

Electric Mobility Strategy for Burlington

Community and Stakeholder Engagement Report



Table of Contents

Purpose	pg. 3
A. Community Survey	pg. 3
1. Plug-in Electric Vehicle Survey Analysis	pg. 4
I. Results at a Glance	pg. 4
II. Plug-in Electric Vehicle Ownership Experience	pg. 10
III. Understanding Barriers and Opportunities to Higher Electric Vehicle Adoption	pg. 13
IV. Charging Behaviour and Preferences	pg. 18
V. Role of the Government and Role of the Community	pg. 19
VI. Survey Comments	pg. 21
2. Electric Bike Survey Analysis	pg. 25
I. Results at a Glance	pg. 25
II. Electric Bike Ownership Experience	pg. 27
III. Understanding Barriers and Opportunities to Higher Electric Bike Adoption	pg. 30
IV. Survey Comments	pg. 32
3. Electric Scooter Survey Analysis	pg. 34
I. Results at a Glance	pg. 34
II. Electric Scooter Ownership Experience	pg. 36
III. Understanding Barriers and Opportunities to Higher Electric Scooter Adoption	pg. 39
IV. Survey Comments	pg. 41
B. MEET Burlington with Plug n Drive	pg. 43
C. Stakeholder Feedback	pg. 44
D. Feedback on the Electric Mobility Strategy Draft Actions	pg. 50
List of Figures	pg. 61

Purpose:

The development of the Electric Mobility Strategy for Burlington was informed and guided by community and stakeholder feedback. Community engagement opportunities included:

- A. A Community Survey
- B. Burlington MEET event with Plug n Drive
- C. Feedback on the Electric Mobility Strategy Draft Actions

This report summarizes the key insights from the community engagement efforts carried out at different stages of the strategy development process.

A. Community Survey

Purpose: to understand the barriers and opportunities to increasing electric mobility adoption in Burlington, three different surveys on electric vehicles, electric bikes, and electric scooters were posted online.

Duration: the surveys were available between March 10th and March 31st, 2022.

Availability and distribution: the surveys were hosted on the [Get Involved Burlington platform](#). The surveys were promoted on the City's social media channels and newsletter, as well as BurlingtonGreen's website, newsletter and social media channels. Additionally, some community partners promoted the surveys through their own social media channels.

Number of responses received: The plug-in electric vehicle survey received 382 responses, the electric bike survey received 164 responses and the electric scooter survey received 119 responses.

1. Plug-in Electric Vehicle Survey Analysis

Main findings:

- Benefits to the environment was the leading reason for purchasing or leasing a plug-in electric vehicle among survey respondents and one of the top reasons respondents who do not currently own or lease a plug-in electric vehicle may consider purchasing or leasing one.
- The majority of survey respondents who own or lease a plug-in electric vehicle charge at home.
- The price of plug-in electric vehicles and access to charging are barriers to higher adoption.
- An overwhelming majority of current plug-in electric vehicle drivers would recommend one to a friend or family member.

I. Results at a Glance:

- a. Plug-in electric vehicle ownership:** 26.3% of respondents currently lease or own a plug-in electric vehicle or have in the past. Mapping of respondents' postal codes show a fairly equal distribution of electric vehicle ownership across urban Burlington.

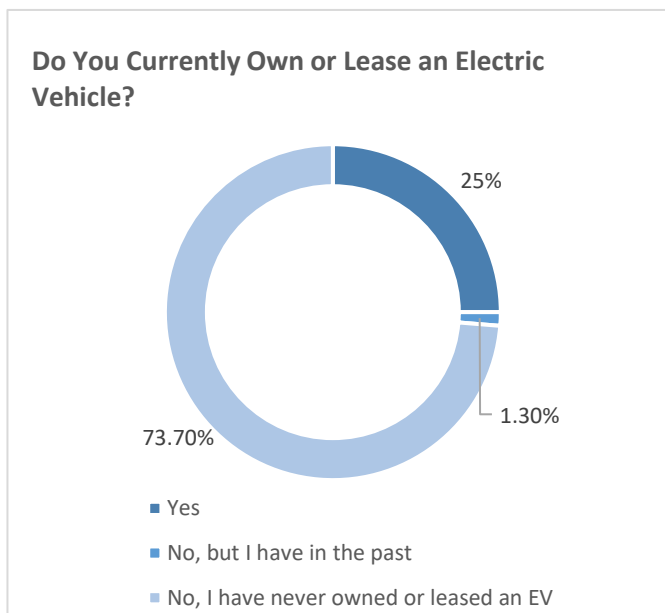


Fig. 1: Do you currently lease or own a plug-in electric vehicle? (380 responses)

