Central Line: Determining Potential Ridership and the Accessibility to the Skytrain for Surrey and the Langleys' Residents and Schools

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ABSTRACT

Surrey is a city with a growing population and has seen a growing demand for the construction of transit lines to increase the ease of transportation. A proposal that has been gaining traction up until the fall elections for the city of Surrey is the construction of an LRT line that would increase 'ridership' success to its residents. The recent municipal elections that took place during the fall season has brought an abrupt end to the project proposal, instead turning the project into an approved Skytrain line that stretches from King George to Langley Centre along the Fraser Highway. The purpose for this project is to test the 'ridership' success of the approved skytrain line, and propose an extension to the line into the Township of Langley. Looking at census data and the proximity to significant education establishments, like elementary and secondary institutions, it will allow us to understand the 'ridership' success of the skytrain line. This has been done by creating buffers that indicate walking distance in minutes from the proposed skytrain stations. The use of GIS software ArcGIS has allowed us to acquire, manage, and analyze data on the construction of the Skytrain line. The topic for this project is focused on the 'ridership' success for the residents of Surrey and the Langleys, and will look at how an extension to this approved line into the Township of Langley will prove beneficial to the growing population of the lower Fraser.

DESCRIPTION

The study area this paper will look at is focused on the areas of Surrey, the Township of Langley, and the City of Langley. The City of Surrey had proposed three transit lines premised on the reduction of congestion in the city. The major proposed LRT line depicts a route that connects with the terminus of the Expo line at King George. It was considered a comprehensive transit plan for the region. A route from King George station along Fraser Highway through the city of Surrey, into Langley centre have been visualized with the creation of maps during the climax of its push. Though what seemed to be a favourable idea by many, the construction of a potential LRT line have recently been rejected due to the recent 2018 municipal election of Surrey. What seemed like the end of a thoughtful project premised on the reduction of congestion in the city of Surrey, has turned into an approved Skytrain line to and from the township of Langley, with a terminus at Langley Centre and King George.

The potential 'ridership' success of the future Skytrain line is similar to the idea of the previously proposed LRT line. Data already exists from current operating lines such as the Expo line which permeate from Vancouver, Burnaby, New Westminster and into Surrey. Visual representations of the proposed potential LRT line stops exist but are not provided as actual databases under the city of Surrey. With the

proposed potential LRT line stops, the consideration of potential Skytrain stations have not yet been released. Potential Skytrain stations will be interpolated with knowledge of the potential LRT lines, while looking at population density of dissemination areas, mainly from Surrey. DA's provide information based on population density that will assist in the interpolation of potential Skytrain lines. Road data include accurate representation of local roads, major roads, and highways. Expo line data consists of the existing route and skytrain stops within the city boundary of Surrey.

METHODOLOGY

Acquire

The accumulation of our data was through 5 sources: Department of Geography - UBC, Canadian Census Analyser, and several city open data catalogues: City of Surrey, Township of Langley, and City of White Rock. The base map layer of Metro Vancouver and various vector data -- such as roads, school and landuse -- was acquired through the Department of Geography at UBC. Additionally, the data pertaining to Translink, specifically the Expo line, was also retrieved through UBC from the folder 'gvrd' providing us with the shapefile: 'PublicTransit2010'. Regarding the census data of dissemination areas for Surrey and the Langleys, they were obtained through CHASS Canadian Census Analyser. Lastly, zoning boundaries/boundaries and main hubs (e.g. main communities and centres) for each city (Surrey, Township of Langley, and White Rock) were acquired from the city's open data catalogue. Unfortunately, the City of Langley did not have their own open data source, thus leading us to create our own boundary through the 'editor tool' on ArcGIS.

Parse Filter

In regards to how we modified our datasets, the majority of the vector data acquired -- roads, schools, and landuse -- was clipped to the city boundaries. Conversely, as stated earlier, there was no boundary for Langley city. In order to maximize the results for our analysis, we created a polygon in the shape of the city boundary, which then allowed us to clip those exact same datasets to our newly created Langley City boundary. Afterwards, we did a tabular join; the census data table for Metro Vancouver was joined to the city boundary layers, thus permitting us to clip those layers to the city boundaries, leaving us with separate layers integrating DAs with the DA census data for Surrey and the Langleys. Lastly, we intersected the education layer with the buffers, but that did not provide us with a clear visual of which schools was in close proximity to the skytrain stops, so we concluded by performing another clip with the interested school and the buffers. The last step provided us with the visual we desired.

Mine

Our main analysis was performed through the creation of a multi-ring buffer, representing in meters, the equivalent of walking 5, 10 and 15 minute distances. The distances were calculated based on Google Maps' values for distance in which we took their value of walking time for 1 km and concluded the distance an average individual would walk in 5, 10, and 15 minutes. Below are the calculations produced in order to attain our values, which then was inserted into the software, which produced our buffers.

Calculations:

Google Maps: 1 km/ per 12 mins

i. 1000m/ 12 mins = 83m/ 1 min
   1. 5 mins x 83 m = 415m
   2. 10 mins x 83m = 830m
   3. 15 mins x 83m = 1,245m = 1.25km

Through creating the buffer we were able to use the 'select by location' tool to highlight the dissemination areas intersecting/touching the buffers and created a separate layer for analysis. The creation of this separate layer will provide a clearer image of which DAs are "touching" the buffers providing us with the specified population within each DA, allowing us to extract statistical numbers for our discussion section. Moreover, the intersected-clipped education layer showed us which and how many schools were in walking distances to the proposed stops.

