

Geob 270 Final Project
Amazon Headquarters 2 - Location Suitability Analysis

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Abstract

The powerful multinational company Amazon, currently valued at \$5 billion, is in the midst of a search for a second headquarters (HQ2) in order to accommodate for their increasing sales and growing team. Amazon intends to create up to 50,000 new full-time jobs with salaries collectively exceeding one hundred thousand dollars (\$100,000) annually (Amazon, 2017). Cities are currently bidding on Amazon's next location as a request for development proposal (RFP), and the Vancouver Economic Commission officially submitted its bid on October 19 (Chan, 2017).

Vancouver has a regional economy which has shifted rapidly in the post-fordist era; moving from a key player in the resource sector, towards an economy fueled by service, and focused around attracting high-tech 'creative class' industry. We believe that due to these factors, Vancouver is an attractive location for this development. The purpose of our project is to provide a location suitability analysis for Amazon HQ2 in Vancouver. Our analysis is based on the suitability requirements published by Amazon in their Request For Proposal (RFP) package. Our analysis intends to highlight the given "zones" in Vancouver which would best accommodate this new development based on Amazon's requirements and further analysis, and then move to rank these areas accordingly. We will present arguments based on our spatial analysis for why we believe they should be ordered in this way, as well as why Vancouver is a possible site for Amazon's development.

Description of Project, Study Area, and Data

As described above, our project is focused around location suitability. Our map will include both the City of Richmond, and the City of Vancouver in taking Amazon's requirements into account, with a specific analytic focus on the Vancouver Downtown Core as well as Burnaby. Requirements for Amazon HQ2 are as follows:

- Metropolitan areas with a population of over 1 million
- A stable and business-friendly environment
- Urban or suburban locations with the potential to attract and retain strong technical talent
- Within 30 miles (48 km) of a population center
- Within 45 minutes to an international airport
- Proximity to major highways and arterial roads 1–3 miles (2–5 km)
- Direct access to mass transit routes such as rail, train, subway/metro, bus routes
- Initial 500,000+ square feet requirement
- Up to 8 million square feet (740,000 m²) of office space for future expansion

(Amazon, 2017; Amazon HQ2, 2017).

In order to understand ideal locations for Amazon's second headquarters, we acquired data pertaining to the above requirements from DataBC, the City of Vancouver, and from past labs. These include: landuse for Vancouver (lab), landuse for city of Burnaby (City of Burnaby), zoning districts (City of Vancouver), roads (lab), shoreline (lab), BC airport locations (DataBC), the locations of other technology companies similar to Amazon (DiyGenius) and transit (City of Vancouver & TA Peter Whitman).

Methodology of Analysis

Our methodology focused around first meeting Amazon's spatial requirements as described above. We used overlay analysis in order to be able to determine the spatial limitations to Amazon HQ2's development, or areas in which the development was not possible. From there, we came up with a number of areas or 'zones', which, based on the spatial requirements, we believe would be a suitable area for the development. Furthermore, we based the creation of the zones on how 'attractive' they would be to Amazon in terms of business climate, accessibility and as a location of power within the city. This overlay allowed us to further visualize spatial interactions between these features, and eventually rank the areas which we thought best fit Amazon's requirements and needs as a company.

In creating these zones however, we had to take into account knowledge of the city and the spatial interactions of features that were not obvious from looking at the map. Each area, while meeting the spatial requirements comes with a given history and path dependency which will have an effect on not only the attractiveness of the zone, but also will shape the projects development after being built. Physical space and character were especially influential factors in deciding our zones and their rankings. For example, while the initial requirement of 500,000sq/ft can be met in all zones, some areas offer easier expansion to Amazon's suggested 8 million (in this case, zone D and E). Along the same lines, some areas may be more easily able to be demolished and rebuilt or already have open space with which to build from scratch. Moreover, socio-spatial interactions also come into play. Some zones we identified, such as zone B and C come with the benefit of a thriving tech sector already established; zone C especially, as a hub for well-off millennials is an area of historical importance as well as a location of power within the economic landscape. This is contrasted by areas such as zone D and zone E, which have the benefit of increased space for expansion or initial development, but also are areas which are further from that established social environment/connectivity. Thus, our methodology also focuses around Amazon's perceived desires as a company, addressing what may seem more attractive to them in terms of social spaces, as well as economic geography and spatial needs.