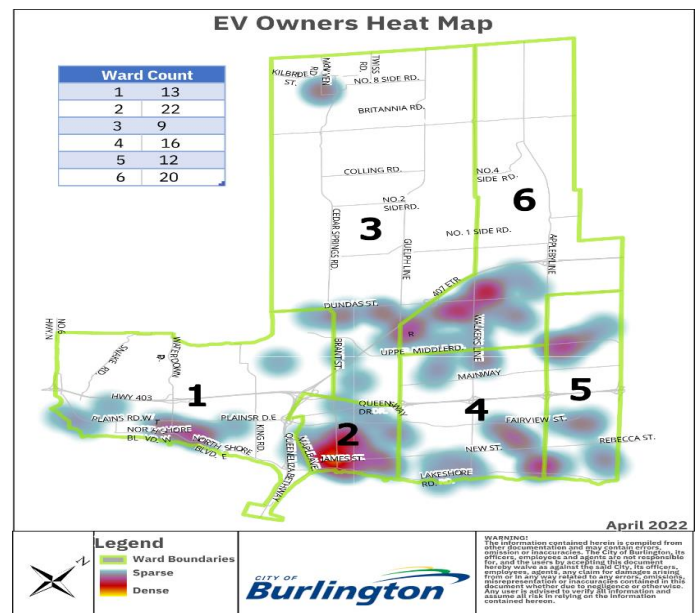


Fig. 2: Distribution of EV ownership in ownership in Burlington

b. Housing Type: 84.7% of respondents live in a single detached house, a semi detached house or a row/townhouse versus 15% of respondents who live in an apartment/condo building.

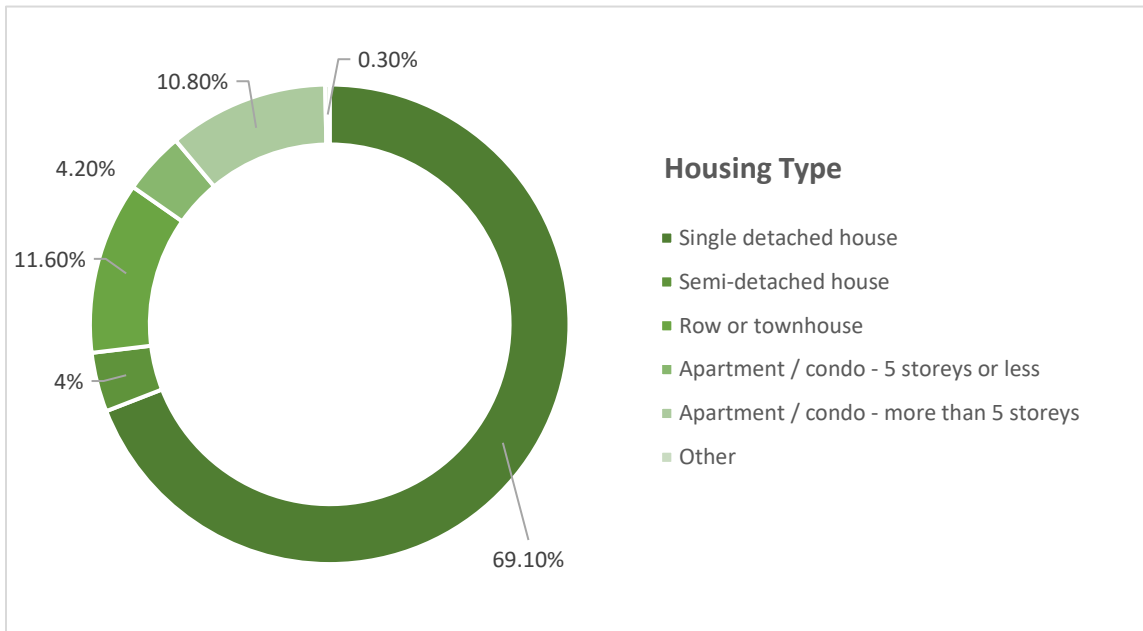


Fig. 3: What type of home do you live in? (379 responses)

c. Age range: 64.4% of survey respondents are between the age of 45 and 74.

