

UNIVERSITY OF NORTH TEXAS
Department of Geography

GEOG 4220/5220: Applied Retail Geography

GIS Lab, Part 2: Advanced GIS Location and Market Assessment

In this second part of your applied assignment, we will use advanced GIS analysis capabilities from the *BA Web* software package to provide site and market insights for restaurant location planning at a broader, regional level. The instructions below pick up where Part 1 of the assignment left off (Task 5), so the analysis in Part 2 begins with Task 6.

The scenario: you are continuing in your job as market analyst for *Pei Wei Asian Diner*. Your assignment now is to analyze *Pei Wei* restaurant network in the entire Dallas-Fort Worth region and compare this network with the restaurant network of *Chipotle Mexican Grill* in particular. Recent survey and focus group research that *Pei Wei* has done has indicated that Chipotle is a particularly important competitor for *Pei Wei* in North Texas.

As noted earlier, *Chipotle* is not a direct competitor for *Pei Wei* (their menu is considerably different from *Pei Wei*), but *Pei Wei* competitor analysis indicates that both chains compete within the national casual dining sector and appeal to very similar market types. Your objective in this regional analysis is to draw insights from a GIS assessment of *Pei Wei* current regional operations and *Chipotle's* competitor locations that could help *Pei Wei* formulate locational strategies to guide its next best moves in North Texas.

As in Applied Assignment Part 1, please provide “**rough note**” results or answers (using complete sentences) or other material (maps, graphics) for **anything highlighted as a “rough notes step”**. Also, please label each of these responses using the task and step number associated with the bolded question you are answering – e.g. “Task 1, Step 1a”. Many steps do not require a written response, but you still might need to save a map or report produced in some steps. Also, please note that most steps do not require that you record anything at all, although you will still need to complete every step in order to complete the exercise.

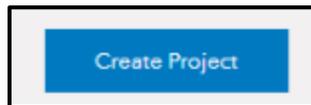
For this second phase of the project, we will again be using the Esri *Business Analyst Web* software to provide GIS analytical support.

Assignment Credit: Dr. Murray Rice created part 2 of this applied assignment using the *Business Analyst Web* GIS package and its associated data resources.

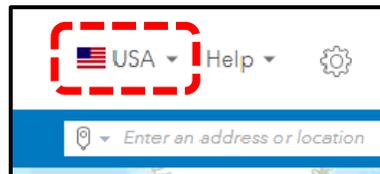
Task 5: General Restaurant Market Orientation in D-FW

You will begin your search by creating a project to contain your new maps and analysis. Then you will create a map to look at Dallas-Fort Worth, classified by dining out spending potential. You will also build current restaurant location information into your analysis. Lastly, you will analyze a combination of variables to help you highlight high-potential zones for new *Pei Wei* restaurants. Before you begin the following make sure you have logged in to *BA Web* and are ready to create a new project.

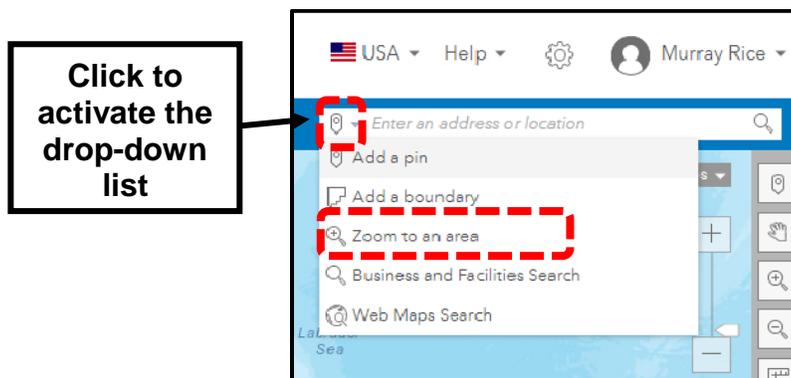
1. In *BA Web*, create a new project using the “Create Project” button that appears after you log in. Use the project name “DFW Dining Part 2”.



2. Open the newly created project, and close the Project Manager pane at left. After the project is opened, you can begin your market analysis.
3. At the top right of the page, verify once again that the country dataset used is USA.