Represent

In order to visualize our scenario as thoroughly as possible, we created 6 maps to show specific aspects of our project. The first map is a re-creation of the proposed LRT stops. This was created to give our map users a visual of what the LRT consisted of and where the stops were located. Additionally, an inset map was included because we wanted to take into consideration the map users not familiar with the Metro Vancouver Area. The second map is used to visualize our group's proposed stops for the up and coming skytrain line. Alongside our proposed stops, we wanted to show the main hubs (ex. City Centre, Guildford, Willowbrook, etc..) of Surrey and the Langleys as well as higher populated areas. In our third map and fourth, we displayed the walking distance buffers, which was to help determine the 'potential ridership'; this was shown by the highlighted DAs "touching" the buffers. Our fifth map is a zoomed up image of one of our proposed stops; this is to help explain why we think this stop is essential to our skytrain line. And lastly, our sixth map is focused on schools and how accessible the skytrain is to these schools.

Table 1: Original Datasets

Layer / Datafile name	Source	Uses	Entity/data model	Attributes	Modifications
Zoning Boundary **Rename:** Surrey Boundary	City of Surrey Complied and Extracted on: 11/26/18	To provide a clear boundary between the cities	Vector/ polygon	13 attributes (did not use any specific one)	Changes: projection to UTM Zone 10
Zoning Boundary **Rename:** White Rock	City of White Rock Complied and Extracted on: 11/26/18	To provide a clear boundary between the cities	Vector/ polygon	14 attributes (did not use any specific one)	Changes: projection to UTM Zone 10
Boundary **Rename:** Langley City	Created on 11/26/18	To provide a clear boundary between the cities	vector/polygon	4 attributes: ObjectID Shape Shape length Shape area	
Boundary **Rename:** Township of Langley	Township of Langley Complied and Extracted on: 11/26/18	To provide a clear boundary between the cities	Vector/ polygon	5 attributes: Shape Object ID Global ID Shape length and area	Changes: projection to UTM Zone 10
Roads	UBC Complied and Extracted on: 11/26/18 Complied and	To provide the main roads; to allocate Fraser Hwy for Skytrain stops/ path	Vector/ lines	35 attributes: Used - Street names	Clipped 3 times to each city boundaries

	Extracted on: 11/26/18				
Landuse	UBC Complied and Extracted on: 11/26/18	To determine which areas are commercial/res denstial/ parks and where it might be useful to put stops	Vector/ lines	5 attributes: ObjectID Shape Category Shape Length and Area	Clipped 3 times to each city boundaries
Communities **Rename:** Main Hubs	Township of Langley Complied and Extracted on: 11/26/18	To show populated/main areas in the city; to determine where it might be good to place stops	vector/ polygon	7 attributes: Shape ObjectID CommunityN CommunityC Hyperlink Shape length and Area	Changed the projection for UTM Zone 10
Urban Centres: **Rename:** Main Hubs	City of Surrey Complied and Extracted on: 11/26/18	To show populated/main areas in the city; to determine where it might be good to place stops	vector/ polygon	5 attributes: Shape Boundary type Name Shape Length and Area	Changed the projection for UTM Zone 10
Skytrain **Rename:** Expo Line	UBC Complied and Extracted on: 11/26/18	To show existing skytrain path	vector/ line	8 attributes: Shape ObjectID Mill Expo Muni Km Shape Length	Changed the projection for UTM Zone 10

				Expo_Mill	
Skytrain **Rename:** Expo Line Stations	UBC Complied and Extracted on: 11/26/18	To show existing skytrain stops	vector / points		Changed the projection for UTM Zone 10
Education **Rename:** Schools	UBC Complied and Extracted on: 11/26/18	To show schools close to skytrain stops/ to determine how accessible to schools	vector/ points	4 attributes: Shape Name Prec_Code Attribcode POI_ID	Changed the projection for UTM Zone 10, clipped 3 times to city boundaries, clipped to buffer
CSD shp **Rename:** Base Map	UBC Complied and Extracted on: 11/26/18	To provide background surroundings	vector/ polygon	19 attributes Highlighted Lower Mainland-Southwest Areas	
DA	DataBC	To show DAs; used to determine which areas are more populated (joined with census data)	vector/ lines	29 attributes (did not use any specific one)	Changed the projection for UTM Zone 10, clipped 3 time to city boundaries, selected the higher populated areas
DA census data **Rename:** DA	CHASS - Canadian Census Analyser	To show population data/ to determine potential ridership	Table	3 attributes: COL0 COL1 - population	N/A

	Complied and Extracted on: 11/26/18			COL2 - population density	
Shoreline	UBC Complied and Extracted on: 11/26/18				Changed the projection for UTM Zone 10

