Dashboard Report

1) Exploratory Data Analysis

An exploratory data analysis was performed gathering information regarding the percentage of waterfalls and cascades accessible for visitors, with 57.28% being public and accessible, and 27.18% public but inaccessible, while 15.53% were private.

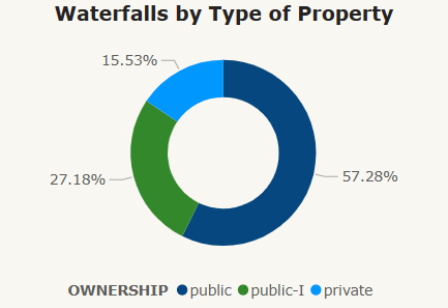

Figure 1: Waterfalls by Type of Property

Simultaneously an analysis was conducted regarding the average rating and total votes available for all public accessible waterfalls and cascades within the city of Hamilton, with the lowest rating being 3.54 Webester Falls and the lowest number of votes of only 5 votes for Dewitt Falls. The highest number of votes was for Albion Falls with 4265 votes and the one with the highest rating Canterbury Falls, coincidentally three of them categorized as cascades and only one of them, the lowest rated (Webester Falls), is categorized as a waterfall, interestingly all of these waterfalls and cascades belong to different communities in the city of Hamilton giving us some insight that no single community dominates or lags behind overall.

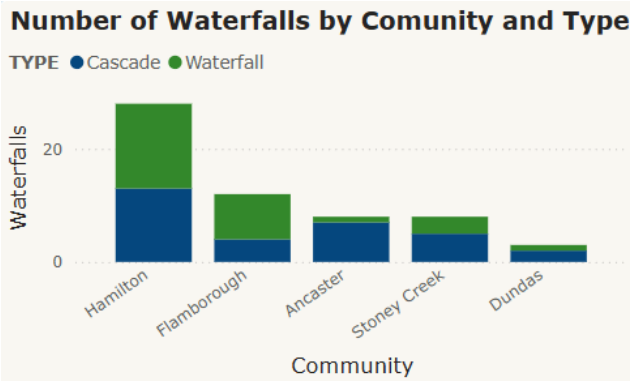

Figure 2: Number of Waterfalls by Community and Type

2) Route Analysis

Using the DBDCAN method three routes were defined and clustered based on closeness between destination points and origin stations. These three routes (South, Central and North) counted with similar average ratings overall varying from 4.1 to 4.3, with the South route having almost 4 times the number of votes as each of the other two routes. Based on this the estimated demand distribution favored the South route since it appears to be the most popular amongst all of them.