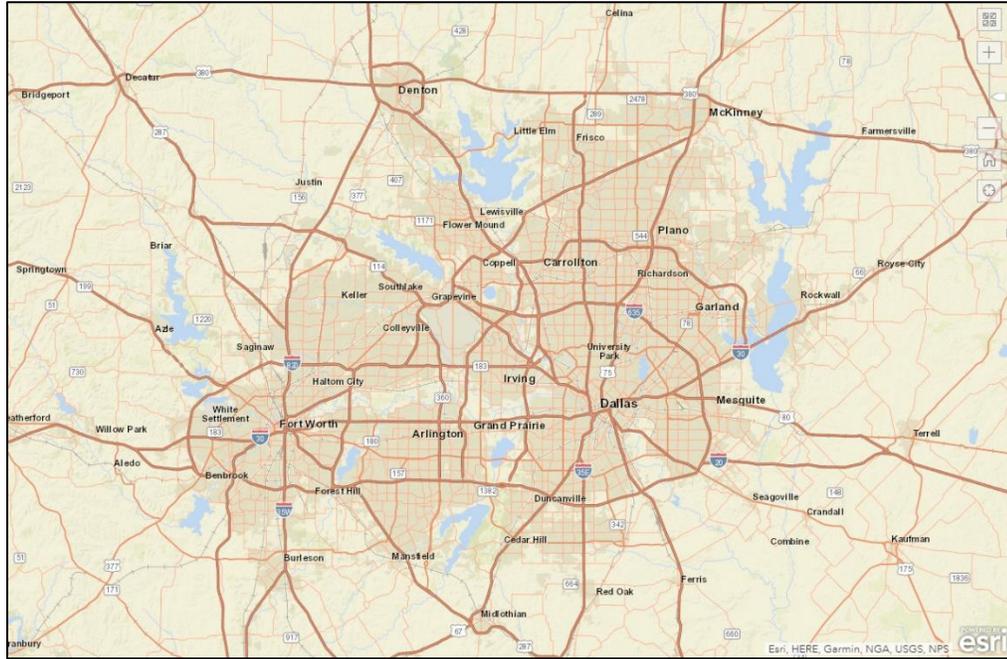


4. In the search field at the top right, verify that “Zoom To An Area” is the search option selected in the drop-down list. Type “Dallas, TX” and press Enter.



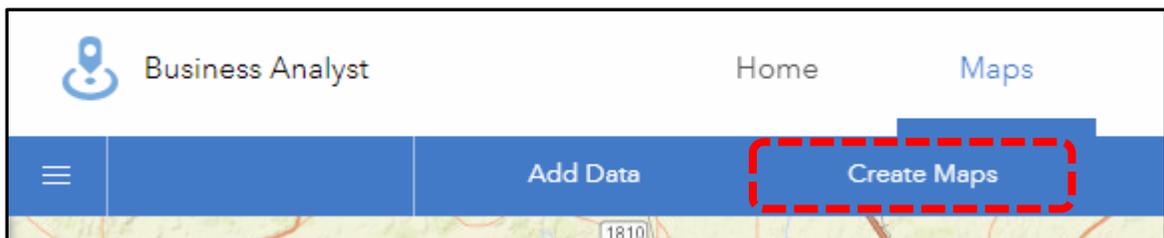
This search displays the city of Dallas.

5. Pan out a little and recenter your map so the entire Dallas-Fort Worth Metroplex area is shown, something like the below (you do not need an exact match on your screen; the important thing is to display a map that covers the approximate area represented below).

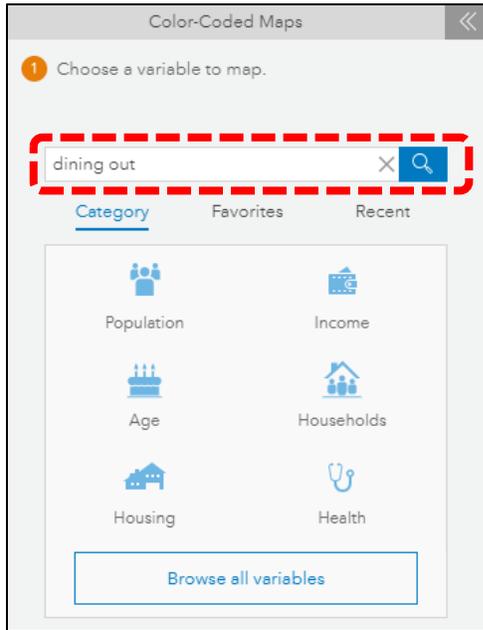


You now have a base map you can use to evaluate the potential for restaurant development across the Dallas-Fort Worth area.

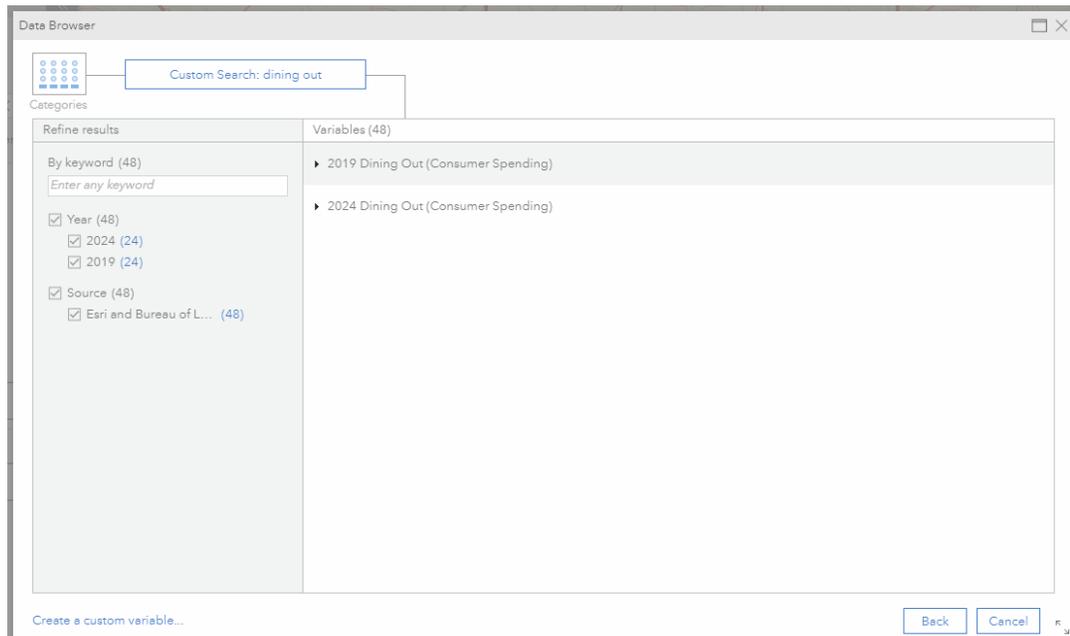
6. Now at the top of your BA Web screen, on the “Maps” tab, click “Create Maps” and then choose the “Color-Coded Maps” option that appears after that.