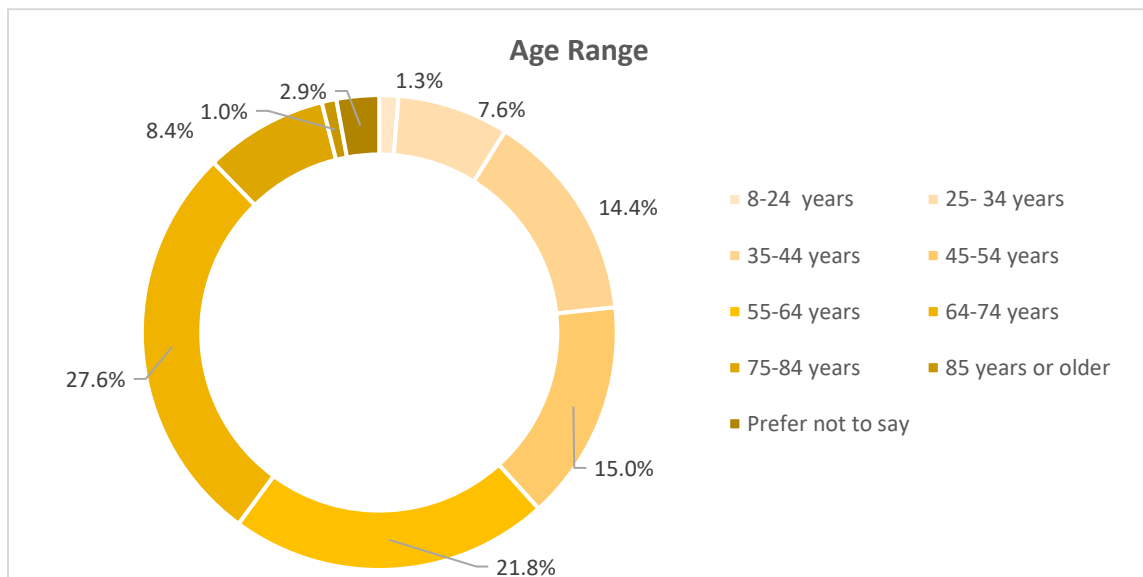


Fig. 4: What is your age range? (381 responses)

d. Average household income: 51.7% of survey respondents indicated an annual household income of \$100,000 or higher.

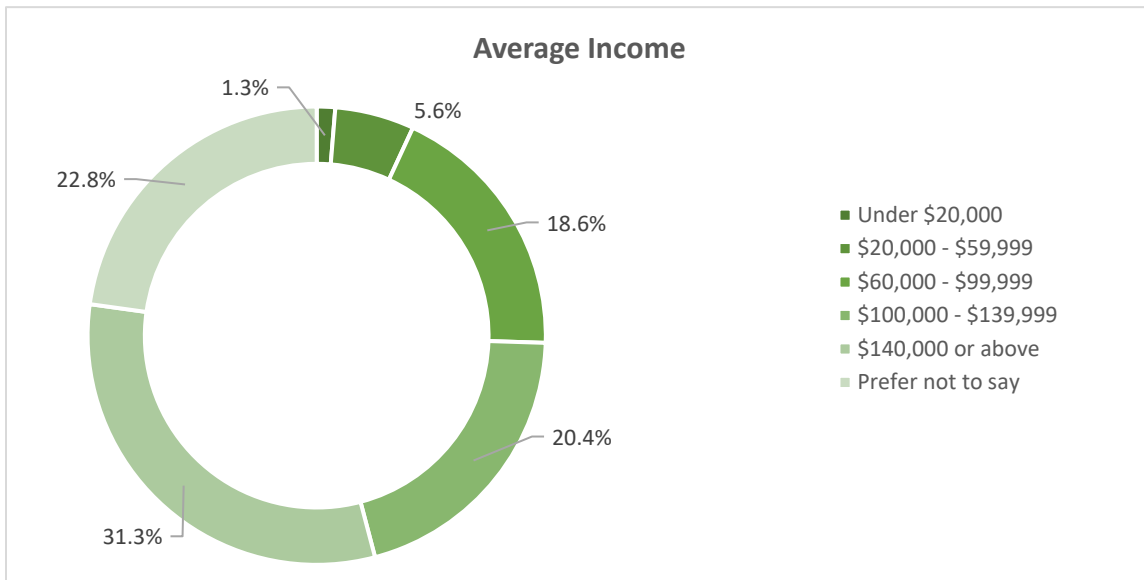


Fig. 5: Which of the following best describes your total household income last year, before taxes, from all sources for all household members? (377 responses)

e. Average daily driving distance: 76.1% of respondents drive 40 km or less on average per day.

