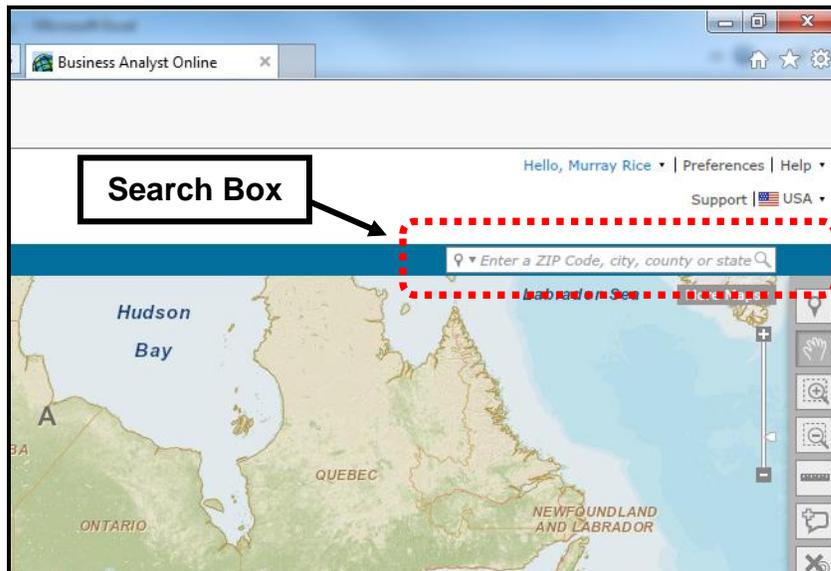
Click on the blue “Create Project” button (highlighted in red above). This will take you to a screen where you can name the current project (name this project “Tampa Community Analysis”, click “Save”, and wait for *BA Web* to finish creating this project).

- This will bring up an introductory screen for the Maps component of *BA Web*.

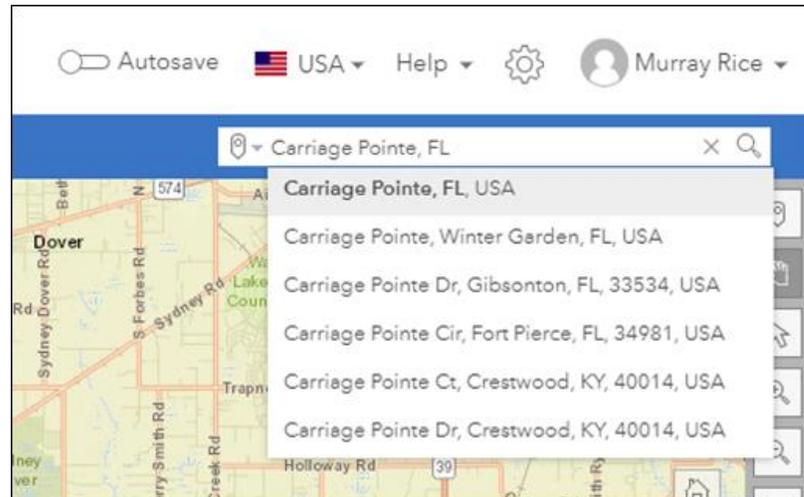


Click the "Close" button (X in the top right corner of the Guided Tours dialogue box) to close the Guided Tours options and begin to use *BA Web*.

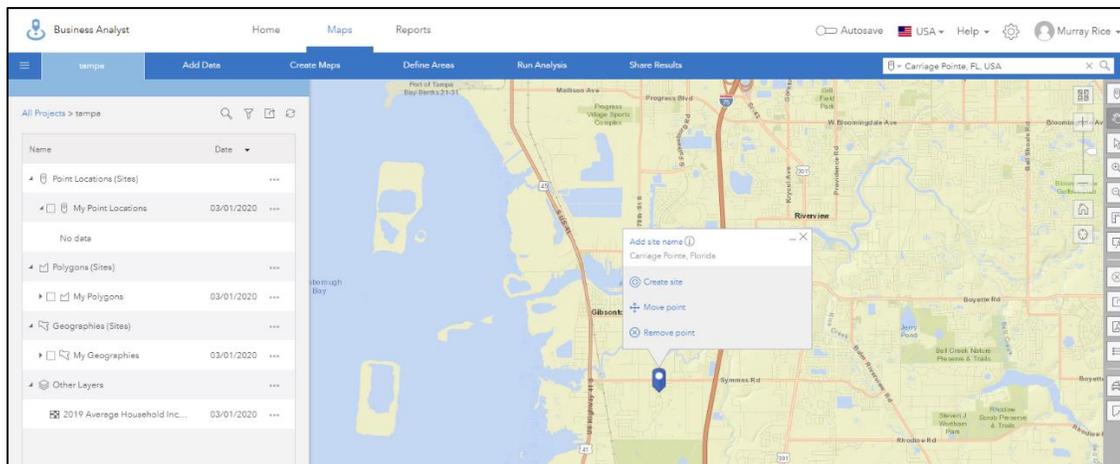
- To find a location by address, go to the "Enter a ZIP Code, city, county or state" search box in the upper right portion of the screen:



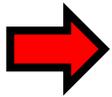
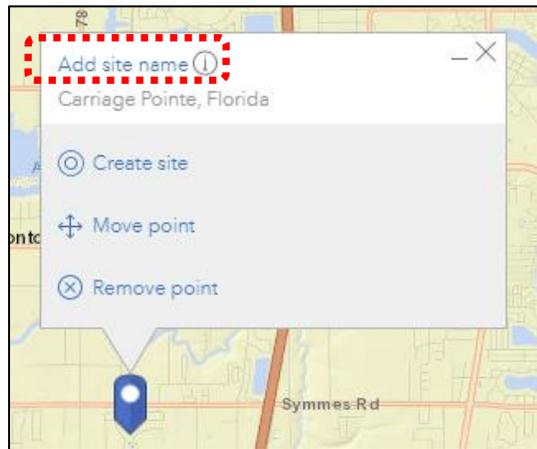
- In the search box, first type in the name of the Tampa-area community we want to analyze: Carriage Pointe, FL. When you have typed this in the search box, press the “Enter” key to add a pin at the location:



- After a brief time for processing, *BA Web* will give you a labeled map showing the location of Carriage Pointe:

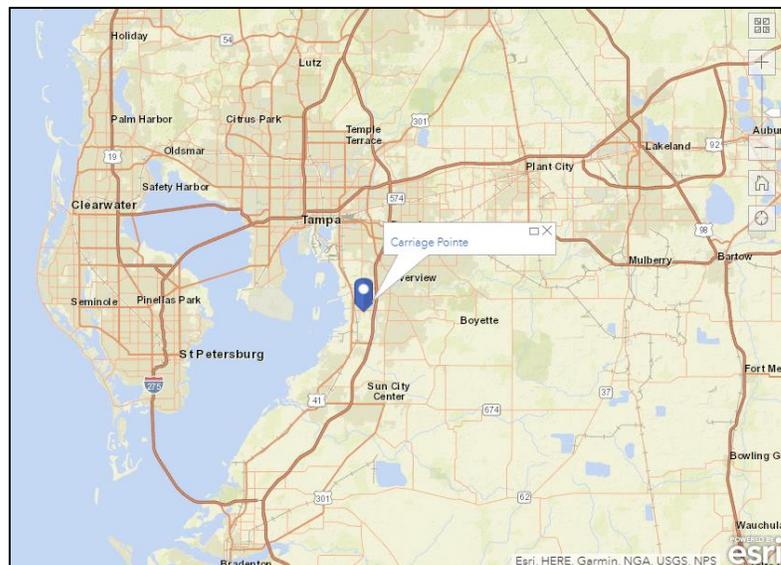


- In the white portion of the location label, it says "Add site name". Click on this text and type in the location label "Carriage Pointe".



- Map Save Step:** On your map as you have it now, zoom out to show some regional context and extract and paste it into the "rough notes" Word document you are developing (remember the Word document you started in task 1, step 1a). Please ask if you need any help in completing this map extraction/pasting step.

When you paste the map into your Word file, please place the map code "task1step9" immediately underneath this map in the Word document, like in the example below.