The above questions and resulting methodology of analysis were all developed as the maps were created, and are addressed in the discussion section of this report. Thus, while the initial analysis was spatial, our methodology of analysis was expanded to necessarily include social factors as well. As GIS analysts, we must recognize that the decisions we make create power relations and have possible effects in the real world. Therefore, we must ask ourselves what the effect of developing an Amazon headquarters in a given area of the city would entail; not only for Amazon but for residents, businesses and institutions already located there. Thus for future investigation, we suggest how similar development projects in other cities impacted its urban economic geography in order to draw conclusions about how similar effects may be felt in Vancouver (ex. Gentrification, housing prices, etc.). That being said, coming from the perspective of a city trying to attract Amazon's business, the following analysis is wholeheartedly in support of the project and looks to the best, most attractive area for Amazon HQ2.

Discussion and Results

Vancouver is the ideal city to place Amazon's new headquarters. The city has a population of about 2.6 million people (Canada, 2017), fulfilling Amazon's first request. It has stable and business friendly environments along with urban and suburban locations with the potential to attract and retain strong technical talent such as Vancouver's Industrial zone and Burnaby. After overlaying all data layers we located five possible zones within the city for Amazon's second headquarter. All zones are within a population center, lay within 2 km to arterial roads and highways, have access to mass transit routes such as the skytrain and busses, and are located near other high tech businesses.

Zone A and Zone B are located farthest from the airport. Due to the limited space in these areas, it will be harder for Amazon to build their headquarters from scratch and would most likely look to occupying already existing office space. While Amazon is open to this, as noted earlier, the tech giant would most likely want a distinctive-looking design in order to define themselves architecturally and functionally in the city. However, the business climate and central location benefits that these zones provide outweighs the spatial limitations or costs available in this area. The attraction of both areas comes from the high concentration of high tech businesses, especially in Zone B. To produce hi-tech products it requires social interaction, networking and tacit knowledge that can only be obtained through interaction as seen in Silicon Valley. The geographical clustering and proximity of hi-tech businesses is beneficial for untraded interdependencies which is the informal economic interactions that do not go through a formal market as they emerge through networking and social interaction (Stroper, 2010). Between Zone A and B, Zone B would be a better place to locate the headquarters as it has a higher concentration of hi-tech businesses and is the most

diverse when it comes to zoning districts. Zone B has access to historical, government & institutions, and parks, which makes it an attractive location. Although, this can also become a drawback while looking for a place to build the headquarters.

Yaletown is the beating heart of the hightech sector of Vancouver. As a multinational operating in the high tech sector, Amazon, if decided to open its second headquarters in Vancouver, would be expected to be in Yaletown (Zone C). However, building a completely new building in Yaletown has its limitations such as the lack of space, as well as cost of housing. As it can be seen in our 'Downtown and False Creek Recommendations' map, there are a significant amount of historical buildings and parks, which unlike industrial land, are often protected. The rest of Yaletown is already full of skyscrapers that host both residential and office spaces. Hence, placing the headquarters in Yaletown would be the most expensive of all the zones proposed.

The fourth area we recommended for the second headquarters of Amazon lies in the semi-industrial areas of False Creek. Full of huge warehouses and manufacturing spaces, this area is expected to have significant amount of development and gentrification in the upcoming years. Already hosting high tech headquarters, our suggested area (labelled in our map as Zone D) is a cheaper option to build new headquarters while still being in close proximity to downtown area and Vancouver's International Airport. When compared to the three downtown locations, Zone D has the largest available area to build the new headquarters. The fact that the Zone D has a good amount of industrial land, reflects its potential to become a high tech hub since most areas that host a density of businesses that operate in the high tech sector initially attract the customers with the available industrial land (Barnes 2017). As a drawback, it could be stated that there are less high tech companies located in the area. However, as Amazon moves in, it will surely attract businesses in the tech and service sector to that area due to the increase in available capital.

The single possible location in Burnaby, at first, would seem less preferable since it is far from Vancouver, and all the other technology companies Vancouver hosts. However, this location would still provide Amazon with accessible bus routes and offers direct access to two major highways. This means although they may be farther from technology hubs, they would not be disconnected. As this is outside the downtown core, it would be cheaper to build a new headquarters for Amazon. Burnaby is also a growing hub for the high technology sector, so although it may seem sparse in terms of other business right now, in the upcoming years this may change drastically (Barnes 2017). Since this area is comparatively undeveloped, there is also opportunity for a more extensive complex for Amazon (such as the headquarters of EA Canada).