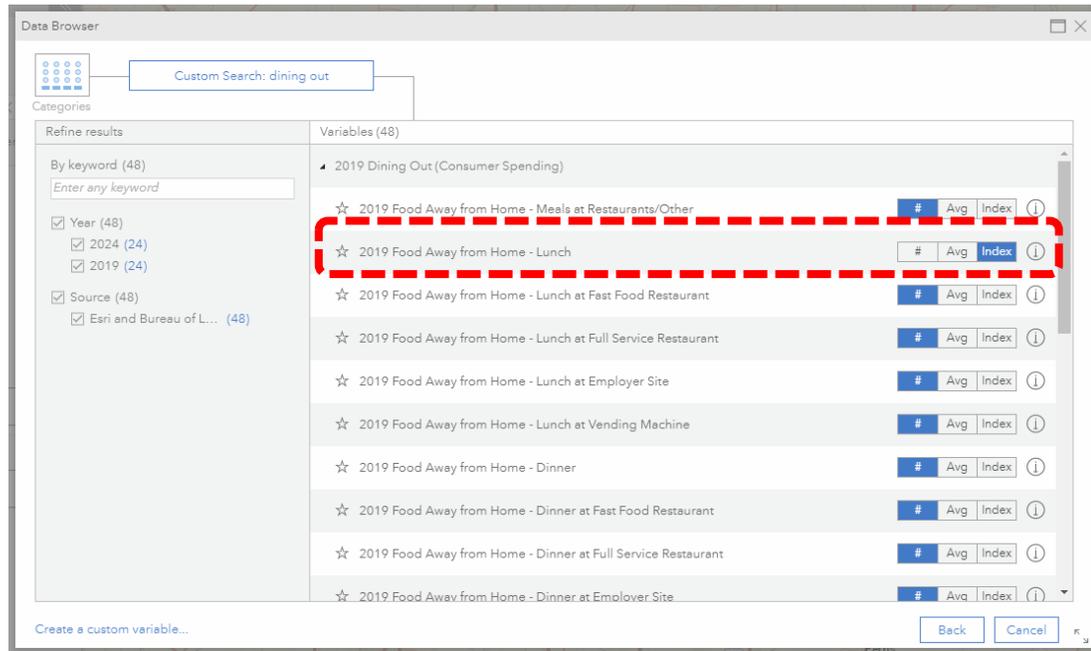
7. You want your D-FW map to show dining out potential. In the search field of the Color-Coded Maps pane on the left, type “dining out”.



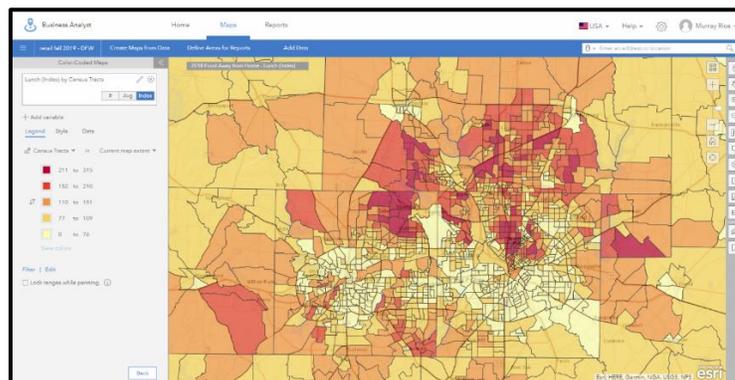
8. A “data browser” guide comes up with the available data fields that match your search terms most closely.
- a. The display provides an initial, simple grid of variable options for the current year and the current year plus 5 years. Select the current year set of variables.



- b. This will give you a more detailed list of variables to select from. From the available options, the “Food Away from Home – Lunch” fits your Pei Wei project needs most closely. Select “Index” (far right of line) and click on the data field name to proceed (*BA Web* will start drawing a map of this variable theme as soon as you click on the variable label).



9. **Rough Notes Step:** You can pan and zoom the map as you like. When you are happy with the map, save it as a JPG file (filename “task5step9.jpg”). Yours should look something like the one shown below (yours might not be exactly the same as this, and it does not need to be).