Discussion and Results

We decided to extend our proposed skytrain line to the border between the Township of Langley and Abbotsford (Fraser Hwy & 272 St) rather than placing the last stop at the prior LRT terminus (Fraser Hwy & 203 St) due to the increase in housing development and greater population growth in the Surrey/Langley area. According to the population growth rate provided by Statistics Canada, between the last two census collection years (2011-2016), Surrey's growth rate was 10.6%. Their growth rate has surpassed many other cities such as the City of Vancouver. Taking that into consideration, in about 10 years, Surrey's population will be 1.22 times greater than the 2016 population of 517,887 (Stats Can, 2016). The Township of Langley has also predicted that their own population will double in the next 20 years (Township, 2018). Additionally, the housing market in Metro Vancouver has increased immensely over the past 10 years with predictions of decreasing and increasing housing prices in the following year (Collins, 2018). Nonetheless, housing affordability has increased for all of Metro Van, especially for those residing in the Vancouver/ Richmond area. It has forced many families and residents to move closer to or move to the Fraser South and Fraser Valley area. With all that being said, we expect an influx of people moving in within the next two decades, leading us to create an extension that will be prepared to meet the demand for the next 20 years.

In order to enhance the validity of our analysis, we examined the several existing skytrain lines in the Metro Vancouver area to provide an example of distances covered, as well as travel time between each stop. Collectively, all the lines cover an average of 1.7km in distance and takes approximately 1.7 minutes of travel time. (Translink and Wikipedia, 2018). Additionally, rather than placing random points on a line, we spatially analysed Surrey and the Langleys to determine which locations will increase the potential likelihood of residents riding the skytrain. Our criteria for the location of proposed stops included highly populated areas, main communal areas within each city, and the amount of commercial

establishments. As indicated on map 2, many of our stops are located in areas with a population of equal to or greater than 995 people and/ or located in the main hubs within the three municipalities.

For further details on the stops' location, please refer to the appendices section in which we have table listing the distances covered between each stop and the reason for the stops' location.

During the process of creating these proposed stops, one location in particular, seemed of greater importance compared to the rest. This stop is called Clayton Heights, located on Fraser Hwy and 68 Ave, shown in map 5 below. We found this stop to be significant because 1) it is located near the border of the City of Surrey and the City of Langley, 2) its parameters include a large population -- approximately 17, 083 people 3) it is home to numerous commercial establishments important to its residents, 4) is becoming the central hub between the Surrey and Langley area, and 5) is located near two of the major highways used in Surrey/Langley. As stated earlier, more people are or will be moving more towards the Fraser Valley direction and Clayton Heights is a prime location. Clayton is beneficial in the sense that although it is close to Langley City, which has a fairly big mall (Willowbrook), restaurants, recreations, gyms, and etc., it is still located within the Surrey parameters allowing all the residents to gain the City of Surrey's benefit as well. This location is an area that can be considered "the best of both worlds".

We will now proceed to the analysis of the created buffers and the accessibility of our line to the population. According to the 2016 census data provided by Canadian Census Analyser, the population of the City of Surrey is 517, 887 and the population of the Langleys is 143,147 resulting in the total sum of 661,034 people. As shown on map 4, it may seem like only several DAs were selected to be intersected with the buffers, but a total of 252 DAs were highlighted on the map. To determine the percentage of the population selected, we divided the selected population count by the overall population of each city.

Calculations:

Surrey: 146, 985/517,887 x 100% = 28.4%

Langleys: 27, 034 + 42, 186= 69, 220 /143,147 x 100% = 48.4%

Surrey + Langleys pop. / total sum of both area population x 100% = (146,985 + 69, 220)/ 661, 034 x 100% = **32.7%**

The resulting percentage seems to correlate with the visual (map 5) shown below, but one of the issues that arose during the creation of our 5th map, was that many of areas emphasized on the map did not "physically" touch/intersect with the buffers that we created. The purpose of our buffer layer was to help us calculate the exact percent or show us the raw count of people that could walk 5 mins vs. 10 mins

vs. 15 mins to the skytrain stops. With that information, we could have provided the exact number of people who would have been able to access the skytrain stops via walking distances. Unfortunately, due to the buffer layer being one cohesive layer, we were unable to intersect each city's DA layer to the individual distances (e.g. 5 minutes vs. 10 minutes vs. 15 minutes). Therefore, we were unable to provide the specific values of the population that were able to access the skytrain stops via walking. Although, using the map produced, we estimated that about 15% from the 32.7% of the population would most likely be able to walk to the skytrain stops within the 15 minute parameters. Converting the percentage back to a raw count value, 15% would represent about 99, 100 people within the 3 municipalities. Furthermore, the direct accessibility to only 15% of the population may seem small, but according to the calculations for each city, the skytrain is almost available to 50% of the Langleys (looking at all highlighted areas in the Langleys) .

Additionally, we looked at the accessibility of the skytrain for schools in the area because of the curriculum changes in Surrey's education system (which will eventually affect other school districts depending on the success rates of their students). As the school curriculum has been leaning more towards a "personalized learning experience", we thought that the accessibility to the skytrain would allow for more opportunities and experiences outside the classroom. For this section, we were able to extract specific values of the schools that intersected with the walking distance buffers. As indicated in map 6, 46 out of 184 schools lie within our 15 minute walking parameters. Out of the 46 schools, 14 schools lie within 15 minutes away, 23 schools within 10 minutes away, and 8 schools within 5 minutes away from the skytrain stops. Although this may only represent 25% of all the schools within the 3 municipalities, it also signifies the potential for those schools to enhance their education program in regards to more experiential learning. Being able to access the skytrain by walking will also eventually lead to more benefits such as a not requiring as many bus drivers, less CO2 emissions released, and increasing the amount of physical activity.

