Project Assignment 1: Proposal [maximum 5 pages]

Name(s): Ryo Tabata & Dylan Stevens

Student number(s): Ryo: V00967093, Dylan: V00957595

Section 1. Topic and Dataset [recommended length: 1 page]

1.1. What is the data about?

The dataset about biking trails in Vancouver provides comprehensive information, including detailed descriptions of each trail, their specific locations, and classifications.

1.1.1. Describe the data cases and data dimensions in the dataset

The data dimensions are Object ID, Bike Route Name, Street Name, Bikeway Type, Subtype, Status, Street Segment, Type Overall Direction, Bikeway Direction, Vehicle Direction, Speed Limit, Surface Type, AAA Network, AAA Segment, W/N Bound Type, E/S Bound Type, Snow Removal, Segment Length, Year of Construction, Construction Note, Upgrade. Each data case is an additional bike trail in Vancouver. We will only be using the dimensions that are relevant to our questions.

1.1.2. Describe the size of the dataset

This dataset set contains 3669 data cases, and approximately 20 data dimensions. However, we will only be using around 10 of the data dimensions for our dataset, since there are numerous data dimensions that don't provide useful information for the questions we want to answer. For example, bike direction and vehicle direction are dimensions that don't provide useful information, while segment length and year of construction do provide useful information for us.

1.1.3. Describe the nature of the dataset

This is a relational dataset table, with columns as data dimensions, and rows as data cases.

1.2. How did you collect the data?

After surveying open data sets from local municipalities, my partner and I wanted to find detailed information on cycling and transportation. We decided to browse the city of Vancouver's open data sets, as we have both cycled there before and enjoyed the urban biking experience we had. We downloaded the dataset as a xlsx file and parsed through various data cases to see if it would suffice. The dataset is available in multiple formats including csv, and has detailed columns which did not require much work to understand.

Link to dataset: https://opendata.vancouver.ca/explore/dataset/bikeways/

1.3. Why does the data matter to you?

As both my partner and I are avid cyclists, we are interested in the development and data behind the cycling industry. We chose a topic about biking routes because it encompasses several key areas of interest. Understanding the variety and characteristics of biking routes can enhance our personal cycling experiences, offering insights into new paths we may take. Additionally, by examining the safety aspects and identifying potential hazards(snow removal or speed limit) on different routes, we can contribute to

efforts aimed at improving infrastructure and ensuring safer rides for the cycling community. This topic also allows us to explore the environmental benefits of cycling, highlighting its role as a sustainable mode of transportation that can reduce carbon emissions and alleviate traffic congestion.

Section 2: Data Questions [recommended length: 1 page]

What are interesting data questions?

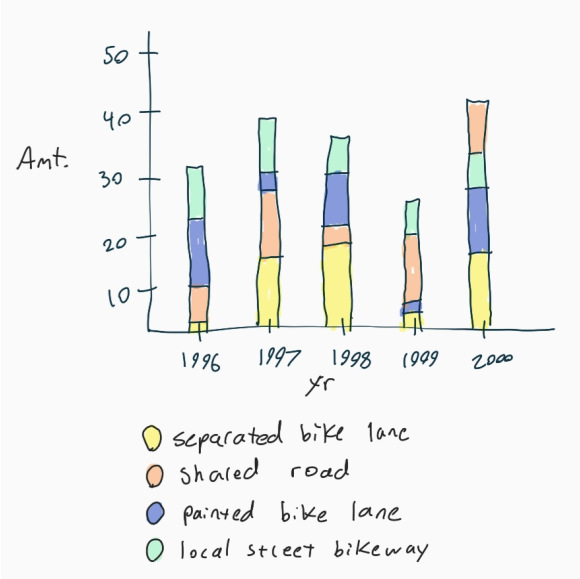
	Question about the data	Why is this question interesting to you?	Why is visualization well suited to answering this question?
Question 1	Is the city of Vancouver making trends in the right direction to create more bikeways by adding more km of bikeways or more bikeway routes?	The question examines Vancouver's commitment to sustainability, public health, safety, and urban accessibility by evaluating its efforts to expand bikeways, which can significantly impact the city's environmental footprint, traffic congestion, and quality of life for residents.	A visualization will help to understand the trend in year by year additions to the cities' bikeway infrastructure. The 3000 lines of data are impossible to understand by themselves, but by grouping certain things together and using statistics on the dimensions for segment length and year of construction, we can visually see whether there are trends in the right direction or not.
Question 2	Are there disparities in bike infrastructure quality between neighborhoods and areas in the city?	This question highlights the issues of equal accessibility in Vancouver neighbourhoods, and may reveal areas of potential inequality for a safe and convenient cycling route for citizens. Understanding these disparities can inform efforts to ensure all communities can equally benefit from future biking infrastructure improvements.	In order for the city of Vancouver to sustain an active bikeway transportation culture and network, there needs to be a sufficient share of bikeway infrastructure throughout areas. A visualization will help to put in perspective what areas need to be addressed sooner rather than later, and can help to see the bigger picture of what areas the city has made improvements on already.
Question 3	Is the city more committed to 'AAA' bikeways? Meaning fully protected bike lane, or off-street bikeways?	A 'AAA' bikeway means that the bikeway is either a fully protected bike lane/path, an off-street bike lane, or a local road. These are more desirable for cyclists, because it allows us to prioritize enjoyment rather than staying safe while traveling.	Oftentimes bicycle infrastructure visualizations can be misleading, since shared streets (just a regular street with no bike lane) are not considered 'good' bike infrastructure, so we want to visualize what kind of trails, protected bike paths, and fully cyclist/pedestrian areas exist in the city of Vancouver.