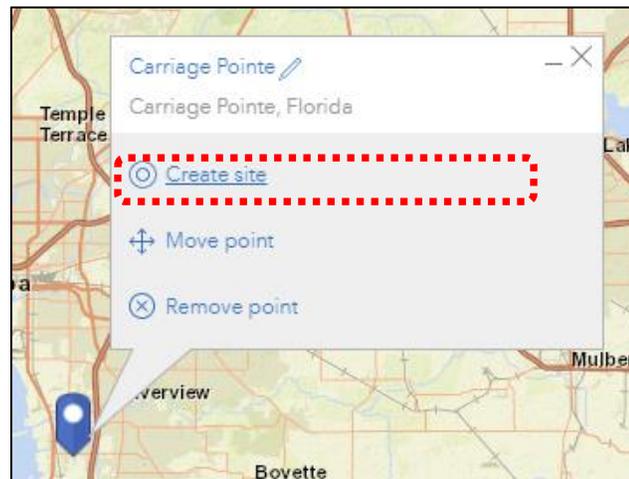


*task1step9*

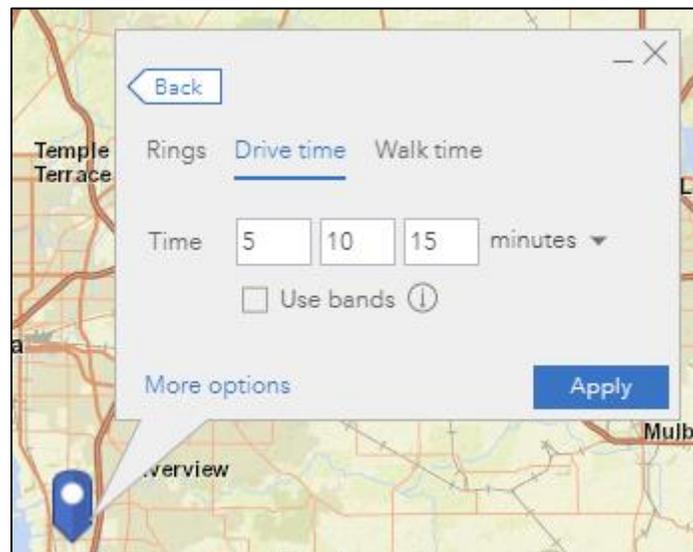
*Note: you will complete this same map copy/paste process again with more map images later in this lab.*

## Task 2: Add Drive Time Zones to the Analysis

1. Once you have this location mapped, the next step is to begin an analysis of the area surrounding the Carriage Pointe community using the site analysis features provided here:

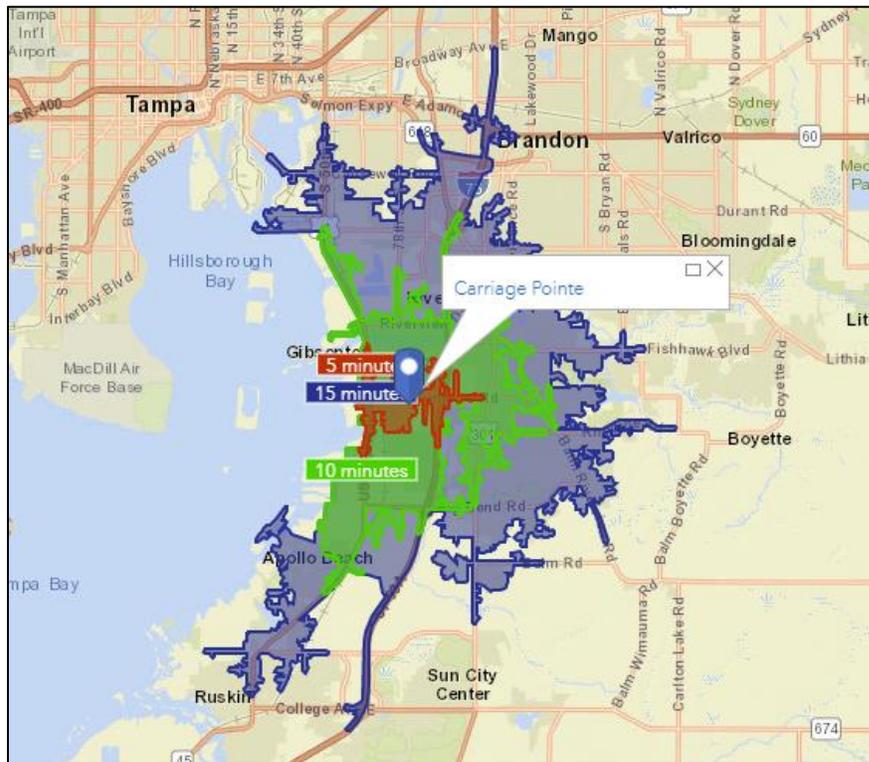


2. Click “Create site” to start this market area analysis. The “Rings” analysis will be highlighted by default, but a better way to define a service zone around many modern, suburban communities in America is to use the “Drive time” option, as reflected below.



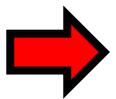
Ensure that the “Drive time” option is selected, along with the 5, 10, and 15 minute drive time zone definitions (as shown above). With these settings complete, click on the “Apply” button.

3. You should now see these three consecutive drive time zones on your Carriage Pointe map, similar to the below (your map may be somewhat different).