In summary, although the skytrain is only accessible to less than half of the population amongst the three municipalities, the skytrain regarding the Langleys were more accessible to their population which is beneficial as they do not have as many transit opportunities as Surrey. These results can also be shown to school boards so that they may be able to incorporate more modes of transportation through the proposed skytrain system.

ERROR AND UNCERTAINTY

Census data of dissemination areas for Surrey and the Langleys were obtained through CHASS Canadian Census Analyser. CHASS is a map and data library that provides access to data at the

Dissemination area level and higher. The DA data used for this project is based on population density for 2016. It is important to acknowledge a shift in population density between the DA's within the city of Surrey and the Langley's because it is data collected two years ago. From 2011 to 2016, the city of Surrey experienced a growth rate of 10.6%, outpacing the city of Vancouver (Hallingham, 2017). Last year, the average count of new residents per month observed in the city of Surrey is 1,000 (Hallingham, 2017). Uncertainty occurs from the use of 2016 census data because of the change in population density that dictate the positioning of potential stations proposed for the skytrain. For this project, the positioning of skytrain line stops within the city of Surrey were based on data provided by the DA's. For the proposed extension of the Skytrain line into the Township of Langley, the proposal of potential skytrain stations also relied on DA's. Between the three municipalities of Surrey, City of Langley and the township of Langley, the Township of Langley was the fastest growing municipality observed from 2011 to 2016 (Hallingham, 2017). With the absence of current 2018 data, the placement of Skytrain line stops as shown in map 2 is based on census data retrieved from 2016, and does not reflect the best positioning of Skytrain stations based on the most recent population density of Surrey, and the township of Langley.

In map 3, the introduction of buffers indicate distance in minutes from each station to present ridership accessibility. The circle buffers at 5, 10, and 15 minutes indicate a general walking distance that does not keep into account prolonged street blockages due to construction, or other reasons that might cause road closure, with the potential to affect sidewalk accessibility for pedestrians. Walking distance is calculated on the average walking speed of a person, and lacks micro-level agency that walking distance in minutes is dependent on an individual's ability. With this in mind, the radius of each buffer provide a specific estimation for walking distance in minutes, and does not keep account the residents who could drive, bike, or use other modes of transport other than foot, to get to a skytrain station.

FURTHER RESEARCH/ RECOMMENDATIONS

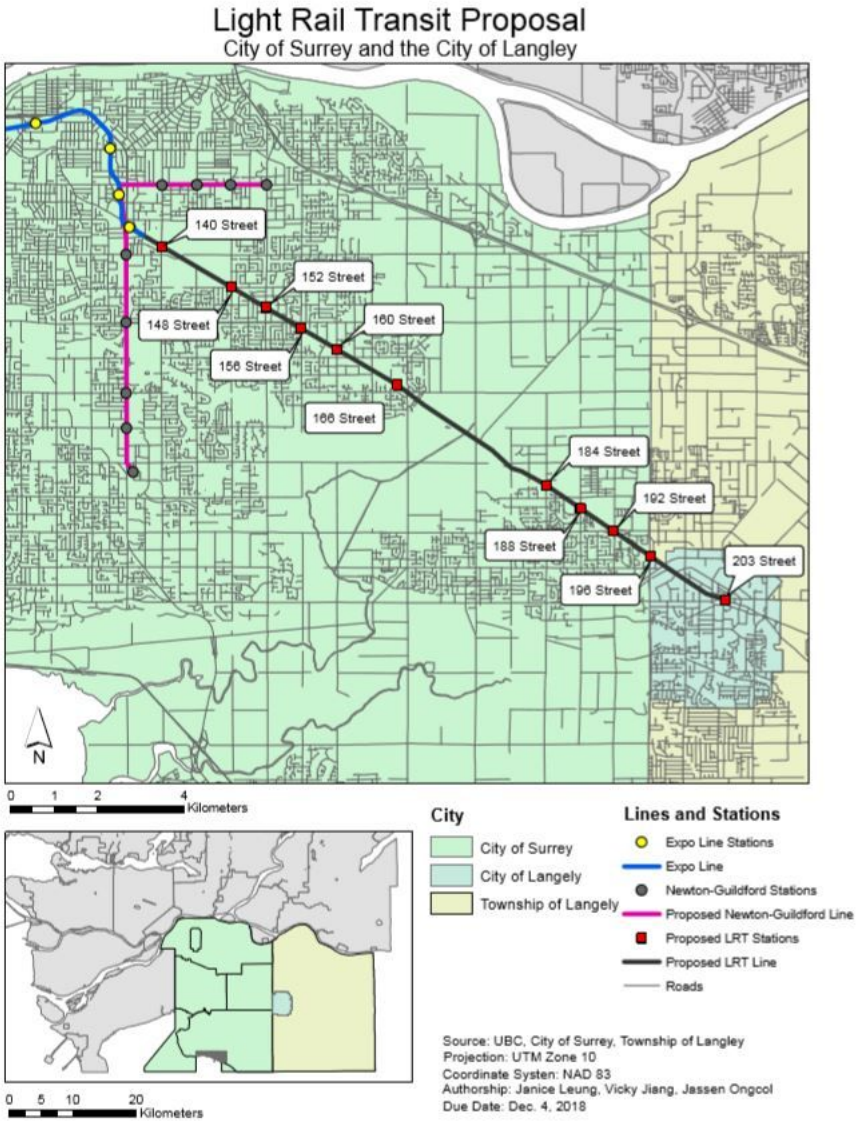
The LRT proposal has its initial implications as being a preferred option for sustainable regional growth. Air pollution is a growing concern in many Canadian cities, and studies show that transportation emissions is a major contributor for growing urban densities (Topalovic et al., 2008). "Light rail transit has a major role to play in reducing the costs of air pollution due to transportation sources. Its ability to carry large numbers of passengers, reduce congestion and increase accessibility makes it a lucrative tool for reducing pollution." (Topalovic et al., 2008, p.21). Looking at scholarly work about the economic and environmental impacts of LRT lines allow us to understand why the city of Surrey initially preferred the LRT system. Further research that pertains to this topic of pollution and emissions is the topic about cost-benefits of the LRT production, construction, distribution and use. What cost-benefits does the

