

BUSINESS GIS CASE STUDY

TITLE: TRANSPORTATION OF SUPPLIERS AND OF CUSTOMERS TO STARBUCKS IN THE CITY SAN FRANCISCO

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NOTES:

1. This case study has a lab component.
2. Software requirements: Esri's ArcGIS Online and Business Analyst Online
3. Adopted in: BUSB 433 GIS FOR BUSINESS (core course in *Bachelor of Science in Business (BSB) program*)
4. Approx. 2,100 words excluding figures, tables, references.
5. Data for this case study may be requested by emailing gisab@redlands.edu.
6. **Keywords:** location analytics, transportation, proximity, drive time analysis, tapestry segmentation
7. **If you are a member of the academic community outside the University of Redlands and are interested in adopting this case, please email the author directly to seek permission.**

OBJECTIVES:

1. Perform an analysis of transportation proximity of suppliers and location distances of customers from Starbucks location in the City of San Francisco.
2. Gain understanding of how GIS can be used to enhance the analysis of determining transportation proximity of suppliers and location distances of customers from Starbucks locations in SF.
3. For some courses, at the instructor's discretion, discuss the problems and get feedback from other students on the work being performed through being a member of small teams of 2 or 3 students.
4. Answer essay questions at the end regarding (a) justifying the selection of the supply depot, (b) deciding which Starbucks locations would best serve targeted customers and why, and (c) determine who at Starbucks would benefit, what are the most important ideas coming from the exercise, and which map(s) has (have) the most impact?

BACKGROUND:

In this lab you will consider and analyze (1) drive times from the supply depots to Starbucks in the City of San Francisco and (2) distance from the ten Starbucks in the City of San Francisco to Laptops and Latte Tapestry areas in the City.

The drive time analysis can be useful to the manager responsible for the Starbucks in San Francisco City, as well as to individual store managers. Drive times are a good measure to use in business when reducing the time for land transport that carries people or materials for the benefit to the business. Consider whether there are situations when transport time of people and materials does not provide benefit in a business.

The lab will further demonstrate the power of GIS for transportation analysis of supply, which focuses on transportation distances. For analyzing customer transportation, the drive times of a special target group will be analyzed using Esri's Tapestry. Tapestry is an example of a geo-segmentation, which refers to the process of characterizing a neighborhood by its average characteristics. Tapestry divides all U.S. neighborhoods into 66 different Tapestry segments, under names such as Top Rung, Suburban Splendor, Up and Coming Families, Boomburbs, Sophisticated Squires (this best characterizes Redlands), Laptops and Latte, Up and Coming Families, Prosperous Empty Nesters, Metropolitans, etc. All 66 Tapestry segments are explained in the Esri document titled "Tapestry Segmentation Reference Guide," located at www.esri.com/library/brochures/pdfs/tapestry-segmentation.pdf Take some time to read through the Tapestry document. This will allow you to better understand and better interpret what you see in a Tapestry map. When you look at a Tapestry map, the color choice of Tapestry map areas can help you to remember Tapestry segments. Consider if those colors are helpful to you in reading the map or not.

The next page gives Esri's description of the Laptops and Latte segment, which will be chosen as a target group for Starbucks in the City of San Francisco. In the description, please note that the Segment Code is a number assigned to each of the 66 Tapestry Segments. The Segment Name is the name given to one of the 66 segments. The LifeMode Summary group consists of 12 broader groups, each of which represents a life style/life stage. A U.S. map of the 12 LifeMode Summary groups (L1 through L12) is given on page 2 of the "Tapestry Segmentation Reference Guide" (see also Table 1 on page 13). The Urbanization Summary Group consists of a different set of 11 categories on the spectrum from Urban to Rural areas. Those categories (U1 through U11) appear on Page 18 of the "Tapestry Segmentation Reference Guide."

EXAMPLE OF A TAPESTRY SEGMENT

Segment Code.....08
Segment NameLaptops and Lattes
LifeMode Summary GroupL4 Solo Acts
Urbanization Summary GroupU1 Principal Urban Centers I



Demographic

With no home ownership or child-rearing responsibilities, residents of Laptops and Lattes neighborhoods enjoy single life in the big city. Most households are singles who live alone or with a roommate. The average household size remains constant at 1.8. Although this segment is slowly increasing, it is maturing and diversifying more quickly. The median age is 38.7 years. Although most of the population is white, Asians represent 10.4 percent of the total population.

Socioeconomic

This segment is affluent; the median household income of \$93,899 supports these residents. The median net worth is \$285,718. Laptops and Lattes residents are highly educated. More than 70 percent of residents aged 25 years and older hold a bachelor's or graduate degree; approximately 90 percent have attended college. The percentage enrolled in college or graduate school is more than three times the national level. Two-thirds of the employed residents work in professional or management positions, especially in the scientific, technical, finance, insurance, educational services, health care, and information industry sectors. More than half receive investment income; 19 percent earn self-employment income.