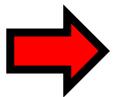


*task2step4*

These zones define the territory that is located within our 5, 10, and 15 minute drive times of the center of the Carriage Pointe community.



4. **Map Save Step:** Save this drive times map in your rough notes document. Place the map code “task2step4” with this map in your rough notes.



5. **Rough Notes Step:** please answer the following questions about the map.

- A. Describe the 5, 10, and 15-minute drive time zones that Maptitude has generated for Carriage Pointe. What is the shape of these zones? What is your best explanation for why the zones have this kind of shape? Why isn't the zone circular? Answer the above in one paragraph.
- B. Now that you see Carriage Pointe's drive time zone, explain why it can be useful to identify such a drive time zone when trying to understand a neighborhood and its prospects for the future. Why could such a zone be a meaningful characteristic of a neighborhood? Answer the above in one paragraph.

### Task 3: Adding Community Services from an External Data File

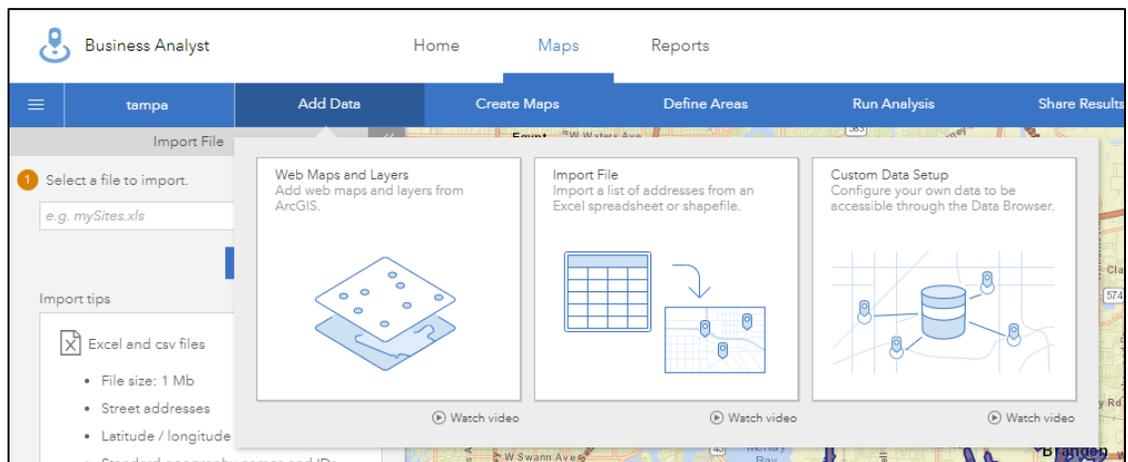
Our last analytical task is to add another level of detail to our location assessment. The key factor that we will investigate in this part of the project is the local status of community infrastructure: the location of businesses and community services around the Carriage Pointe development. Is it possible that the location and accessibility of community services in the area relates in some way to what has happened with Carriage Pointe?

To do this analysis, we will look at two basic kinds of indicators of community wellbeing:

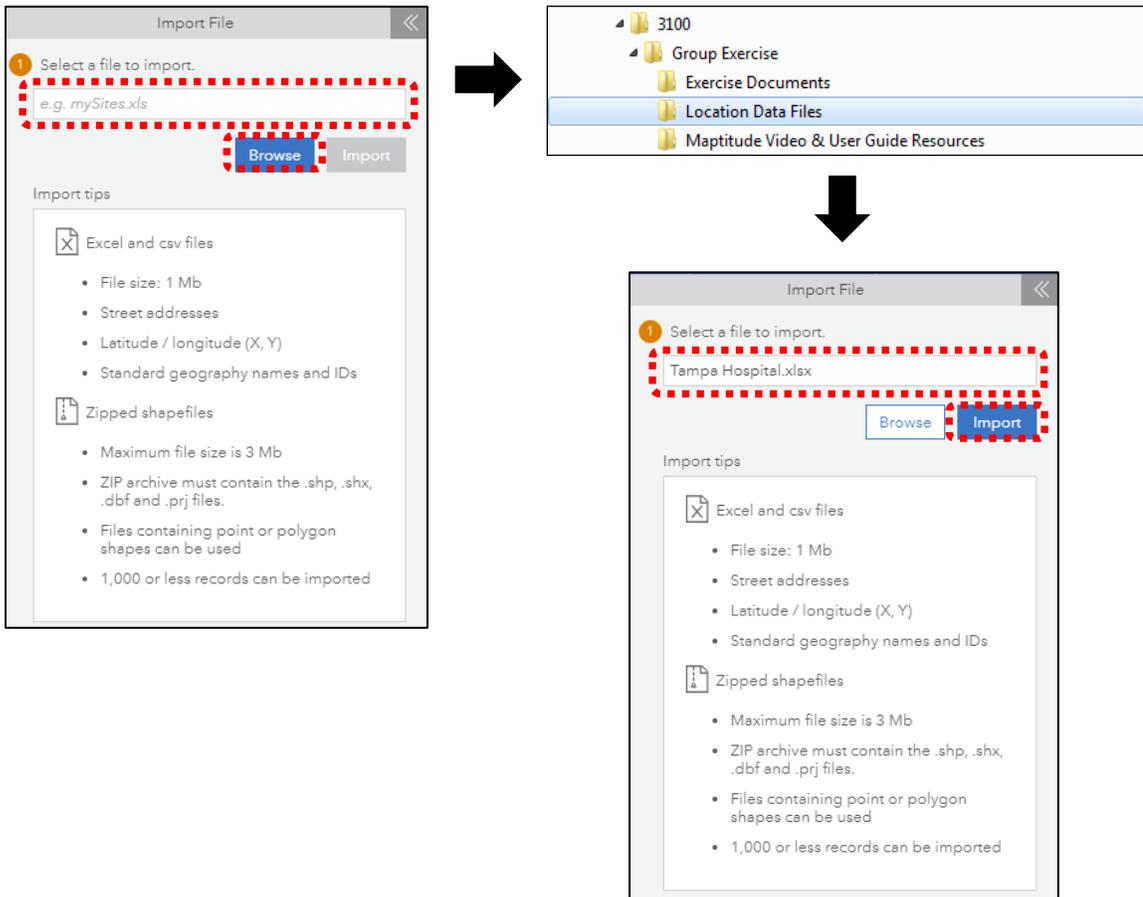
- A. *Hospitals*: The presence or absence of healthcare options in a region provides an indicator of the community's local access to basic public services. Access to health care is thus a key measure of overall community status and wellbeing.
- B. *Grocery Stores*: The grocery store chain Publix provides a broad range of food offerings to communities across Florida and the southeastern United States. Access to food is another primary indicator of a healthy community.

Maptitude provides a suite of mapping capabilities that can provide a variety of perspectives on the locations of stores and other public facilities.

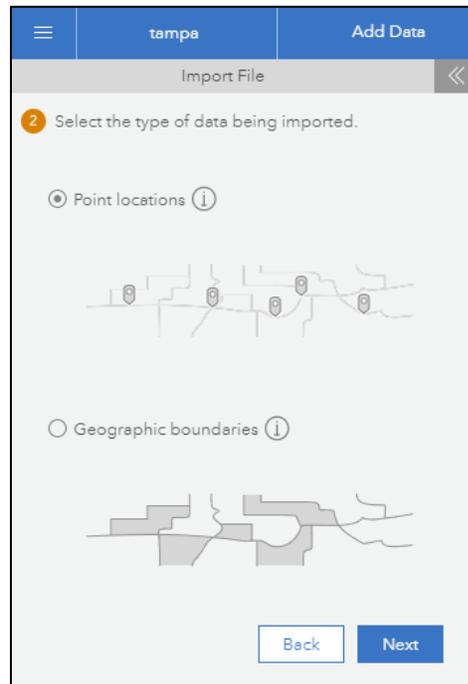
1. To start this community services analysis, let's put the location and distribution of local hospitals on our map. Go to Maps > Add Data > Import File, as shown below.



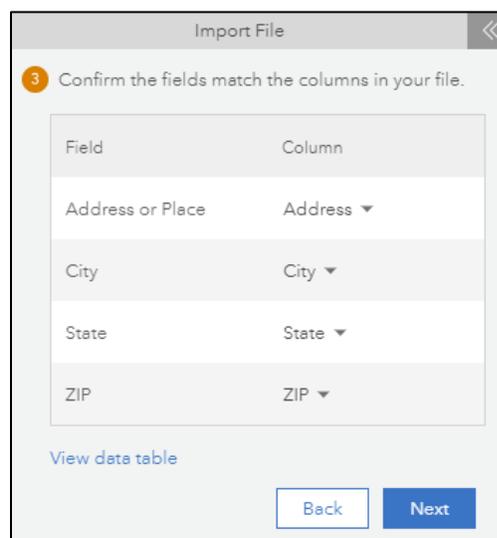
2. This will bring up the import file dialogue. In the “Select a file to import” box, navigate to the GEOG 3100 folder in your CSAM CLASS drive (see below left). In the “3100” folder, look for the “Group Exercise” subfolder, “Location Data Files” sub-subfolder, and find the “Tampa Hospital.xlsx” Excel file. When you have that Excel file selected and visible in the “Select a file to import” box (see below right), click OK to go to the next step.