entirety of an LRT entail? What makes a Skytrain line better or worse than an LRT in terms of their emissions? Because the approved Skytrain line is on the exact same route of the proposed LRT, we cannot compare both lines on their proximity and accessibility to commuters, for they are similar. Further research can be of the difference in land surface area disruption or alteration that has to occur from the construction of either the LRT or Skytrain. Normally LRT's have their own path, built separately from or on existing roads, while skytrain lines are elevated with each station occupying a lot of space. Further research can pertain to the comparison of land surface occupancy between the LRT and Skytrain, and how it defines the development of adjacent areas for housing or commercial use.

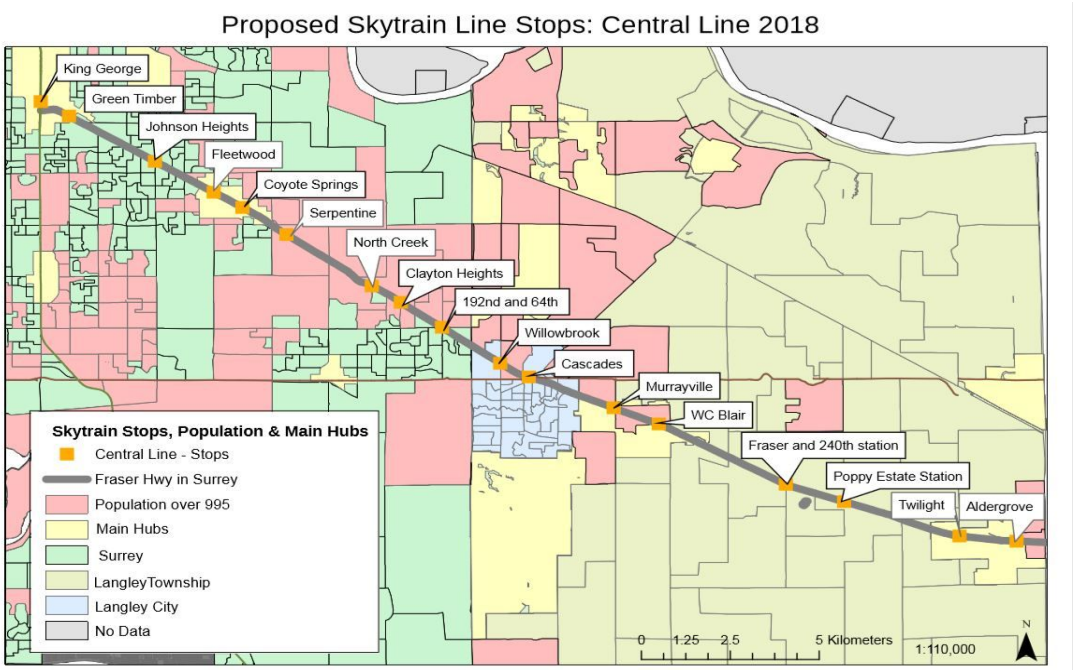
APPENDICES

Maps

A) Map 1 - LRT Proposal

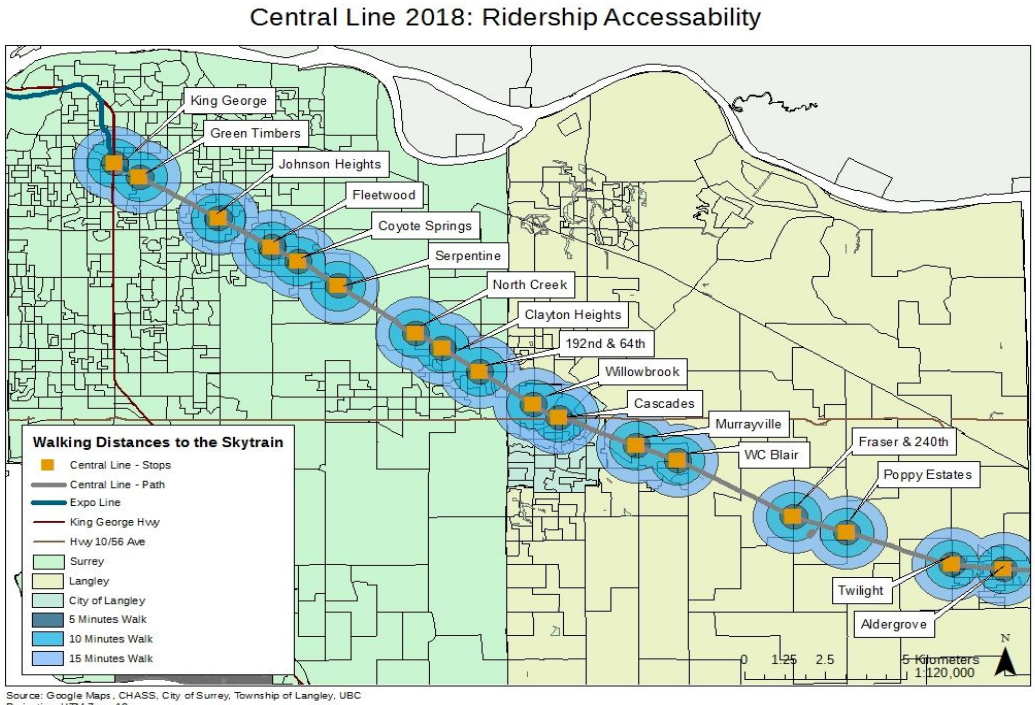


B) Map 2 - Proposed Stops



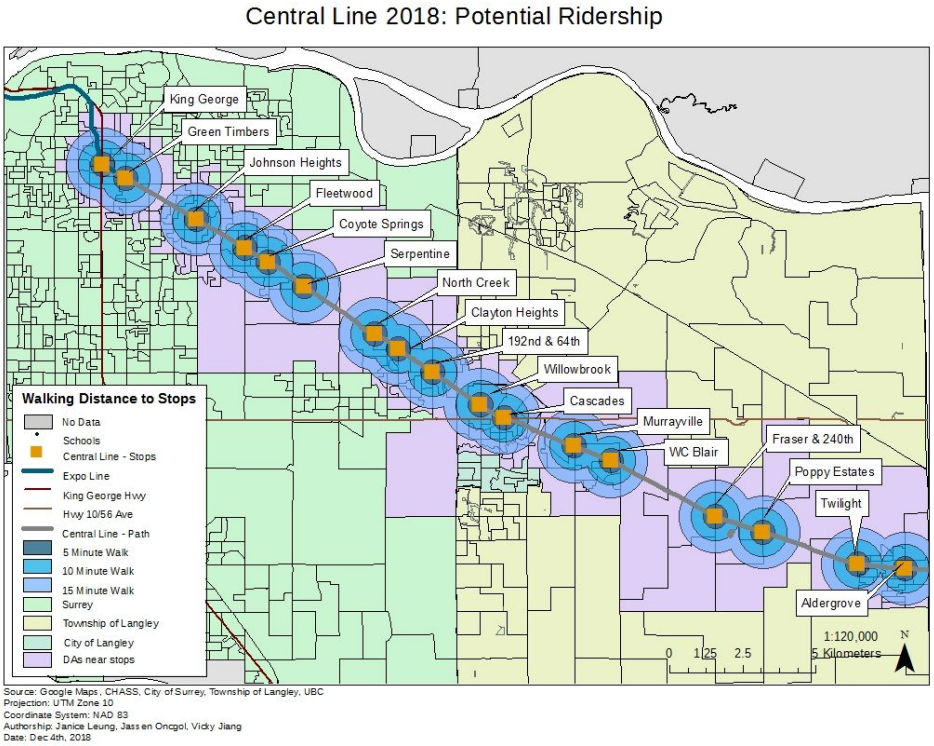
Source: Google Maps, CHASS, City of Surrey, Township of Langley, UBC
Projection: UTM Zone 10
Coordinate System: NAD 83
Authorship: Janice Leung, Jassen Oncgol, Vicky Jiang
Date: Dec 4th, 2018

C) Map 3 - Accessibility to Skytrain

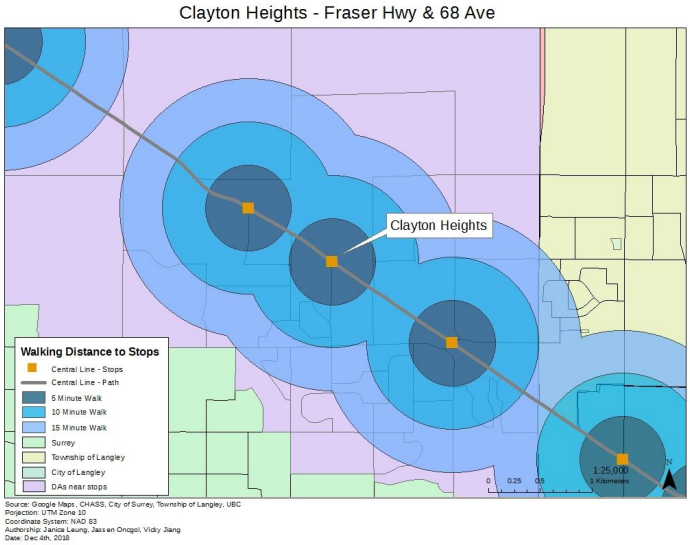


Source: Google Maps, CHASS, City of Surrey, Township of Langley, UBC
Projection: UTM Zone 10
Coordinate System: NAD 83
Authorship: Janice Leung, Jassen Oncgol, Vicky Jiang
Date: Dec 4th, 2018