Residential

Laptops and Lattes residents prefer to live in major metropolitan areas such as New York City, Los Angeles, San Francisco, Boston, and Chicago. They are more likely to rent than own their homes; home ownership is at 39 percent. The majority of housing is apartments in multiunit buildings, especially those with 20 or more units. These neighborhoods are older and virtually untouched by urban renewal. Although 38 percent of the housing units were built before 1940, they are not inexpensive. The average gross rent is 85 percent higher than the US level, third highest of the Tapestry segments. The median home value is \$634,295, second only to Top Rung. Thirty percent do not own a vehicle.

Preferences

Cosmopolitan, connected, and politically liberal, Laptops and Lattes residents rely on their web-enabled cell phones instead of laptops to communicate. After the college segments, this is the top market to own an iPod and laptop or notebook computer. They go online to check e-mail, trade and track investments, review the latest news, arrange travel, and shop on sites such as amazon.com, ebay.com, and barnesandnoble.com. They also order items by phone. These residents travel, especially abroad, and enjoy a variety of vacations, such as backpacking, hiking, and beach trips. They stay at upscale hotels and rent cars when on vacation. A typical resident owns renter's insurance policies and uses dry cleaning services frequently.

Laptops and Lattes residents go to the movies, the theater, dance performances, rock concerts, museums, bars, nightclubs, baseball and football games, and professional basketball games. They watch foreign films or movie classics on DVD and news and music channels on cable TV. Saturday Night Live is a favorite program. They eat out frequently and take adult education classes. They shop at Target for essentials and luxuries at high-end department and home stores.

Residents exercise regularly at a health club and practice yoga, go downhill skiing, play tennis, jog, and bike. When they listen to the radio, they have a strong preference for classical music and all-news programs. They also listen to public radio and contribute to PBS. They read two or more daily newspapers; a variety of books such as history, biographies, and self-help; and travel, epicurean, airline, fashion, finance, and business magazines. They tend to buy organic and low fat/high fiber food. They eat nutrition/energy bars and take vitamins regularly. They get involved in community activities, write to elected officials, write articles that are published, and participate in environmental groups.

PROJECT:

The two key analyses for the Project are:

- (1) To understanding drive times between Starbucks store locations and supply depots
The drive times are important to different stakeholders within Starbucks, such as a driver, a Starbucks regional operations manager, or a supply depot manager. Please consider that these stakeholders may perceive and use the drive-time information in different ways.
- (2) To determine pedestrian walk times of targeted customers to Starbucks locations.
As you go through the exercise, consider why walk times for targeted customers in the city are important. Please note that the targeted customers and their reasons for knowing walk times may vary throughout the day and night; however, we will not be analyzing these diurnal patterns in this beginning exercise.

As you go along, save key maps by clicking on the Screenshot tool in the toolkit (it looks like a camera), clicking on Save, and saving the map image with a filename you assign to a folder on your computer.

Be sure to remember to do this, since you'll need to retrieve these maps to answer the essay questions.

STEPS:

To start off, you will analyze the drive times between SF City Starbucks and two possible supply depots

First, bring up BAO by accessing <http://bao.esri.com> and entering your Username and Password.

Next, download from the BUSB 433 Blackboard site the Excel file,

Starbucks_Locations_City_San_Francisco-11-17-11. The Excel file has the addresses of the ten Starbucks outlets within the City of SF, which were obtained from InsiderPages.com

<http://www.insiderpages.com/search/search?query=starbucks&location=San+Francisco%2C+CA&radius=0&order=best&commit=Submit>

Go to the InsiderPages.com site and examine how Starbucks addresses can be selected for San Francisco and other Cities. Also, to broaden your understanding of the InsiderPages website, try to obtain the six Starbucks locations inside the City of San Bernardino and request "View Larger Map" to see a map of those locations.

Why do you consider this InsiderPages website important? Think how you could test whether the InsiderPages information is up-to-date and accurate.