Section 3: Design Ideation [recommended length: 3 pages]

For each design, provide 1) a sketch; 2) a description of the sketch; and 3) a description of the data questions the sketch can help answer.

3.1. Sketch 1

3.1.1. Image of the sketch



3.1.2. Description of the sketch and design rationale

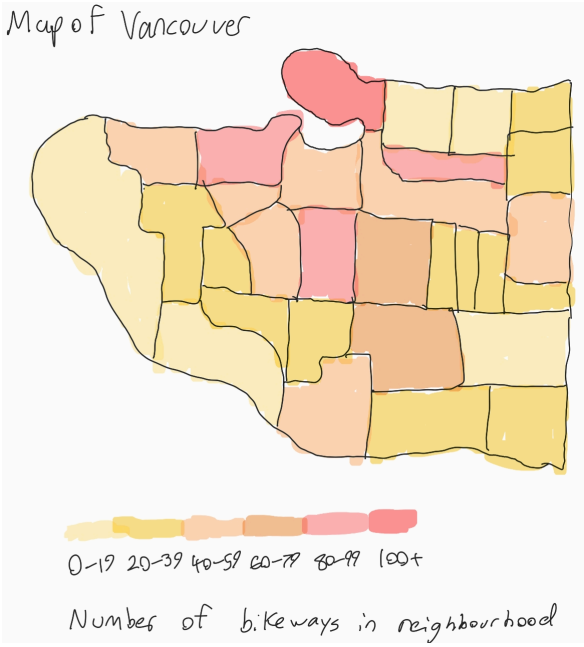
This sketch uses an x- y graph where the x-axis represents the years, starting from 1996-2000, and the y-axis shows the number of biking trails built that year. The bike trails are categorized by color into four types: separated bike lanes in yellow, shared roads in orange, painted bike lanes in blue, and local street bikeways in green. We chose a stacked bar graph to effectively compare the amounts of different bike paths and used height to highlight the distributions between them. We thought using colors to differentiate the types was the best choice, as they contrast well with each other.

3.1.3. Which data questions the sketch can help answer, and why

This sketch would answer question one. By graphing the number of biking trails by year, we can determine whether there is a consistent increase in the total number of bikeways per annum. The use of a stacked bar graph separates different types of bikeways by color, enabling us to see not only the overall number of bikeways but also the distribution among various types such as separated bike lanes, shared roads, painted bike lanes, and local street bikeways. This differentiation is crucial for assessing whether the city is diversifying its bikeway infrastructure or focusing on specific types as well.