D) Map 4 - Accessibility to Skytrain via DAs

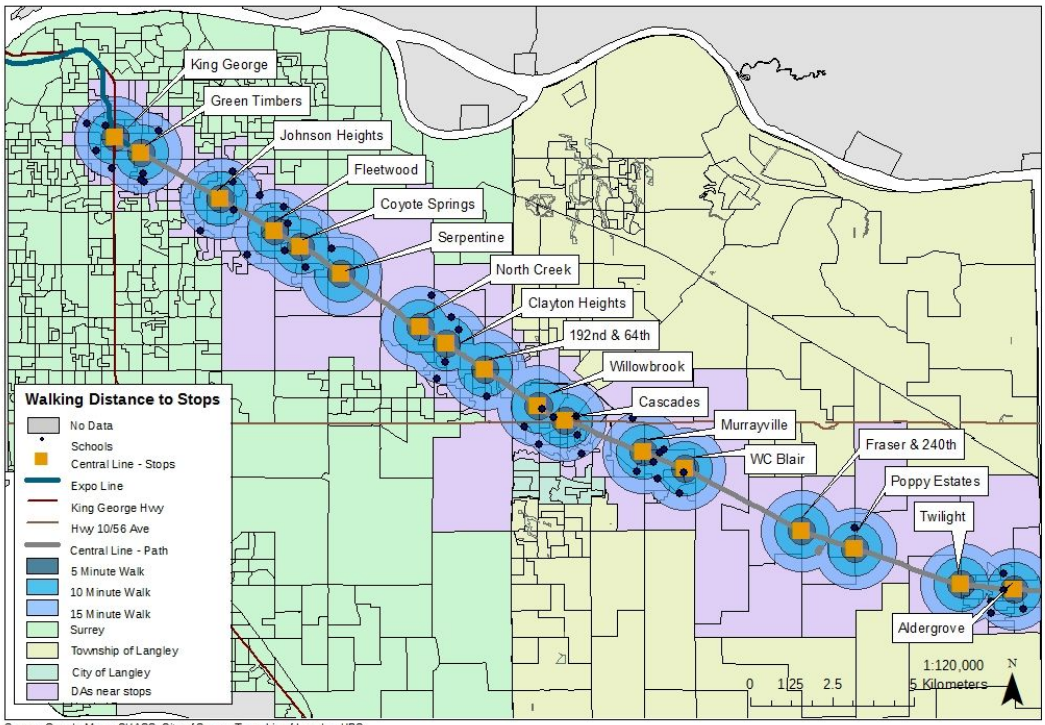


a) Map 5 - Clayton Heights



E) Map 6 - Accessibility for Schools

Central Line 2018: Accessbility for Schools



Source: Google Maps, CHASS, City of Surrey, Township of Langley, UBC
Projection: UTM Zone 10
Coordinate System: NAD 83
Authorship: Janice Leung, Jassen Oncgol, Vicky Jiang
Date: Dec 4th, 2018

<u>The Proposed Central Line Details</u>

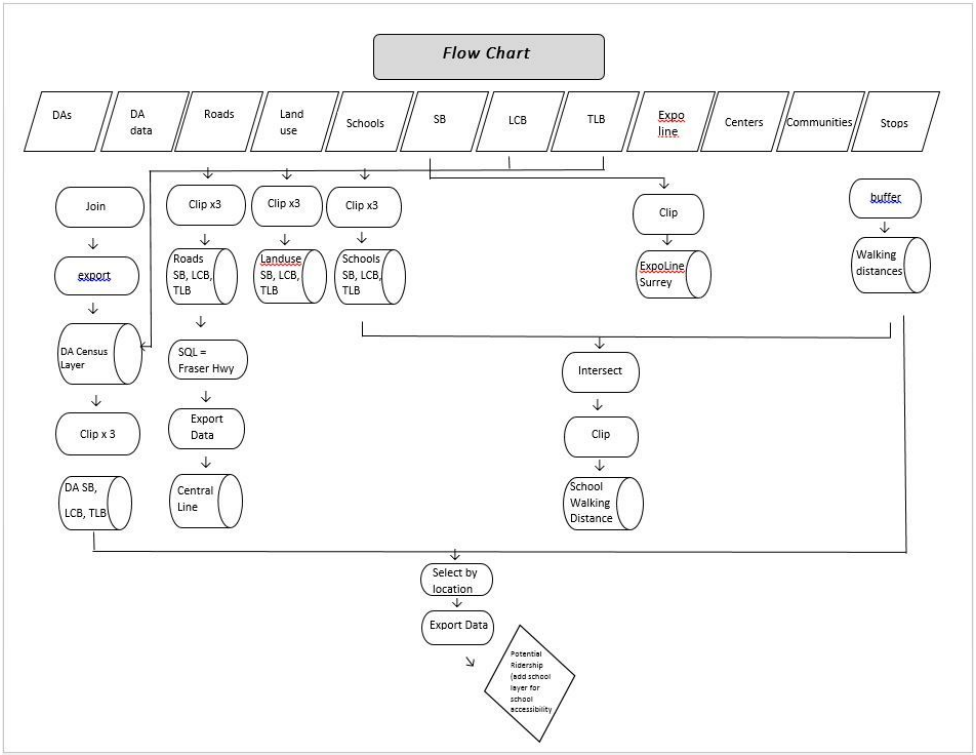
1. King George Station	It is the terminus station of the expo line & also the first stop of our Central Line.
2. Green Timber	This stop is located at 140th street and Fraser hwy. It covers about 1km from the King George station and the Green Timber station. We decided to place a stop here for family members and other practitioners or workers because there is an outpatient care nearby.