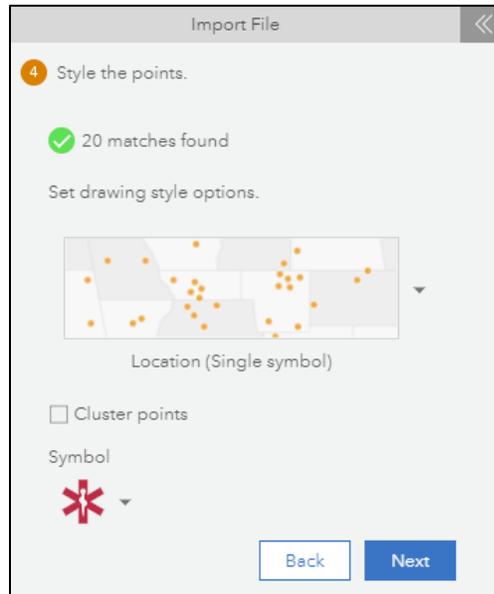
- Following this, BA Web will ask you the type of data being imported. The hospital dataset is a point location file. Select that option and click Next.



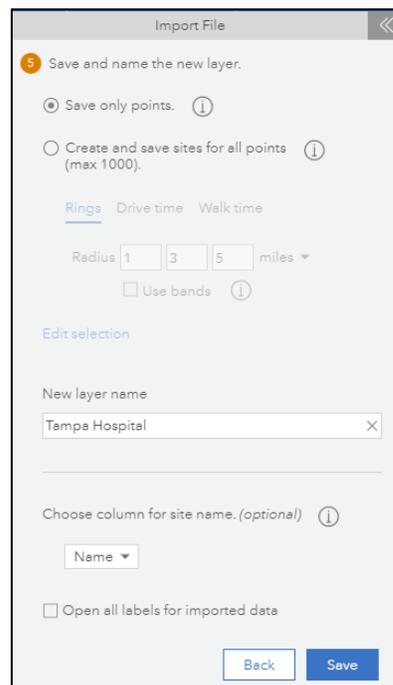
- Now, BA Web needs to confirm that all of the data fields it needs to plot the hospital locations on the map (address, city, state, zip code) are available in the data file you are importing. Indeed, those fields are in your hospital data file, so you can simply click Next again.

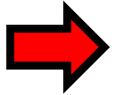


5. Next, we have the opportunity to set the style of the hospital symbols. In the example below, I used a medical symbol and colored it red, but you are free to select a symbol of your choice that will stand out well on the map. Before you click Next, make sure the “Cluster points” check box is left UNCHECKED.



6. Lastly, you can save and name the new layer so it can be used again in other maps. Set this dialogue box as you see it below. Click on Save and watch BA Web draw the hospital locations on your Carriage Pointe area map.





7. **Map Save Step:** Save this hospital location plus drive times map in your rough notes document. Place the map code “task3step7” with this map in your rough notes.

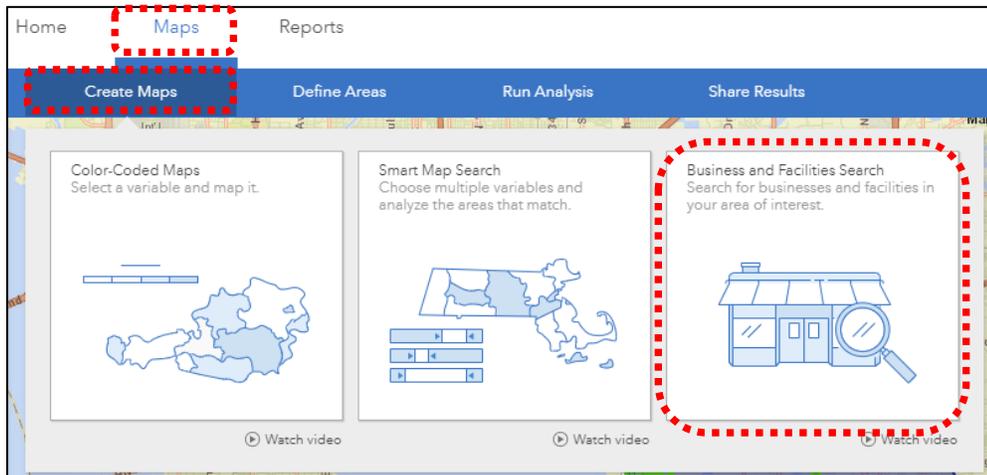


8. **Rough Notes Step:** With the hospital locations now represented on your map, what do you observe? How long a travel time is the closest hospital to the Carriage Pointe development? How convenient overall is access to hospital services from Carriage Pointe? What does this map indicate to us about how plentiful the healthcare options are around the Carriage Pointe neighborhood? Use no more than two paragraphs to provide this discussion.