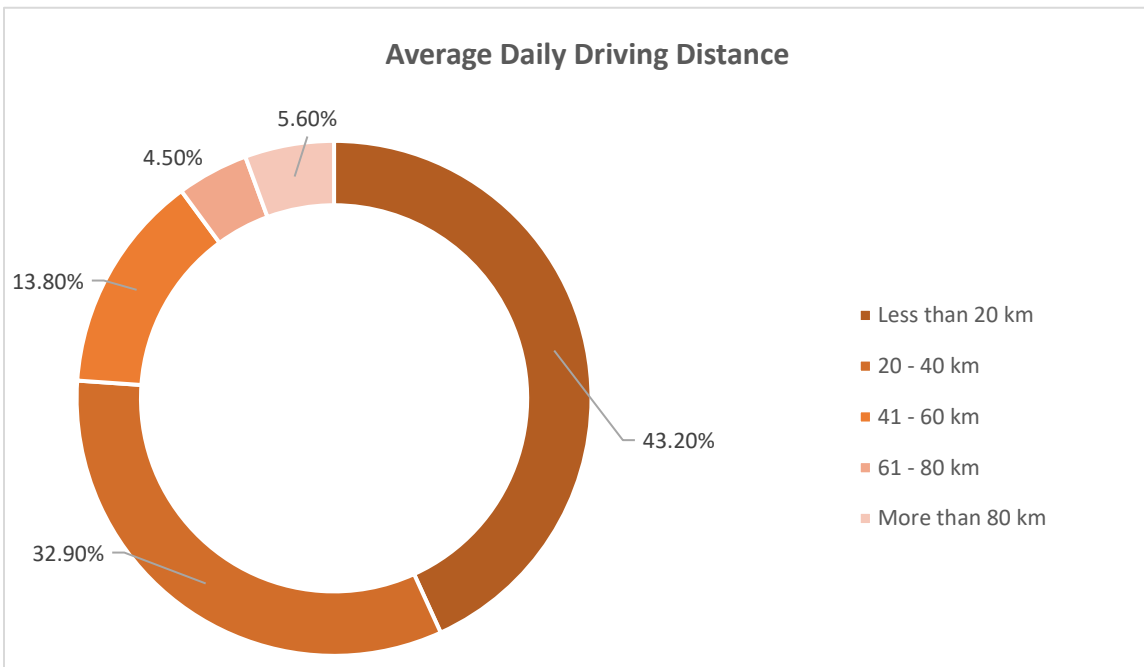


Fig. 6: Approximately how much do you drive every day? (377 responses)

f. Fuel Economy: 75% of respondents indicated that fuel economy is “extremely important” or “very important” to them when considering what vehicle to purchase or lease.

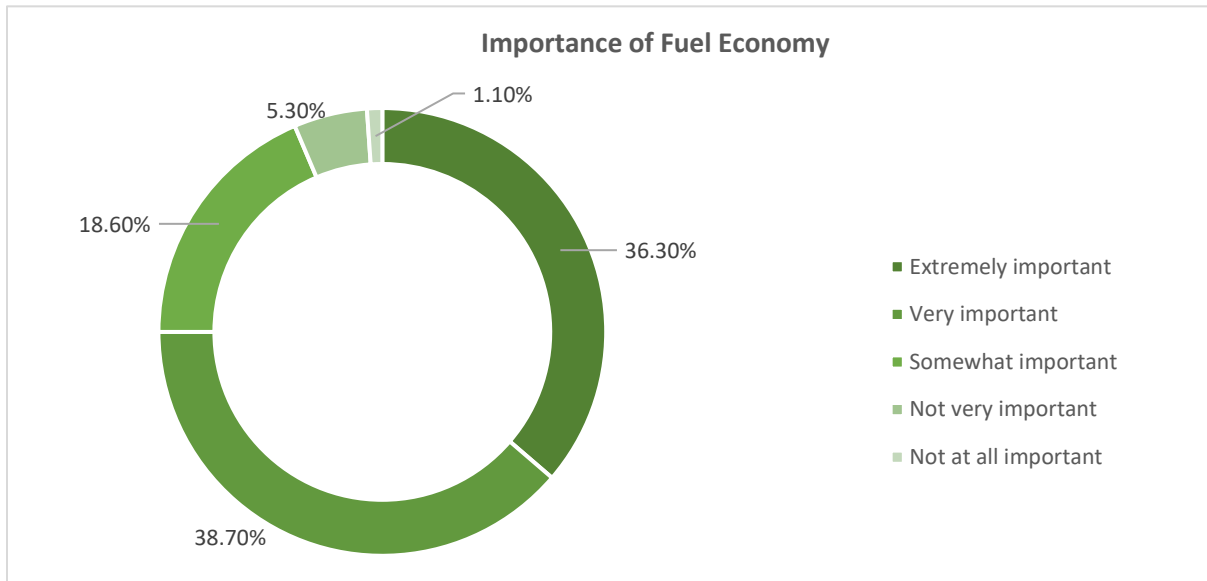


Fig. 7: How important is fuel economy to you when considering what vehicle to purchase or lease? (377 responses)

g. Electric vehicle knowledge and perceptions: 100% of respondents have some degree of knowledge of plug-in electric vehicles.