1.1. Sketch 2

3.2.1. Image of the sketch



3.2.2. Description of the sketch and design rationale

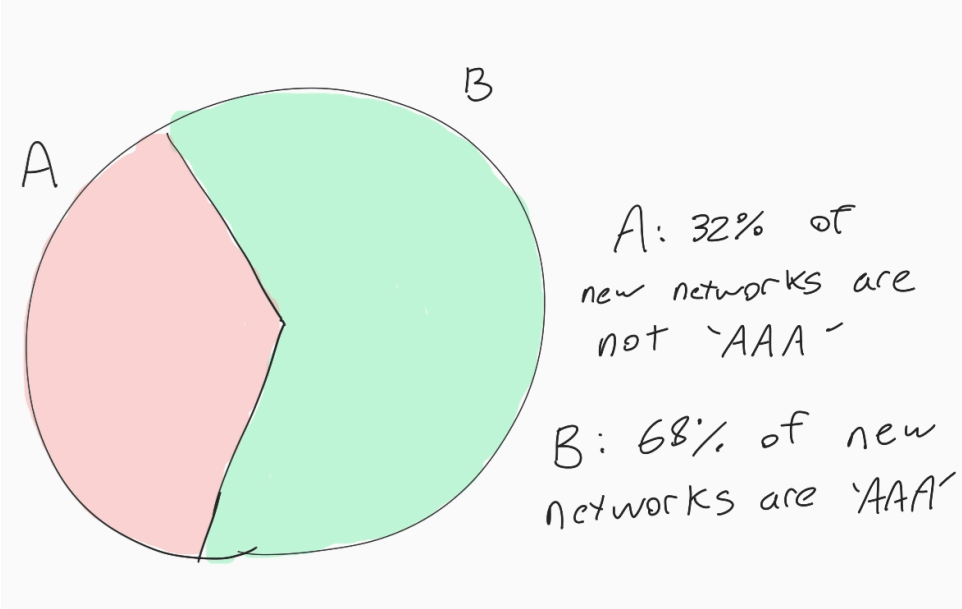
In this sketch, we have a map of the Greater Vancouver area with each neighborhood clearly delineated, titled "Map of Vancouver." Using color saturation, we indicate the number of bikeways in each neighborhood: light yellow for 0-19 bikeways, yellow for 20-39 bikeways, light orange for 40-59 bikeways, orange for 60-79 bikeways, light red for 80-99 bikeways, and red for 100+ bikeways. This color gradient effectively represents the concentration of bikeways, providing a clear visual depiction of their distribution across different neighborhoods.

3.2.3. Which data questions the sketch can help answer, and why

This sketch would answer question two. By using color saturation to represent the number of bikeways, the map makes it easy to identify areas with high and low concentrations of bike infrastructure. Neighborhoods with light yellow, indicating 0-19 bikeways, would suggest areas with minimal bike infrastructure, potentially pointing to a lower quality or lack of accessibility for cyclists. Conversely, neighborhoods shaded in red, representing 100+ bikeways, would indicate a high concentration of bike infrastructure, suggesting better quality and accessibility for cyclists. This visual representation allows for a quick assessment of disparities between neighborhoods. Areas with lighter colors would stand out against those with darker colors, clearly showing which neighborhoods are lacking bike infrastructure. This disparity can then be analyzed to determine if there are socio-economic, geographical, or policy-related reasons for the uneven distribution.

1.1. Sketch 3

3.3.1. Image of the sketch



3.3.2. Description of the sketch and design rationale

This sketch is a pie chart with two categories, A and B. "A" represents new Vancouver bikeway networks that are not AAA (All Ages and Abilities), while "B" represents those that are AAA. The pie chart uses different colors for each section to clearly differentiate and juxtapose the two categories. Each category is also labeled on the legend beside. The visual variables include color hue to show a clear difference between the categories of 'AAA' and non-'AAA' roads, and area to show the actual percentages themselves.

3.3.3. Which data questions the sketch can help answer, and why

This sketch would answer question three. The data question we are trying to answer is whether or not the city is more committed to 'AAA' bikeways. By showing the visual difference between bikeways that are AAA and those that are not, the viewer can clearly see whether or not more safe bikeways have been built. This sketch quickly and effectively indicates the percentage of bikeways that are safe and fully protected, versus those that are shared roads.