Uploading Starbucks Information from Excel

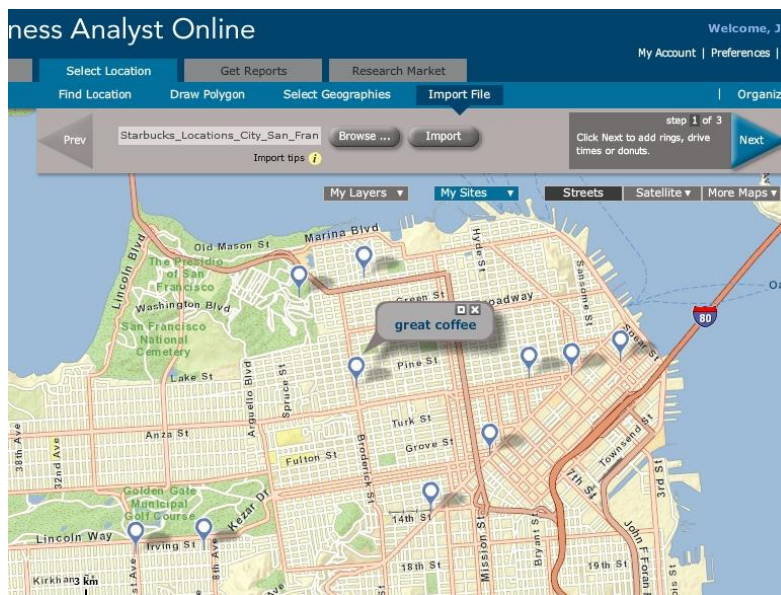
The Excel file has been prepared for you to use in this exercise. In the next step, you will use BAO to import the spreadsheet information into BAO. One imported, BAO will geocode those addresses into map points to be used in your analysis. (“Geocode” refers to conversion of an address into an X-Y coordinate point on a map).

Next you will “tell” BAO where the information it’s looking for is found on the spreadsheet.

In the Excel file, the Starbucks names under IDs were obtained from the user reviews on the San Francisco Starbucks sites.

Steps for Entering the Addresses for BAO to Convert to Points on the Map

In BAO, you now will load in the SF City Starbucks locations by clicking Find Location/Import File/Import/Browse. Go to the directory where you stored the Excel file and highlight the file and click “Open.” Then click “Import” in BAO. You can check that “Fields” correctly corresponds to the “Columns” in Excel. BAO also indicates “Select column for Site Name. (optional)” Select the column named ID. Then click again on “Import.” Click “Next” and make sure 10 locations were found. Select location symbol and click “Add Selected Locations.” Your map will look like this one:



The label for the Starbucks location named “great coffee” appears by clicking on the location symbol, in this case a pin symbol. You can click on any pin symbol to find its name and other information.

Supplier Study

You are now ready to study the transport times between the SF City Starbucks and two supply depots.

The Depots are located at the following places.

1. Storage near SF International Airport. If you use the Hand tool to look down the San Mateo Peninsula, on your map, you'll find the symbol for SF Airport just below the city of South San Francisco.
2. Storage in the City of Alameda. This is a port and storage area that is across the Bay Bridge and somewhat south of Oakland. It is marked on your map as "Alameda."

Here are the locations of the two storage depots



Locate the "Peaceful Environment" Starbucks. You will request Drive Times for this Starbucks by double clicking on the label for "Peaceful Environment" and clicking "Add rings, drive times or donuts." Select Drive Times and indicate Drive Times of 5, 10, and 20 minutes. Click Apply and Deselect all. Then select only the "Peaceful Environment" location by putting a check mark on it. Then click Apply. It will process for some time and then will give a map of the 5, 10, and 20 minute drive times for this one Starbucks.

Examine the 20 minute drive times between "Peaceful Environment" and (1) SF International Airport (use the airplane symbol) and (2) Alameda (use the middle of the word Alameda to mark it). Which do you think would be a better supply depot location for "Peaceful Environment Starbucks? Why?

Next, you will select 5, 10, and 20 minute drive times for all ten SF City Starbucks. Just repeat the process you have just done for one location, but this time Select All. This calculation will take longer since it's computing for 10 locations, but be patient.

Once you have all the drive times shown, you can look at the whole pattern or use the cursor to highlight individual Starbucks. In Essay Question 1, you will justify which supply depot, SF International Airport or Alameda is better overall as a supply location for the ten City of SF Starbucks. Remember to click on the camera icon in the Toolkit to save the screenshot of this map for use in Essay 1.

Please note that clicking on "Donuts" instead of "Drive Times" will give you a different map display. If you have time, click on "Donuts" to see this alternative display for drive times. What does "Donut" tell you that is different from "Drive Times"?