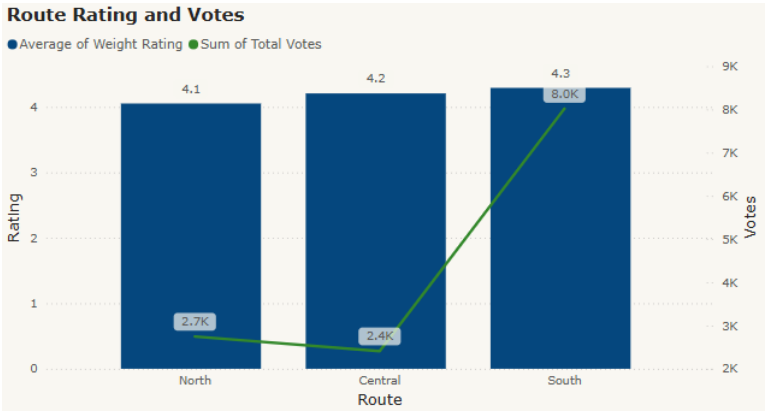

Figure 3. Route Rating and Votes

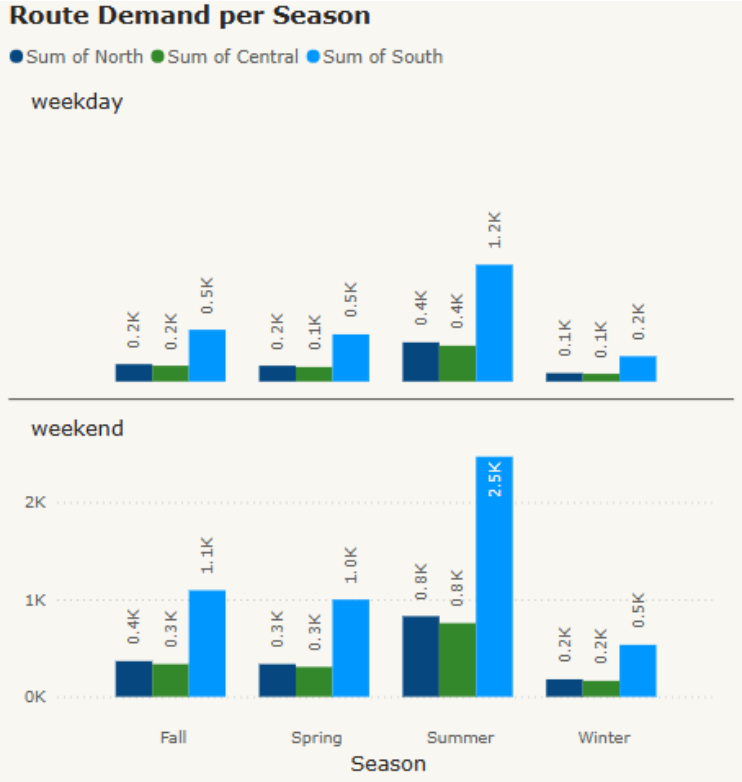

Figure 4. Route Demand per Season

3) Optimization Insights

Based on the output of the Linear Programming model, an interactive dashboard page was created to display the total number of trips and CO2 emissions per season, weekday, and weekend.

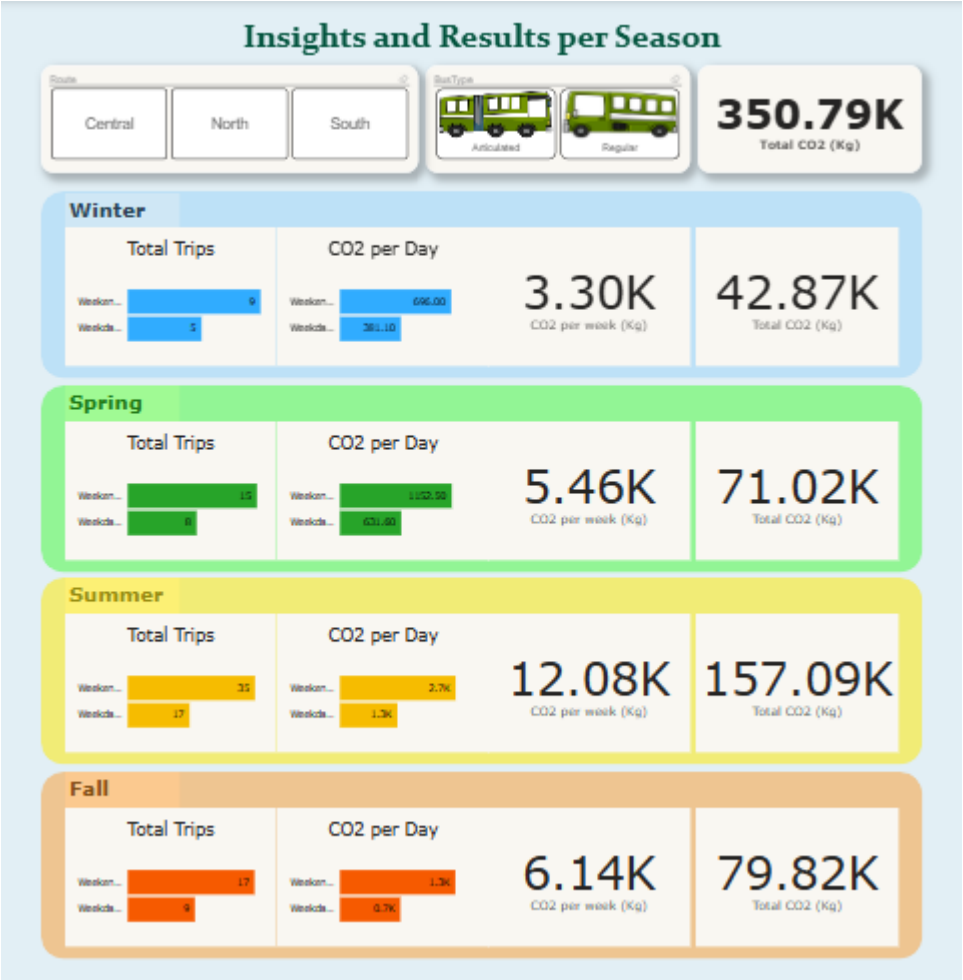

Figure 5: Insights and emission per seasons

The total CO2 consumption for a year is more than 350,000 kg. It can be observed that by a great difference, the season that generates more pollution is summer, with 157,000 kg in total or 12.08 kg per week, distributed between 66.8% on weekends and 33.18% on weekdays. The number of trips is related to CO2 emissions; therefore, it is to be expected that the summer season being the one with the most trips (on weekends and 17 on weekdays) is the one that produces the highest amounts of CO2.