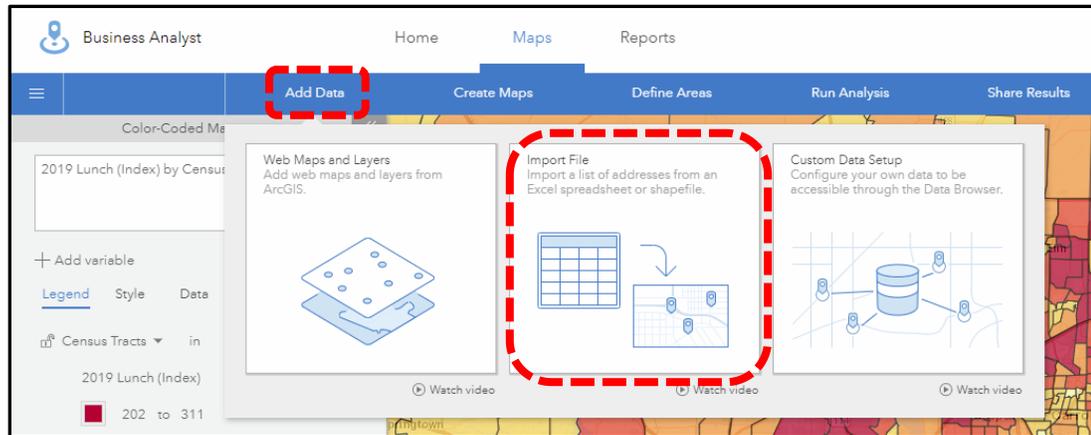


Describe the map pattern you see of “Food Away from Home – Lunch” index values. In a general sense, across the D-FW metroplex, where are the highest locations of “Food Away from Home – Lunch” index values? Where are the lowest values? Use a few place names for orientation, and limit your discussion to 3 to 5 sentences.

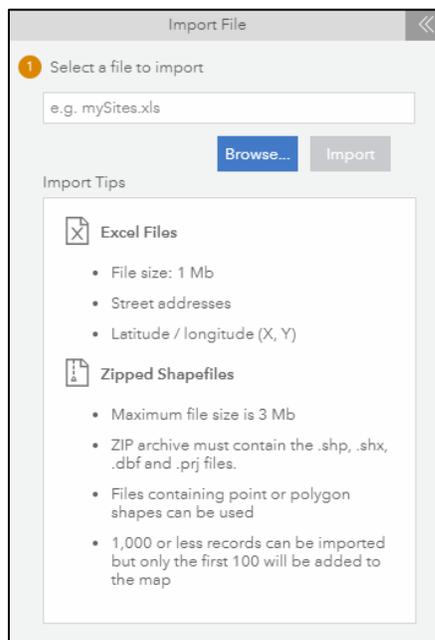
Task 6: Adding Restaurant Sites to the Analysis

Your next step is to add current restaurant sites to the analysis to visualize the extent of service currently provided by *Pei Wei* and *Chipotle* to provide additional analytical context.

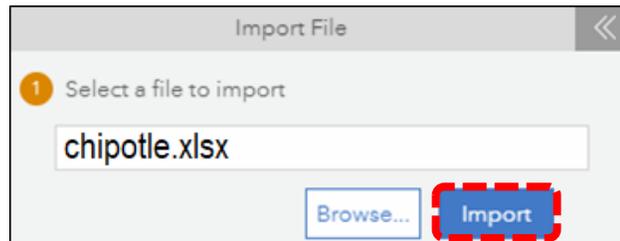
1. With your current “Food Away from Home – Lunch” theme still displayed, move to incorporate restaurant locations by clicking on “Add Data” and “Import File”.



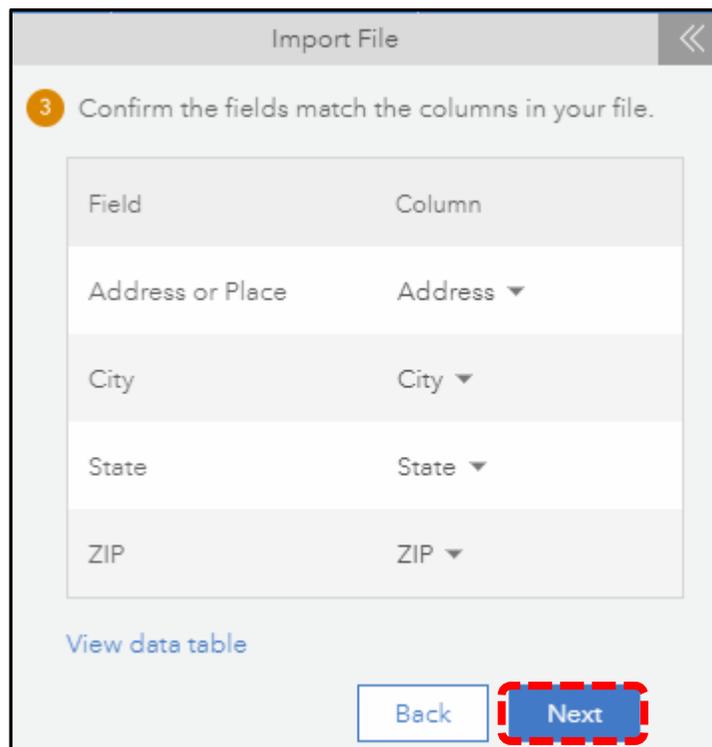
2. The import file dialogue gives you the option to import either an Excel file of address data for *BA Web* to map, or a Shapefile that contains location data that has already been mapped. We have restaurant address data for *BA Web* to map, so click “Browse...” here to search for your Excel data files.