### Task 4: Adding Community Services from BA Web’s Own Databases

Now we will complete a similar analysis, but with an important change. With the hospital map in place, let’s now add the other facility-based indicator of community wellbeing: Publix grocery store locations. Also, to add to our GIS learning, rather than loading Publix store locations from an address file, we will make use of BA Web’s own built-in database capabilities.

1. To start, go to the menu option Maps > Create Maps> Business and Facilities Search.



2. This will bring up the dialogue box below. Type “Publix” in the search box and click Go.



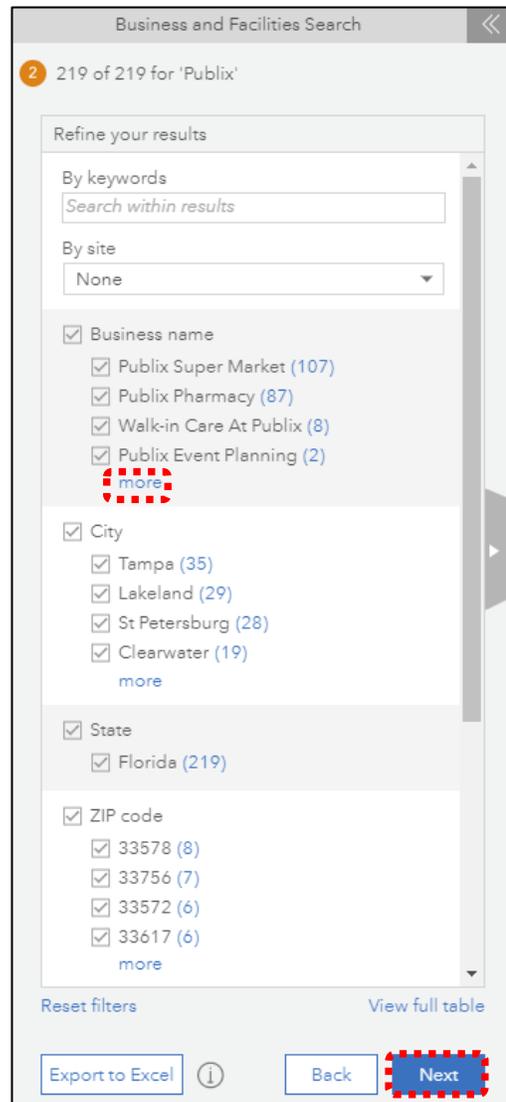
3. At this point BA Web presents you with a lot of information and options. The first thing you will see is the left-side dialogue bar on your screen has become quite full.

The BA Web databases have rich data for a business like Publix. The interface here shows that we can filter this database in many ways.

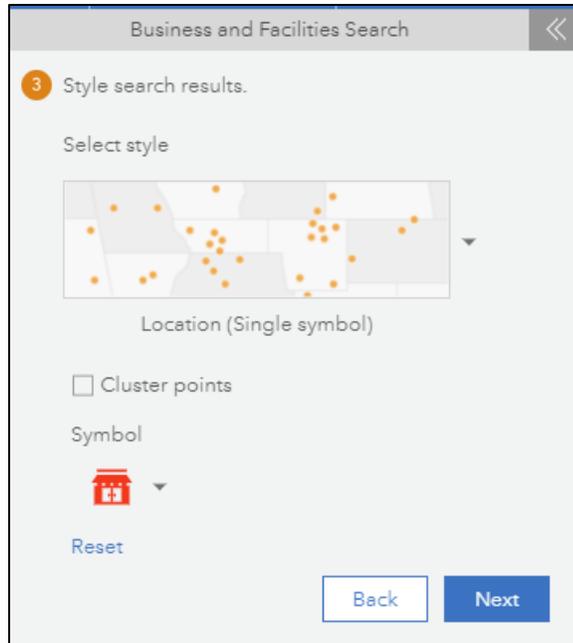
The most obvious thing we can do is indicate that we are simply interested in Publix grocery stores, and not the other related services (like pharmacy, walk-in case, etc.). Those other services are almost certainly also located in a Publix grocery store building (so including those other services would be in effect double-counting if we treated them as separate businesses in the analysis).