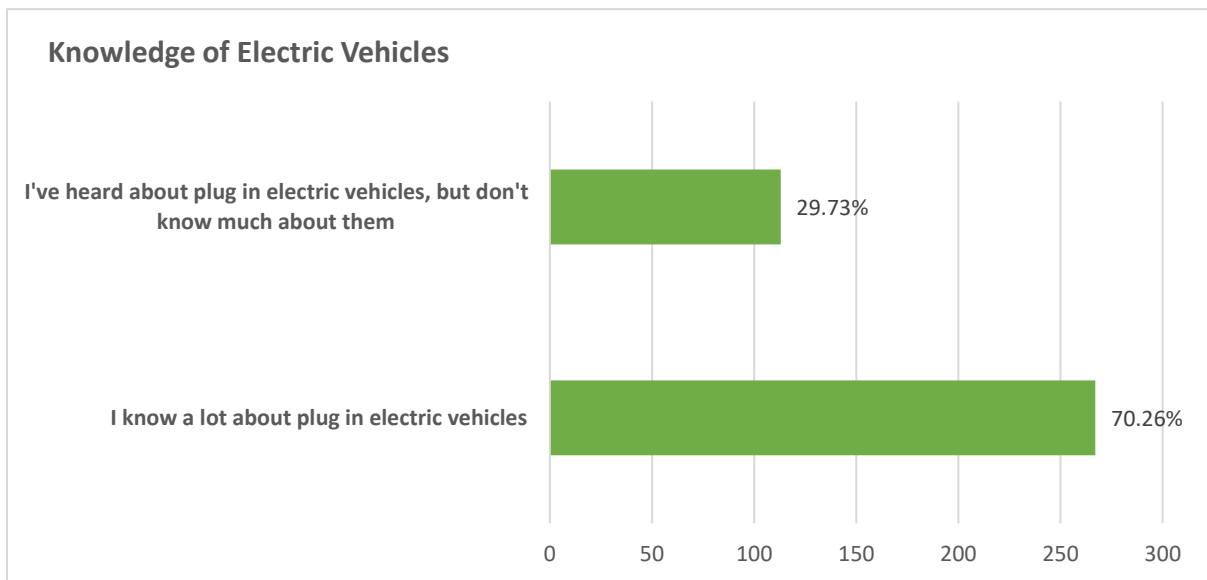


Fig. 8: Which of the following describes your knowledge of plug-in electric vehicles? (380 responses)

h. Plug-in electric vehicle experiences: The most common experiences respondents had with plug-in electric vehicles are:

- Seen a public charging station for plug-in electric vehicles
- Seen a plug-in electric vehicle in the neighbourhood
- Know someone who owned a plug-in electric vehicle
- Seen an ad for plug-in electric vehicles