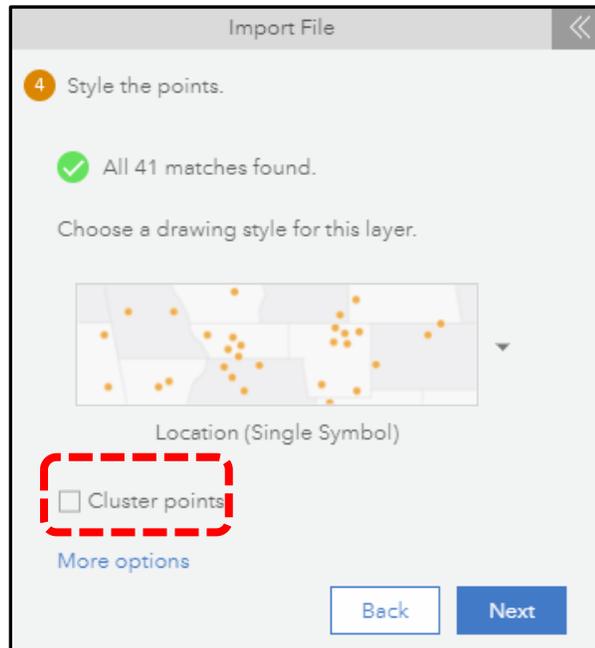
3. On your CSAM computer, you will find the Excel Pei Wei address file you need in the “Class” drive, “4220” / “AA2” subdirectory. Clicking on the “chipotle.xlsx” file will place the file in your import dialogue ready to upload. Click on “Import” to read this location data into BA Web.



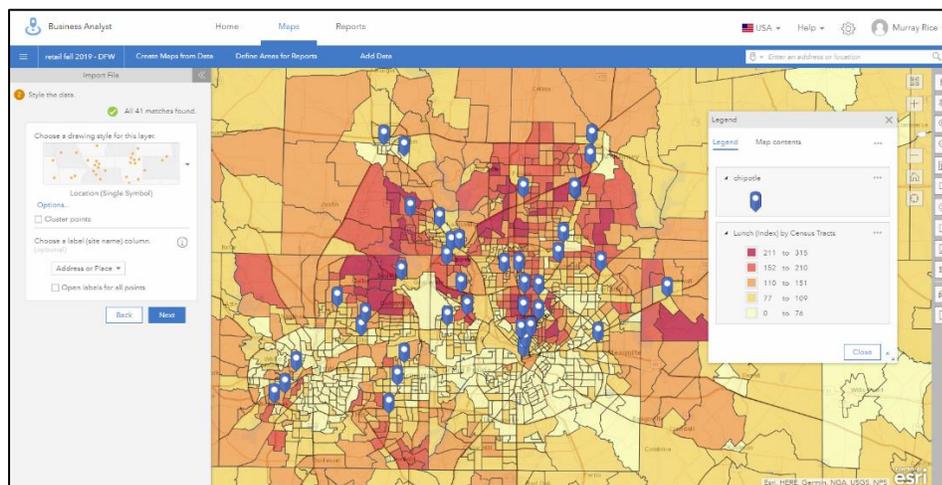
4. BA Web will then give you the opportunity to confirm
 - a. The type of data being imported (point data, versus geographic boundaries). This file is point location data, so select that option and click “Next”.
 - b. After that, *BA Web* will ask you to confirm the input data fields needed for mapping (Address, City, etc.). You should see *BA Web* make the following choices below, which are correct. If these are all set, you can click “Next” again.



- This will result in the display of a new D-FW map, but before you examine it, take time to un-check the “Cluster points” option so every restaurant location is represented by a locator symbol (make sure there is no check mark in this box).



- Rough Notes Step:** Your map should now look something like the one shown below (yours might not look exactly the same as this, and it does not need to be). Save the Chipotle map as a JPG file (filename “task6step6.jpg”).



- Rough Notes Step:** Comment on the relationship between the geographic distribution of Chipotle locations (point symbol theme) and the distribution of “Food Away from Home – Lunch” spending (area color theme). Use 3-5 sentences.

8. **Rough Notes Step:** Repeat steps 1 to 7 for the Pei Wei restaurant address file. You will need to click the “Back” button in the Import dialogue a few times, which will remove the Chipotle locations from your map (so be sure to save an image of your Chipotle map before you do this). When you have completed the new Pei Wei map, save it as “task6step8.jpg”.
- a. Comment on the relationship between the geographic distribution of Chipotle locations and the distribution of “Food Away from Home – Lunch” spending.
 - b. How similar and how different are the Pei Wei and Chipotle restaurant networks from each other?
 - c. Note one specific comparison: how many Pei Wei locations are there in Denton, versus how many Chipotle locations?