So under “Business name”, click on more (highlighted in red at right) and UNCHECK all of the “Business name” options EXCEPT for “Publix Super Market”. This will leave us with only the core grocery stores on our map and not include the other services Publix offers. It is this core super market/grocery store map that is our true interest here.

With this step done, click Next.

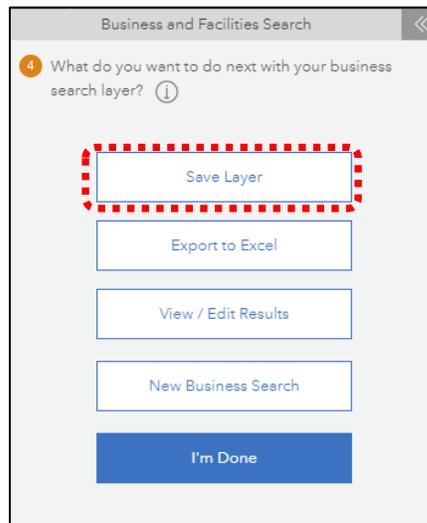


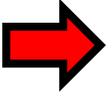
- The next dialogue box gives us the opportunity to change the look of the symbol BA Web uses to represent the Publix locations. You probably want to find a color and symbol (maybe something that looks like a grocery store?) that stands out clearly on your map. Also, ensure that the “Cluster points” check box is left UNCHECKED.



With this done, click Next.

- The last step in this mapping process is to tell BA Web what you want to do with the data you just extracted. For future flexibility in case you need to come back to this step, saving the layer is always a good choice.





6. **Map Save Step:** Save this Publix grocery store location plus drive times map in your rough notes document. Place the map code “task4step6” with this map in your rough notes.
  7. **Rough Notes Step:** With the Publix locations on your map, what do you observe? How many Publix stores are there within the 5, 10, and 15-minute drive time zones for the Carriage Pointe development? How convenient overall is access to food from Carriage Pointe? What does this map tell us about how plentiful the shopping options are around the Carriage Pointe neighborhood? Use no more than two paragraphs to provide this discussion.
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## Putting it All Together: The Final Report

The final report for each exercise must include the following components (please label each of the following five sections in your final report with a clear and prominent heading):

1. **Scenario:** a summary of the scenario situation, including your role, your geographic location in the scenario, and what is happening in that place
2. **Question:** the key issue within the overall situation that needs to be solved or addressed
3. **Analysis:** the GIS activities you used to complete the exercise
4. **Results:** what you found out (insights obtained)
5. **Application:** what good does it do for you to have done this work (how your employer can use what you found)

Remember that this report should be no longer than 4 pages (but this 4 page limit is for text only, and does not include maps). As you prepare to write this final report, review the steps you took for each analysis and all of your rough notes. As you prepare to write the application section of your final report, consider the following:

- Take time to carefully examine all of the information you have assembled in the preceding steps. Recall the scenario you started with, the question or problem you were addressing, the GIS activities you completed, and the observations you have made. Now is the time when you must explain all of this information in a concise, clear document.
- Summarize the overall picture you are seeing with regard to Carriage Pointe and the community’s local service infrastructure: what do you see, what do you think it means, and what might you recommend to avoid problems like Carriage Pointe has faced in other developments in the future? You are reviewing what you have provided in the previous parts and steps, so there won't be any new findings here. However, how you put it all together won't be a simple repeat of what you've already said:

- Like a courtroom lawyer, build your case and convince the reader with a clear and persuasive summary and assessment of your complete set of findings.

### To Submit this Group GIS Exercise:

1. Ensure all of your rough note question responses (for all steps highlighted in bold) are typed into a single Word document named "**Exercise-RoughNotes.docx**". Please place your responses in order (by task and step number) within this file. Each question response should begin with a heading giving the task and step number to which the response refers (e.g. "Task 1, Step 1a").
2. Collect all of the map files requested in this assignment (from the steps where you were asked to save a file, and you were given a file name to save under).
3. Complete your final report and save in a single Word document named "**Exercise-FinalReport.docx**".
4. Attach all of the above material (your rough notes file, your map files, and your final report file) to a single e-mail to be sent to my email address ([murray.rice@unt.edu](mailto:murray.rice@unt.edu)). Please make the e-mail subject line "Last Names of People in Group – GEOG 3100 Exercise" (e.g. "**Anderson Jones Smith – GEOG 3100 Exercise**").