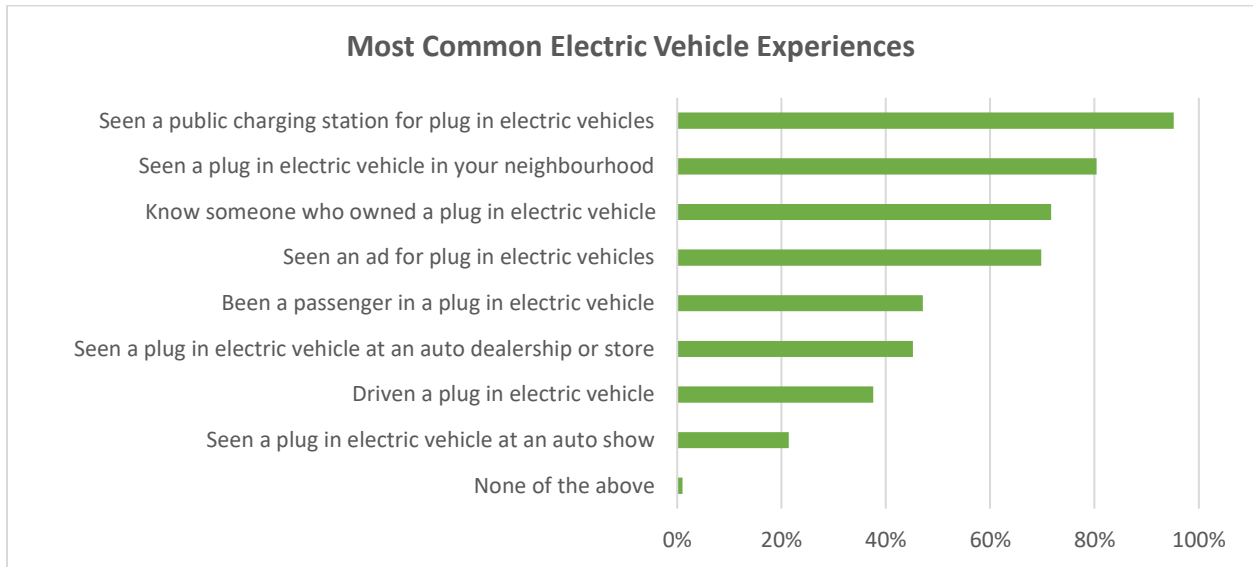


Fig. 9: Which of the following have you experienced? Check all that apply (378 responses)

i. Effect of the pandemic on the decision to purchase or lease a vehicle: The pandemic does not seem to have a large effect on respondents’ decision to purchase or lease a vehicle, nor what vehicle to get and when to get it, with 83.6% of respondents indicating that the pandemic has not impacted their decision.

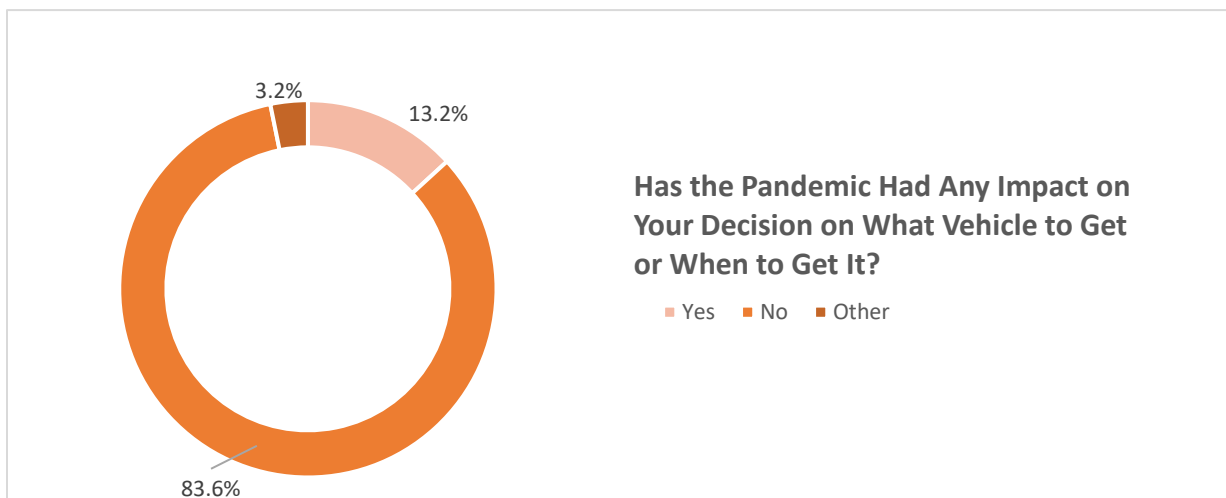


Fig. 10: Has the pandemic had any impact on your decision to what vehicle to get or when to get it? (378 responses)

The top impacts of the pandemic on vehicle purchasing or lease decisions are:

- delaying the decision
- choosing a different vehicle to purchase or lease to save money
- choosing a different vehicle to purchase or lease because of an anticipated decrease in driving distances.