After analyzing the benefits and disadvantages of all the ideal zones proposed (Zone A-E), we conclude that the best zone for Amazon to place their headquarters within the city of Vancouver is the False Creek area, or Zone D. Zone D still fulfills all of Amazon's requirements and in addition has the space available for Amazon to design

and build their own headquarters if desired. Even though Zone D is not clustered with high tech businesses, it is still very close to the high tech hubs in Vancouver. Indeed, it is possible to travel to Yaletown, the high tech hub of Vancouver, by a very brief ferry ride. False Creek further holds the potential to become a high-tech hub itself. Moreover, we are convinced that being one of the largest internet retailers in the world, Amazon will speed up this process if it settles down in False Creek, since similar companies and supporting services will cluster around Amazon HQ2

The second best option we deem to be Yaletown (Zone C). The reason being it is one of the main hubs for high-tech businesses in Vancouver currently. Thus, Amazon would be settling in to a location already established and ready for growth. Assuming Amazon can afford it, it may be beneficial for Amazon to settle into the high cost environment because it could have long term benefits of an emerging tech sector. However, we did not select this location as number one option due to the historical zoning laws. This may cause socially unfavourable outcomes as these are highly valued in society for spiritual, cultural and recreational reasons.

Burnaby (Zone E) follows up as the third best zone to construct the new headquarters. Although this location seemingly presents abundant space and an opportunity for Amazon to attract and create a new technology hub, Burnaby is still in the early stages of development as a high-tech hub. Due to the timeline which Amazon is expecting for establishment and growth may not be preferable. In addition to this, its distance from many other requirements such as the airport and other high-tech companies may be more expensive in the long run, as least cost paths may be longer and costlier than paths in Vancouver. Finally, being farther from the already existing clusters of hi-tech businesses may hinder the untraded interdependencies.

Zones A and B we deem as least suitable compared to the others. Although they provide many networking opportunities and satisfy many of Amazon's requirements, there are extremely limited options for expansion. The business environment has also already been established. There may be less flexibility in changes to the business atmosphere in comparison to starting a new environment from scratch. Though these areas would already suitable be for a high-tech multinational companies since so many already exist there (which would mean initial set up for Amazon would be a smooth process in terms of permits and zoning) and these kinds of procedures would be routine in an area of this nature, this also presents inflexibility and limited room for growth. These areas also intrudes on not only historical areas, but parks as well. This can prompt serious public concern and create legal issues for Amazon (lawsuits, public hearing debates, etc).

Error and Uncertainty

All data obtained from labs (Vancouver mask, roads, and landuse) were made for the purpose of students completing a lab. Since the labs were meant to teach specific

skills, much of this data was already clipped, transformed, etc. to answer the intended question of the lab. We do not have information on how this data was altered before using it. It may have already lost information which would have been beneficial to our project.

Other datasets we downloaded also contain error and uncertainty. The dataset we downloaded for our YVR location is from DataBC. Its purpose was to “aid in planning and support for emergency response along the coast” (DataBC, 2017). It also gave us descriptions of objects such as column names of each attribute, shortened names, data types, data precision, and additional comments which described what the importance of each attribute. It also gave contact information directly to an individual from the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development for inquiries about this dataset, and included dates of modifications and publications. However, this data does not tell us anything about data quality which means we do not know anything about the resolution of this vector data, any computational errors, any human errors such as digitizing/imagery mistakes, and etc. It also states the lineage of this data, and says the resource information was collected from peer-review provincial Resource Information Standards Committee (DataBC, 2017). Although it’s stated, this includes data management and analysis standards, there is room for error with any peer-revision process. This error is unknown to us.

The zoning districts data from the City of Vancouver does not include a purpose of its production, and the rest of the information provided is vague. For example, the only information on attribute data is that there is a “zoning district label” (City of Vancouver, 2017). In terms of data accuracy, it’s stated that some of the data was created using survey accuracy, but some is “not as precise” (City of Vancouver, 2017). We do not know which parts of the data have higher or lower accuracy, and we do not know the degree of high or low accuracy. It also does not give any information further than that in regards to data management, lineage, and collection. Both DataBC and the City of Vancouver are relatively reliable, being a government data source, but improvements can be made.