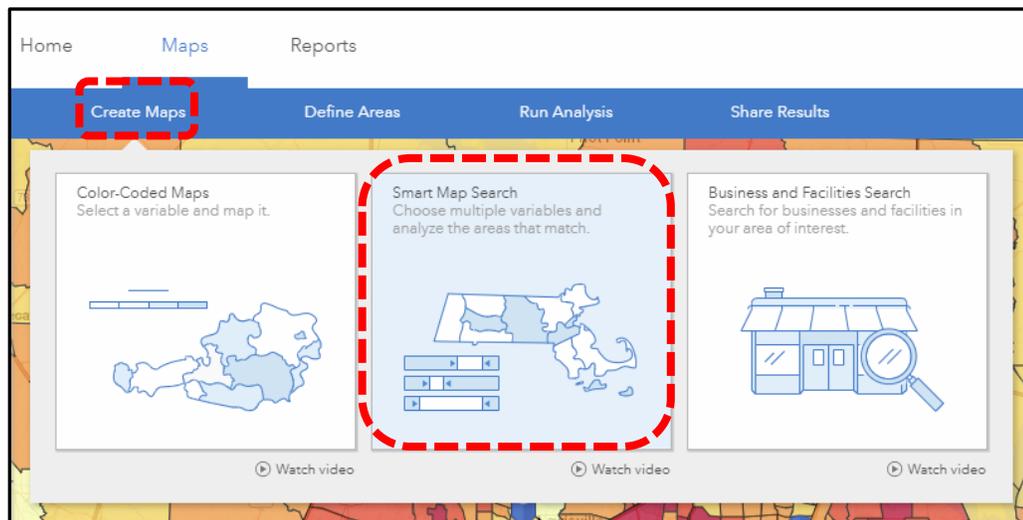
Task 7: Adding Multiple Market Variables to the Analysis

Your next step is to add two additional market variables to your maps to refine your view of the D-FW restaurant market for Pei Wei expansion. Pei Wei's market research has led senior management to target a specific age and income demographic for their future restaurant expansion.

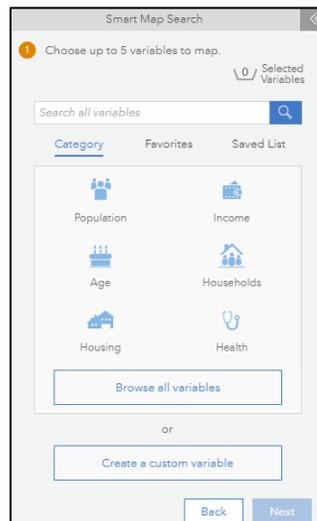
- A. *Age target:* 30-40 years of age
- B. *Income target:* \$50,000 to \$74,999 annual income

The steps in this task show how *BA Web* can help to geographically identify the D-FW markets that best fit these or other criteria.

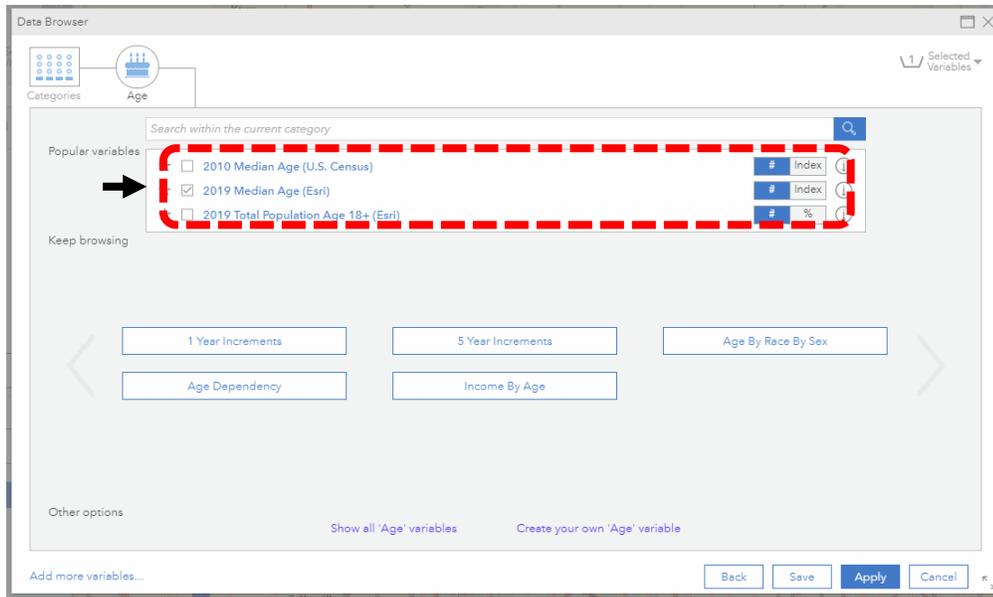
1. From the Maps tab, click Create Maps from Data, then click Smart Map Search.