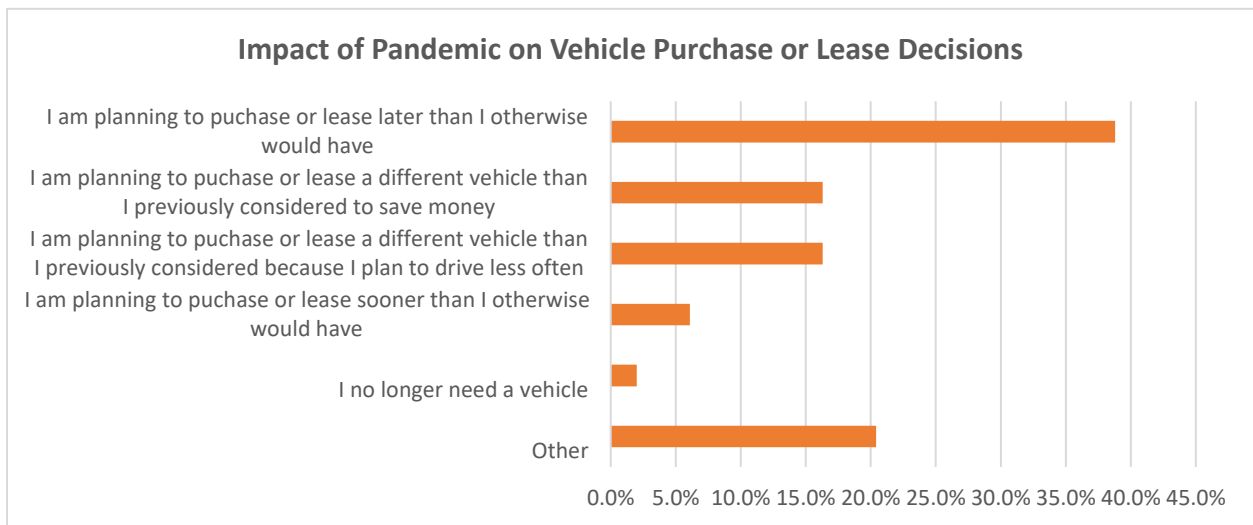


Fig. 11: If yes, how? (49 responses)

Other comments about the impacts of the pandemic on vehicle purchase or lease considerations include:

Other comments about the impacts of the pandemic on vehicle purchase or lease considerations include:
“We went down to one vehicle during the pandemic. Our second vehicle died, and we decided not to replace it since my husband was no longer commuting.”
“Supply chain issues have reduced availability and increased price.”
“Retired. Just bought a fairly low gas consumption small new car.”

II. Plug-in Electric Vehicle Ownership Experience:

a. Satisfaction: 100% of respondents are satisfied with their plug-in electric vehicle, with 14.7% indicating that they are “very satisfied”.

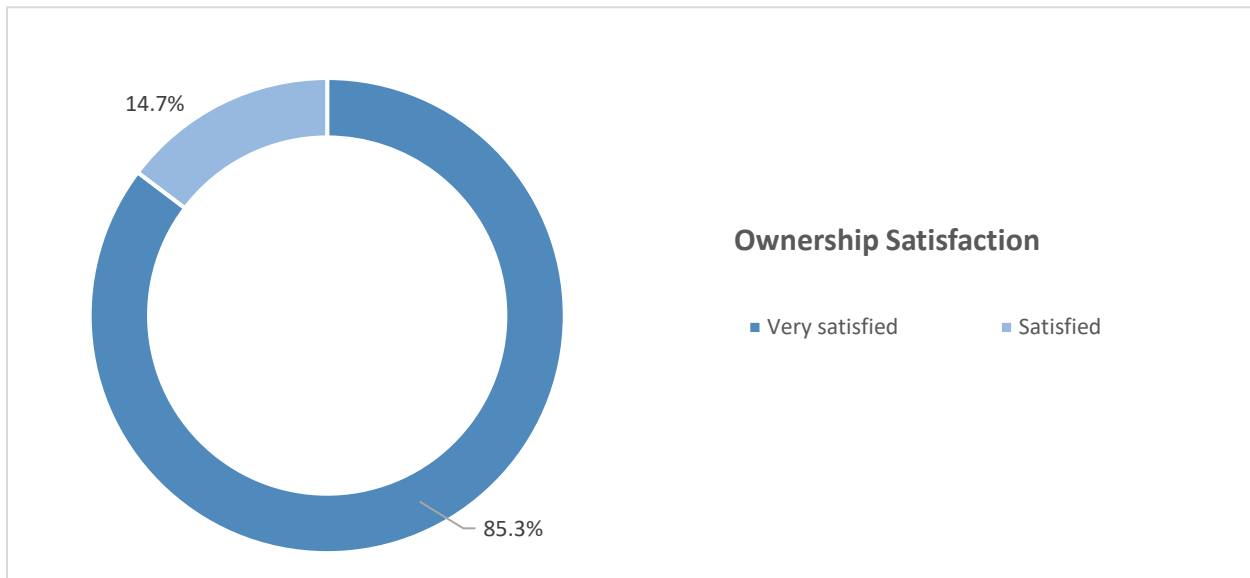


Fig. 12: How satisfied are you with your plug-in electric vehicle? (95 responses)

b. Range and driving distance: 49.6% of plug-in electric vehicle drivers indicated that their battery range is between 300 km – 499 km, and 82% of them drive less than 60 km on average per day.

