



Supporting Carshare Vehicles for the City of Vancouver: Benefits of Corporate Carshare

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About the Author

Rainer Lempert is an MSc candidate at the UBC Institute for Resources, Environment, and Sustainability.

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1. Executive Summary

Carsharing Context

Carsharing is a service where members have access to a fleet of shared vehicles distributed across a city. Members can book a vehicle when needed, allowing for the convenience of vehicle ownership while reducing the need to own private vehicles. The popularity of carsharing in North America has expanded rapidly over the last decade, growing from only 30,000 members in 2003 to over 1 million members in 2013. The two primary forms of carsharing are a one-way or free floating model, where users can pick up and drop off vehicles anywhere inside a service area, and a two-way or round trip model, where members pick up the vehicle at a specific location and later return it to that starting location. Carsharing has existed in the City of Vancouver since 1996, when the Cooperative Auto Network (which later changed its name to Modo), a two-way carshare operator, was founded. Since then three other carshare operators, Car2go, Evo, and Zipcar, operate within the city.

City of Vancouver Corporate Carsharing Program Context

In 2007 the City of Vancouver (COV) initiated a Request for Expressions of Interest (RFEOI) for carsharing services for COV work related travel. In 2008 City Council approved the selection of Modo (named the Co-operative Auto Network at that time) and entered into a contractual agreement. In 2009 the City's (corporate) Car Share Program began. Employees can register with Modo under a business membership. The program enables members to use the Modo fleet of cars, in addition to a small fleet of City-owned and maintained vehicles, for work-related transportation. COV fleet cars were included in the program primarily to ensure vehicle availability and increase flexibility for COV employees.

The Corporate Carsharing Program enables employees to commute more sustainably to work. Previously, employees who did not belong to departments that had a designated department vehicle would need to drive their private vehicle to work if they needed to travel throughout the day for work business. Now, employees can bike, walk, or take transit to work and rely on the Corporate Carsharing Program instead of their private vehicles for work travel. The program also enabled the City to reduce its fleet by thirty-three vehicles, which occurred at the inception of the program.

Since 2009, the program has grown considerably. In 2009, 370 employees registered for the program and 112 used the service at least once. There were 803 bookings, an average of 7 bookings per active member. In 2017 number of members, active members, overall usage, and usage per member had all increased. 1,030 different employees were registered and 609 active members booked 12,132 trips, an average of 20 bookings per active member. The program increased from serving one City worksite, City Hall Campus, to serving twenty-two City worksites across Vancouver.

Greenest City Scholar Project Objectives

The objectives of this project are to analyze and interpret the financial, environmental, and community-wide implications of Corporate Carsharing first outlined in the May 12, 2008 Administrative Report that proposed the Corporate Carsharing Program. The Administrative Report suggested that Corporate Carsharing would be

approximately as financially viable as allowing employees to travel in departmentally assigned vehicles on a department-to-department basis, the old status quo. The Report also suggested there would be strong environmental, social, and community benefits of the Corporate Carsharing program. This project aims to discern whether these benefits have been realized.

Financial data and trip data from Modo vehicles and COV fleet vehicles was compared to understand the economic and environmental viability of the program. To understand the community benefits and social influence of Corporate Carshare, a survey was administered to members of the program, with questions designed to test for changes in behavior and awareness of green transportation since joining the program. Modo also provided carshare utilization density maps of locations installed at the request of the City, to test whether Corporate Carshare has an impact on greater public access to carshare and community carshare growth.

This research supports the COV Greenest City 2020 Action Plan, Vancouver's environmentally friendly plan to realize a healthy, prosperous, and resilient future for our city. In particular, this research aligns with Goal 4: Green Transportation, and Goal 1: Green Economy. This research also supports the COV Renewable City Action Plan, the City's goal to be 100% dependent on renewable energy sources by 2050.

General Findings

Financial Report

- The costs of Corporate Carshare were shown, through several complementary analyses, to be similar to allowing employees to travel in departmentally assigned vehicles on a department-to-department basis, the old status quo.
- Yearly costs associated with COV fleet cars have higher variation than costs associated with Modo membership and utilization fees. This is in large part due to inconsistent maintenance costs for City-owned vehicles, which can fluctuate yearly by a factor of greater than five.
- Corporate Carshare may be more financially advantageous than this analysis suggests, since it is difficult to calculate all savings, including vehicles that would have otherwise been added to City fleets, due to the program.