The content of the businesses layer we created was very selective. It does not involve all the high tech businesses. We used an online article to identify the Vancouver based startups and selected the ones that could be potentially related to Amazon. Furthermore, we added the Vancouver based high tech companies we knew to the list to make it more extensive. One exclusion we made was to only include companies that had their main headquarters in Vancouver. Therefore, any company that had a Vancouver office in addition to their main headquarters somewhere else was not included. The reason behind this is that Amazon could prefer to open its second headquarters near a location with the main headquarter of a company. Thus, presenting only the main headquarters in Vancouver showed a greater insight to the high tech sector of Vancouver.

Further Research/Recommendations

To build off our findings additional possible dimensions to add to our work would be to include additional requirements from Amazon. Some requirements we did not incorporate because of lack of data include initial square foot requirements of over 500,000, with possible expansion square footage of up to 8,000,000. There were also some optional but preferred requirements like proximity to universities which we did not include. There was also some requirements we inadvertently incorporated but did not directly address. Examples of this include a preference to urban areas and metropolitan areas with a population of over 1 million. Since our map does not directly communicate this information, it could possibly eliminate Vancouver as a top competitor if these met requirements go unnoticed.

In terms of analysis and research, I recommend to use Business Analyst to determine the 45 min drive time polygon from the airport. It would be the most accurate, direct, and efficient way to calculate this. We did not use this tool because we did not have access to it. We originally were going to include this data, however the first time we attempted to use Network Analysis, it deleted all our data when we used "getdata" to get instructions from the Geob370 lab. We also attempted to use an online mashup to find a drive time polygon and export and transform the projection of this data from Google Earth (it opened the polygon in Google Earth). Sadly, both attempts failed, which prompts us to believe Business Analyst would be the best option.

Finally, as a more overall recommendation to our work, it would also be more beneficial to use data with more thorough metadata. This would reduce sources of error and uncertainty mentioned above, and would increase the credibility of the map. Finer details may also be added to certain layers. Although finer details may not seem useful in the beginning stages of picking a new headquarter location, further along the implementation route they may have increased importance. For example, instead of just having the transit routes, it may be beneficial to also add stops and transit zones as this could be important when deciding least cost routes.