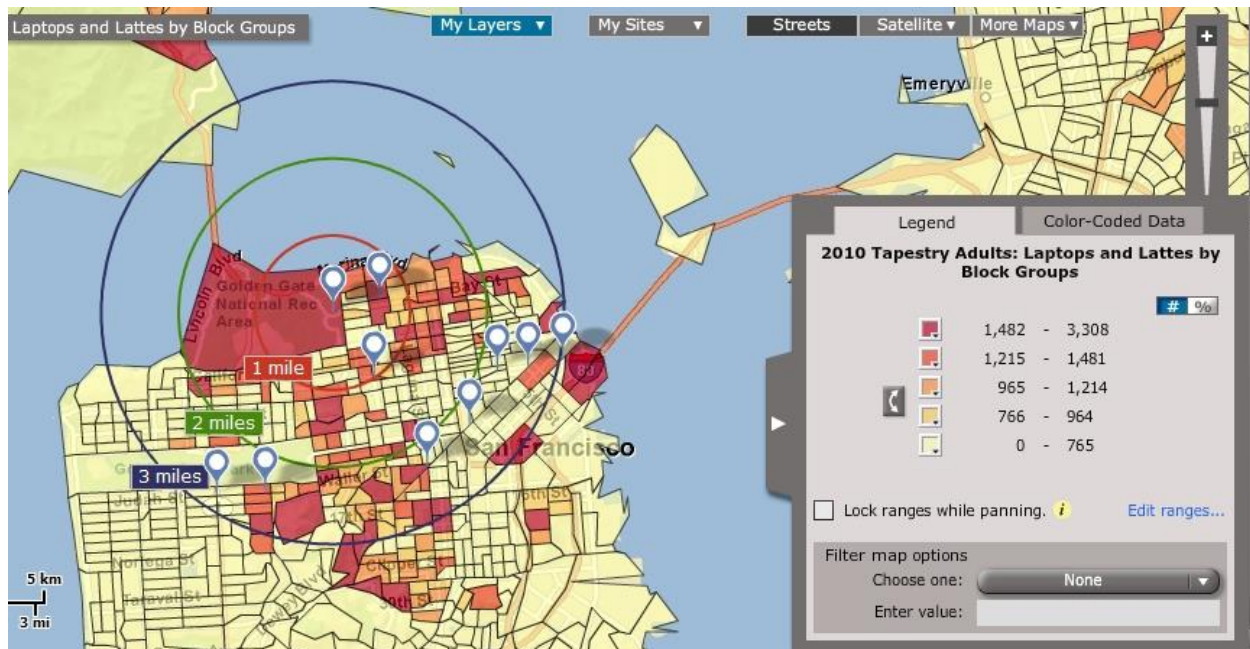
Tapestry Study

Eliminate the drive times and retain the 10 Starbucks locations. You may need to hit the Clear Map tool and re-load the Excel file or you can click on "my Sites," unclick all views, and close the window.

Request the Laptops and Lattes Tapestry locations by Clicking on Research Market/Create Color-Coded Map/Choose Variables. Go down on the pull-down screen to Tapestry Market Segmentation (Adults). Click on the + Sign to show all the Tapestry Segments and then Click on # symbol to give the Adult Population numbers for areas of Laptops and Lattes. Then double-click on Laptops and Lattes. The red to white color ramps shows the areas that have the highest number of adults meeting this Tapestry designation. Note: you can optionally adjust the ranges by clicking on "Edit Ranges." It is recommended you include five categories within the range.

Be sure to do a Screenshot of this map. You will use it in the Essay Question 2.

An example of a Tapestry map for Laptops and Lattes is given below, with 1, 2, and 3 mile circles for Great Coffee superimposed over it.



DELIVERABLES:

Answer the two following essay questions in one-half page answers along with supporting BAO maps and reports.

- 1) Justify why you have selected one of the two supply depots for the SF City Starbucks. In answering the question, consider the travel time distribution, and other information you might access about the transportation flows in and near the City of San Francisco. Also comment on street routing of supply from the depot you choose. Often supply routes can be made more efficient by careful routing to serve nearby locations quickly and efficiently. How can the supply be made more efficient, based on the location of the depot and the location of the 10 SF-City Starbucks?
- 2) Decide which one of the 10 SF City Starbucks locations would best serve the Adults who are classified as Laptops and Lattes. The access within the city will commonly be on foot (pedestrian), so that information is more useful than drive times. Drawing a circle around the location may better represent pedestrian access to a Starbucks location. Thus, to decide on the best Starbucks location, it is recommended to draw 1,2, and 3 mile circles around each of the 10 locations, and see how much of the Laptops and Lattes areas are included. Justify why you have chosen the location that best services the Laptops and Lattes profile population. Indicate why you think this Tapestry approach would be beneficial to determining access to Starbucks by SF City target populations. State what you think are weaknesses to the Tapestry approach.

- 3) Who in Starbucks do you think would benefit the most by seeing the results of the analysis? What are the 3 to 5 most important ideas coming out of the analyses in the exercise? Which map most strongly drives home the ideas of the exercise? Why?

Please e-mail your assignment to the instructor.

It does not have to be completed during the in-class lab session, but can be e-mailed to the instructor by the following Saturday.

Please be sure to put your name of the homework assignment.

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