Greenhouse Gas Reduction

- Modo owned vehicles have been more fuel efficient than COV owned passenger vehicles since the inception of the Corporate Carshare program. This efficiency is due to the Modo fleet being both newer and containing more efficient more efficient vehicles per their class than the COV owned vehicles. In addition, Modo is contractually obligated to preferentially place award-winning, fuel efficient vehicles at City lots.
- In 2017, Modo vehicles used for business by COV employees emitted 24% less GHGs per km than their City owned counterparts, even when including the fleet's four electric vehicles. When not including the City's electric vehicles, Modo vehicles are 28% more efficient than all other COV fleet vehicles.

- Modo vehicles have consistently become more efficient. Since 2014, Modo vehicles have emitted less emissions per km every year, a result of Modo investing in a newer and more fuel efficient fleet. The four electric vehicles recently added to the COV carshare fleet have led to an increase in total fleet efficiency since 2016. However, this is balanced out by aging vehicles in the fleet, which depreciate in efficiency and have worse gasoline mileage than newer cars of the same class.

Community Benefits: Survey Results

- From June 27 to July 13, 2018, survey responses were collected from members of the Corporate Carshare Program. 276 out of 629 active program members responded, a 44% response rate. Given the population and sample size, answers to this survey have a 4% margin of error at a 95% confidence level. The survey explored program member travel habits, program impacts, and other community benefits of the program. The survey was distributed electronically to members of the Corporate Carshare program.
- The Corporate Carshare Program had a positive impact on member knowledge and attitude towards engaging with more sustainable transportation practices. The program introduced carsharing as a new concept to 21.2% of surveyed respondents. 48.2% of respondents either somewhat or strongly agreed that “the CoV carshare program has made me more aware of my personal travel choices,” with only 23.5% somewhat or strongly disagreeing, in those cases generally due to prior knowledge of sustainable transportation. Respondents also confirmed that joining the program made them more likely to recommend carsharing to a friend, family member, or associate, with 51.3% of respondents somewhat or strongly agreeing versus 14.9% somewhat or strongly disagreeing.
- Members reported more sustainable travel patterns, both for business travel and commuting to work, after joining the Carshare Program. After joining the program, 56% of respondents changed their primary mode of business travel and 54% changed their secondary mode of business travel. Meanwhile 20% respondents changed their primary mode of commuting to work while 25% changed their secondary mode of commuting. Respondents reported changing to more sustainable travel modes after joining Corporate Carshare. In addition to using carshare more often, employees reported switching to walking and biking for primary and secondary modes of transportation, supporting the understanding that carsharing enables other access to other forms of transportation..

Community Benefits: Increased Public Access to Carshare

- Over the course of the Corporate Carshare program, the City of Vancouver has requested Modo to place cars at five strategic locations to support business operations. Two recently added locations, Marine Gateway and Emergency Communications for British Columbia Incorporated (EComm), show clear growth in public carshare usage as a result of Modo adding more cars at the request of the City.
- Localized gaps exist throughout Vancouver with essentially zero carsharing utilization, implying a segment of the population without access to carsharing. The City of Vancouver can incentivize Modo to add vehicles to these locations, enabling more equitable access to a sustainable form of transportation.

COV Fleet Analysis

- The sixteen COV fleet vehicles included in the Corporate Carsharing Program were individually analyzed by cost per km and utilization rates (percent of time booked). These parameters were compared with the vehicle make and model and vehicle location.
- Recommendations were given to relocate certain vehicles to higher utilization locations, remove or replace fleet vehicles that have been consistently expensive to operate, develop education that encourages employee use of fleet electric vehicles, and investigate other surprising findings.

Conclusions

- The Corporate Carsharing Program enables employees to commute more sustainably to work. Employees who did not belong to a department with a dedicated vehicle would previously need to drive their private vehicle to work for business-related travel. These employees can now carshare, allowing them to commute via a more sustainable mode of transportation, such as walking, biking, or public transit.
- The costs of Corporate Carshare are similar to the costs allowing employees to travel in departmentally assigned vehicles on a department-to-department basis. Corporate Carshare may be more financially advantageous than this analysis suggests, since it is difficult to calculate all savings, including vehicles not added to City fleets, due to the program.
- Modo owned vehicles have been more fuel efficient than COV owned passenger vehicles since the inception of the Corporate Carshare program. Modo vehicles used for business by COV employees emitted 24% less GHGs per km than their City owned counterparts.
- The Corporate Carshare Program has had a positive impact on member knowledge and attitude towards engaging with more sustainable transportation practices. After joining the program, a large percentage of program members changed their primary transportation choices, both for commuting to work and business travel, from driving a private vehicle to walking, biking, public transit, or carshare.
- By incentivizing Modo to add vehicles in strategic locations, Corporate Carshare has helped grow public carsharing in Vancouver and enabled more equitable access to a sustainable form of transportation.