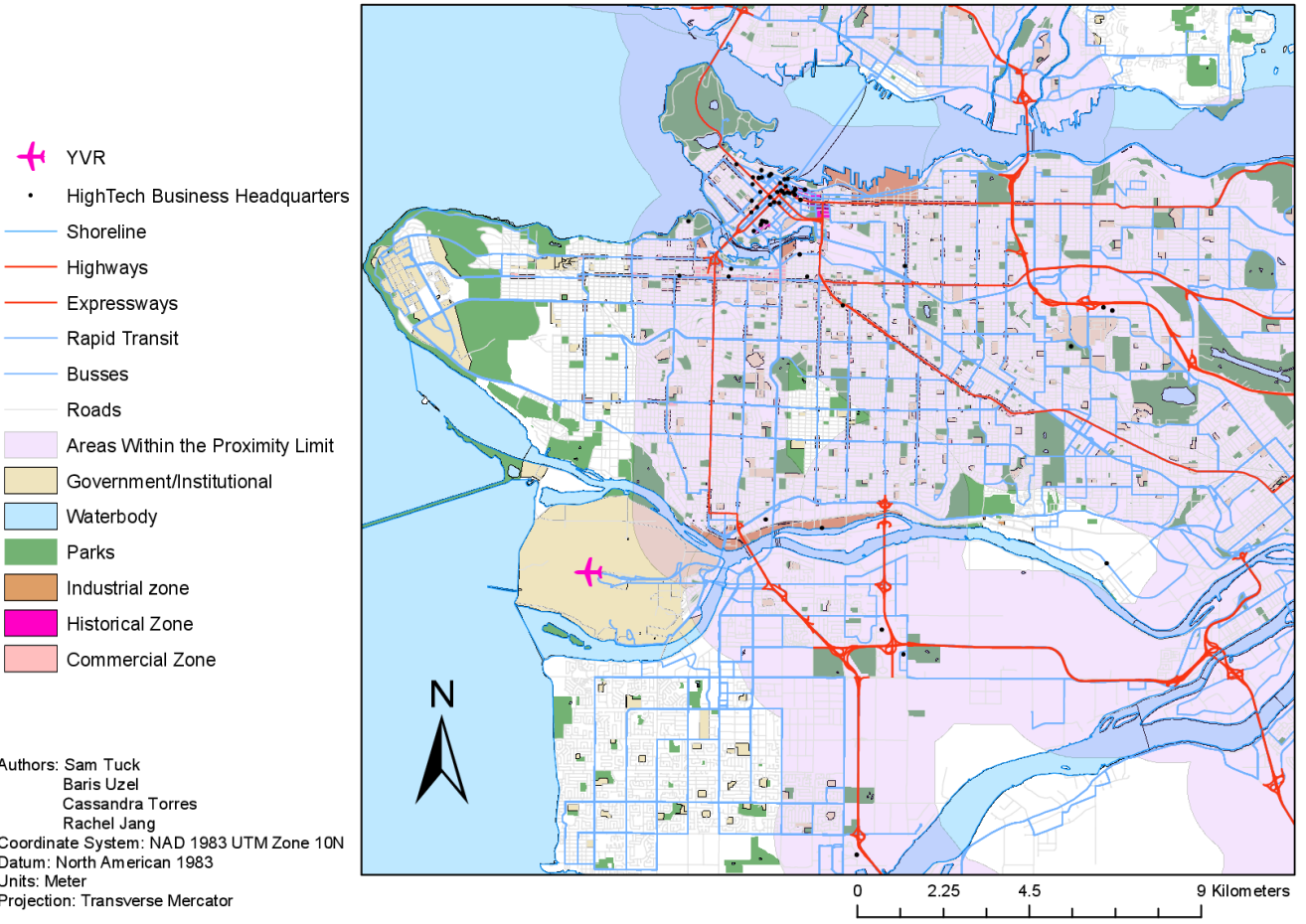
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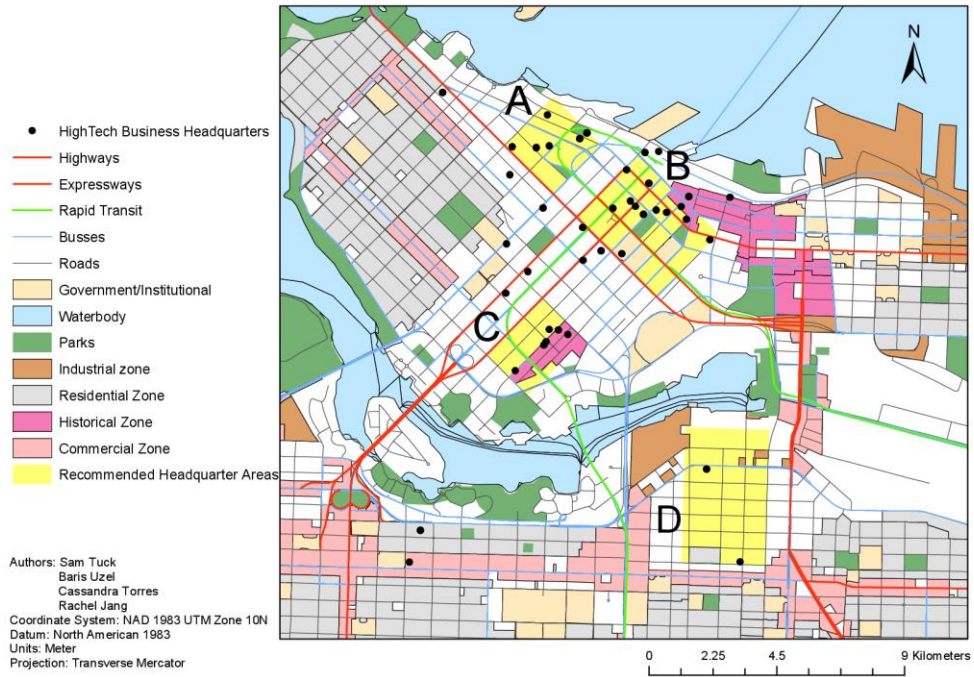
Appendices

Amazon HQ2 Vancouver: Location Suitability Analysis

General Spatial Requirements



Amazon HQ2 Vancouver: Location Suitability Analysis Downtown and False Creek Headquarter Recommendations



Amazon HQ2 Vancouver: Location Suitability Analysis Burnaby Headquarter Recommendations