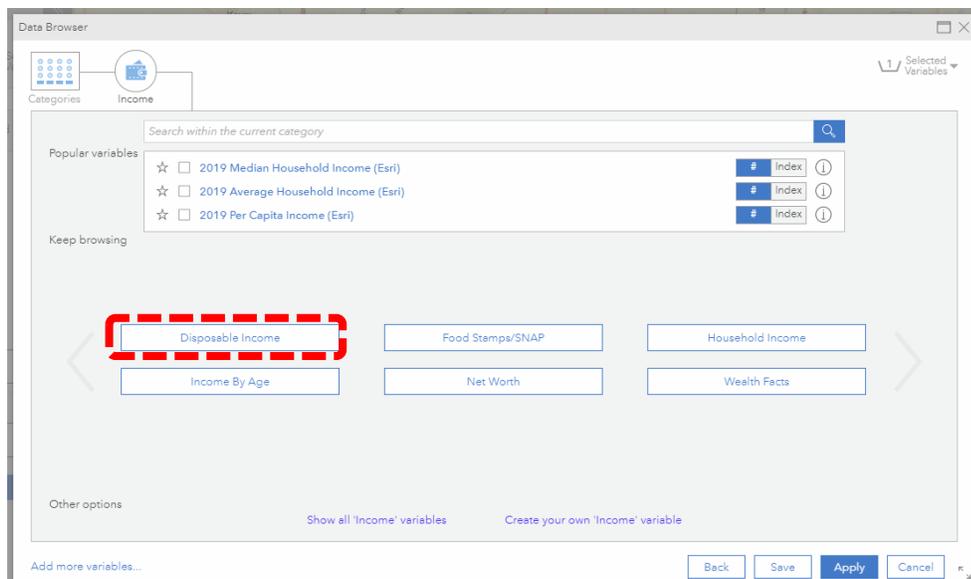
2. Smart Map Search gives us the ability to use up to five variables in a target market analysis.



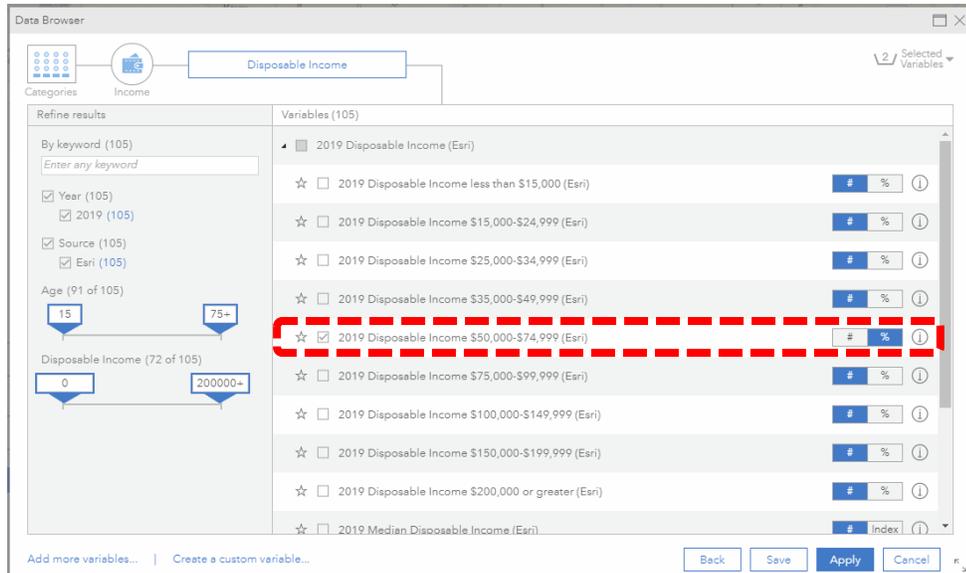
- Click on the “Age” Category icon (shown in the step 2 “Smart Map Search” graphic at the bottom of the previous page) and click on “2019 Median Age (Esri)” in the “Popular Variables” box. This will add median age as the first target variable to the analysis.



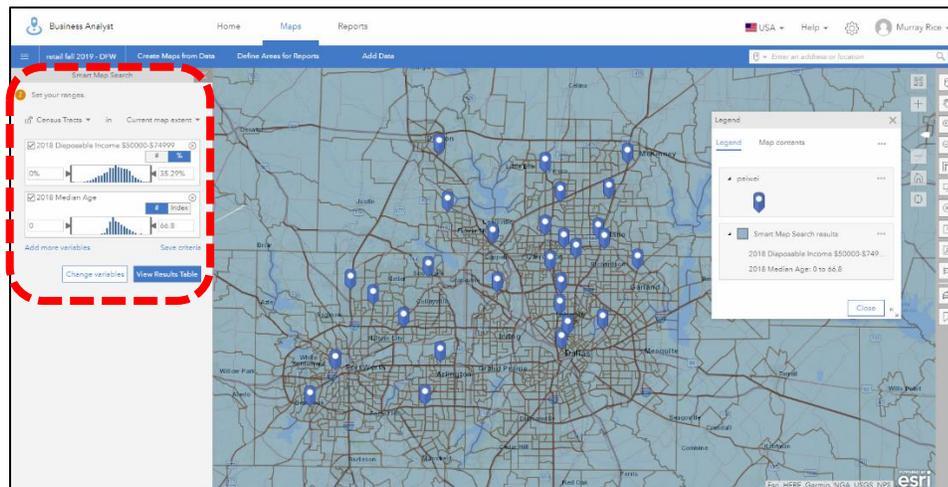
- Click on the “Back” button to display the full range of data categories again. Now, select the Income category for variable selection, which will give this dialogue. However, rather than selecting from the three highlighted variables in the “Popular Variables” space, we will choose to find what other choices are available under “Disposable Income”:



- Searching under disposable income gives us this dialogue of additional variables to consider. Click on the “2019 Disposable Income (Esri)” category, which will result in a new list of disposable income range variables appearing. From this detailed income list, select “2019 Disposable Income \$50,000 to \$74,999 (Esri)” and click the “%” tab for this variable, as shown below:



- With these two variables selected (an age variable, and an income variable), click on “apply”, which will give us a new and extremely powerful map tool:

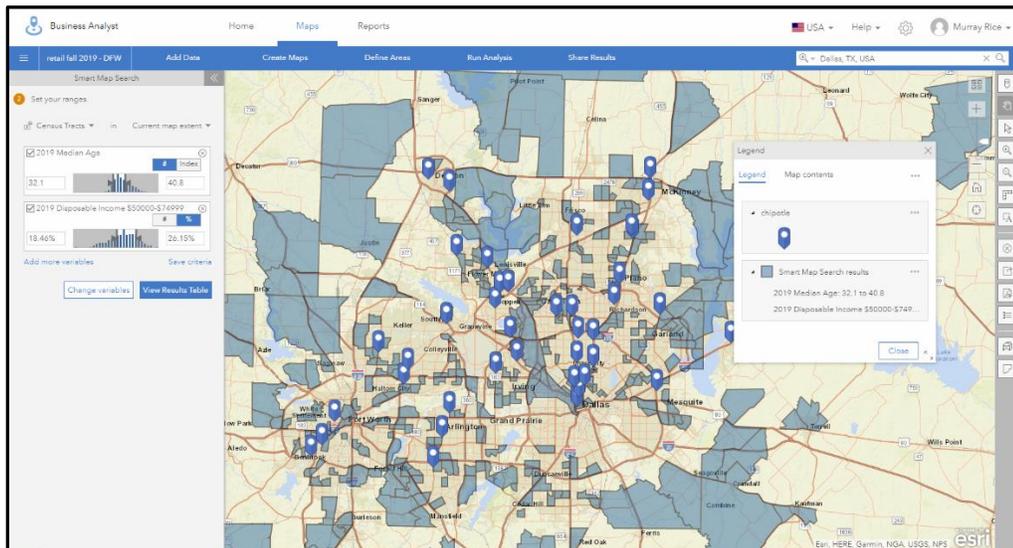


Every census tract on this map is currently selected (highlighted in light blue), as the map selection criteria start with a broad range: no census tract is omitted. However, use of the slider variables in the “median age” and “disposable income” boxes (“Smart Map Search”, the part of the screen outlined in red at left) gives us the capability of narrowing our selection criteria for each variable so only the most suitable census tracts remain.

7. Try playing with this capability: try dragging the data limits in the median age data graph to narrow the range of census tracts highlighted on the map. Do the same, playing with the data limits in the disposable income data graph. Get a sense of what this filtering capability does to the map as you adjust your limits.

8. When you have a good idea of how this capability operates, try setting the following data limits:
 - A. *Median Age (#)*: 32 to 40 (or as close as you can move the sliders to these values)
 - B. *Disposable Income (%)*: 18 to 26% (or again, as close as you can move the sliders to these values)

You should have a map now that looks something like the below:



9. Rough Notes Step: Save the target market map as it stands now as a JPG file (filename “task7step9.jpg”). Comment on the map as you see it here:
 - What does this map mean in a general sense?
 - What is the significance of the census tracts you see selected? (recall that these fit the given age and income criteria)
 - What meaning is added to the map by placing the Pei Wei locations on this same map with the census tract selection? How does each location relate to the census tracts displayed around it?

Take 2-3 sentences to address each of these three sub-questions.

Putting It All Together: The GIS Lab Final Report (Covering Parts 1 and 2)

Now is the time to make sense of the evidence you have assembled so far for the entire GIS Lab (including work completed in both part 1 and part 2). Remember that the “Common Features of Applied Assignments in GEOG 4220/5220” document specifies that your final report needs to include the following components (please label each clearly as sections in your report):

1. Exercise scenario
2. Question to be solved
3. Analytical approaches used
4. Results obtained
5. Application

As you prepare to write this report, review the steps you took for each analysis and all of your rough notes. Consider the following as you prepare to write the application section of your final report:

1. Take time to carefully examine the entire set of evidence you gathered from both part 1 and part 2 of this applied assignment: your pre-analysis reflections (task 1), field observations (tasks 2 and 3), and your GIS analysis (tasks 4, 5, 6, and 7). Make note of the major products you produced in each section (maps and reports), as well as your observations (answers to all questions in all tasks 1-7).
2. Your “results obtained” discussion should summarize the most important findings of all that you have uncovered throughout tasks 1-7.
3. Your “application” discussion should provide your bottom-line recommendation: which factors and evidence are most important from tasks 1-7, what does this collective evidence tell you, and how does that take you to a recommendation as to what locational strategy Pei Wei should be pursuing in Denton and the overall D-FW market?

To Submit this GIS Lab Final Report:

1. Ensure all of your rough note question responses (for all steps highlighted in bold) are typed into a single Word document named "*Part2-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 5, Step 9").
2. Collect all of the map attachments requested in this part of the 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 "*Part2-FinalReport.docx*".
4. Attach all of the above material (your questions responses, your map and report attachments) to a single e-mail to be sent to my special assignment submission email address (rice@unt.edu). Please make the e-mail subject line "Your last name – Part 2" (e.g. "**Smith – Part 2**").