3. Johnson Heights	This stop is located at 152nd street and Fraser hwy. It covers about 3.7 km from the Green Timber station and the Johnson Heights station. We decided to input a stop at a further distance because in between the streets covers a lot more forest than residential living spaces. 152nd is also a major hub for students and families, which there are many restaurants, several grocery stores, gas stations, and schools.
4. Fleetwood	This stop is located at 160th street and Fraser hwy. This stop covers about 1.9 km from the Johnson Heights station to the Fleetwood station.There are various schools, many commercial spaces, banks, and grocery stores.
5. Coyote Springs	This stop covers from 160th street to 164th street. This stop covers about 950m from the Fleetwood station to the Coyote Springs station. 164th is an important stop because it is near to the Surrey Sport & Leisure Centre which is a very popular recreation for many families and residents in the area.
6. Serpentine	This stop covers from 164th street to 170th street in Surrey. This stop covers 1.5 km. We decided to put a stop at 170th street because there is a high population near to the golf course area (1125 people). Putting a stop here can both target the 168th population as well as the residential areas further down the street
7. North Creek	This stop is located at 182nd street and Fraser hwy. We did not incorporate any more stops in between these two because there is a lot of empty land past the residential areas before the golf course. Also, there are a lot of residential areas nearby the 182nd street and fraser hwy.
8. Clayton Heights	This stop covers from 182nd street to 68 Ave (Clayton Heights station). The stop covers 1.1km. The 68th avenue stop is near to an entrance of the shopping mall. There's a higher population as it is near to the residential area and also a commercial shopping mall. There are shoppers Drug mart, RBC Royal Bank, Tim Hortons, Save On Foods all these commercial stores.

9. 192nd and 64th	This stop covers from 68 Ave to 192nd street. The stop covers 1.3km. There is also a small commercial centre nearby the stop. There is a scotiabank, tim Hortons, pharmacy. This stop is important because it is also near to the residential area and also the commercial centre.
10. Willowbrook	This stop covers from 192nd to Fraser Hwy and Highway 10. This stop covers 1.4km. The stop is right beside the Willow brook Shopping Centre.
11. Cascades	This stop covers from Fraser and Highway 10 to 203 St. This stop covers 1.3km. We chose to place a stop here because it is right beside the Cascades Casino. It will be more convenient for people to come to gamble.
12. Murrayville	This stop covers from 203 St to 216st. This stop covers 2.8km. We chose to place a stop here because it is near to some commercial stores - Tim Hortons, Hybrid Athletics, McDonald's. It is also near to the Langley Canadian Reformed Church & Immanuel Christian Reformed Church. It is also near to some schools - Langley Fundamental Elementary & Credo Christian High School.
13. WC Blair	This stop covers from 216th to 222 st. This stop covers 1.3km. The stop is near to the Langley Memorial Hospital. Having a skytrain to there, patients can easily get there for medical appointments. It is also near to the WC Blair Recreation Centre, RCMP, School Board office - Langley School District #35, TD Bank etc. This stop is also near to some restaurants such as Nikko Sushi, A&W Canada. It will then be more convenient for people to get food.
14. Fraser and 240th	This stop covers from 222 st to 240 st. This stop covers 4.0km. There are some commercial stores nearby eg English & Le Page Pool & Spa, Bow Wow Food and Hilltop Diner Cafe and Grove Cedar and Mt Pleasant Motors.

15. Poppy Estate	This stop covers from 240 st to 248 st. This stop covers 1.7km. This stop is near to the Poppy Estate Golf Course. It is also near to some grocery stores such as the otter co-op...
16. Twilight	This stop covers from 248 st to 264 st. This stop covers 3.4 km. It is near to the Aldergrove village. It is also near to different kinds of eateries such as McDonald's, Pizza Hut, Tomo Sushi, Subway, White Spot. It is also near to the Best Western Plus Country Meadows Inn. Also near to Save-on-Foods
17. Aldergrove (Terminus station)	This stop covers from 264 st to 272 st. This stop covers 1.6km. This stop is near to the Aldergrove Community Arena and also the Aldergrove Heritage Society. The stop is also near to many commercial stores such as the Salvation Army Thrift Store, Dollarama, 7-Eleven It is also near to different eateries such as the Abby Pizza Place, Aldergrove Market & Super Canadian Pizza, Veronica's Gourment Perogies.

Flowchart



SB = Surrey Boundary

LCB = Langley City Boundary

TLB = Township of Langley Boundary

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