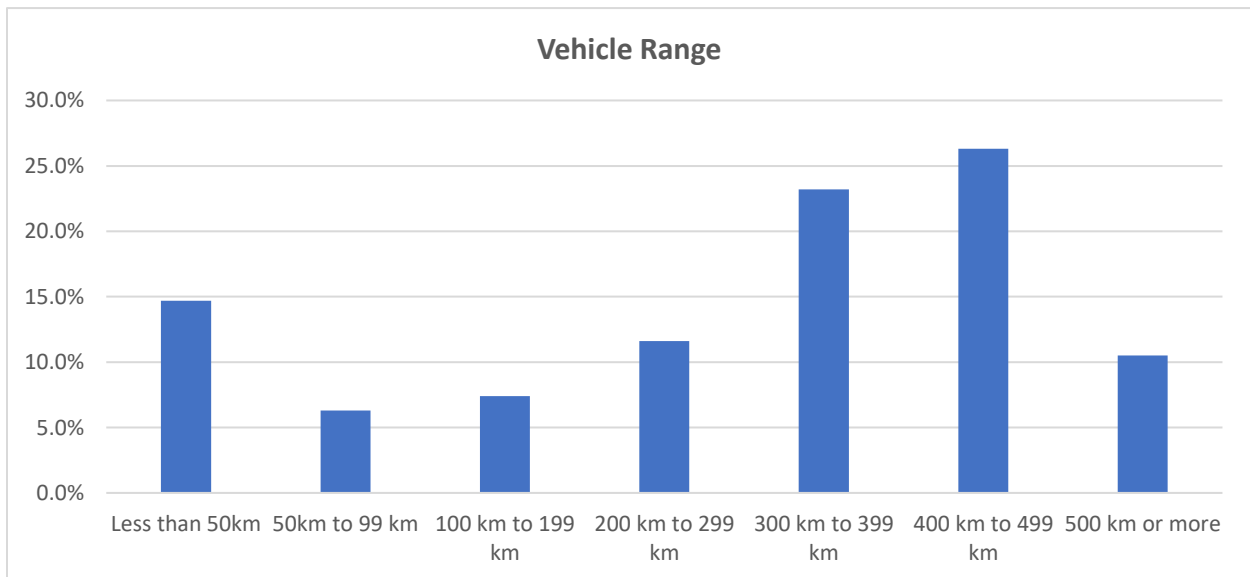
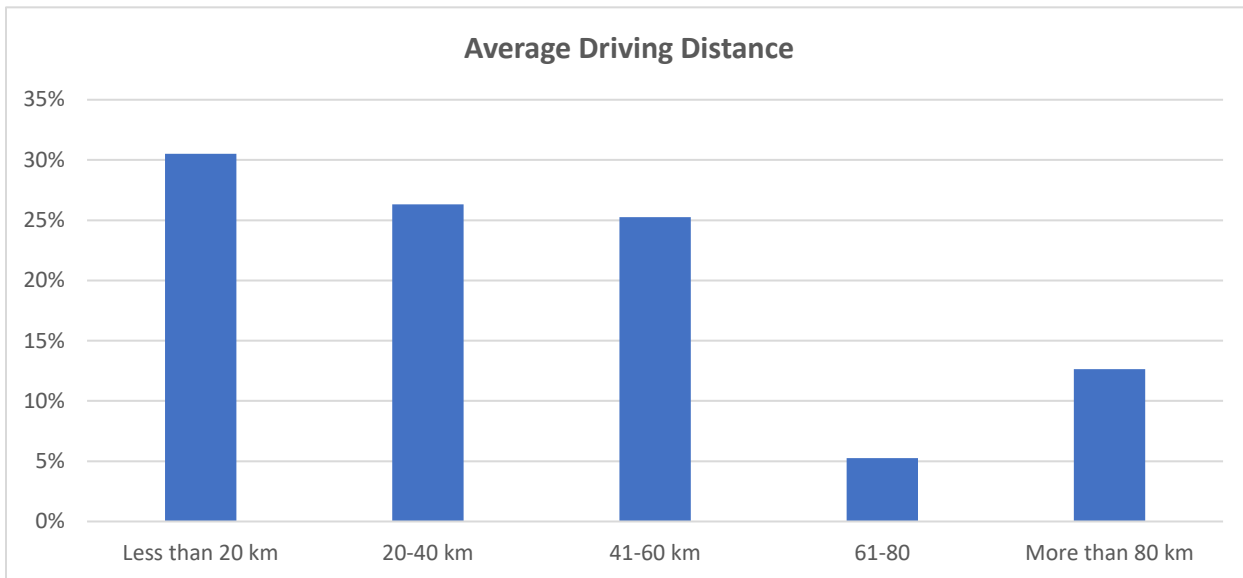
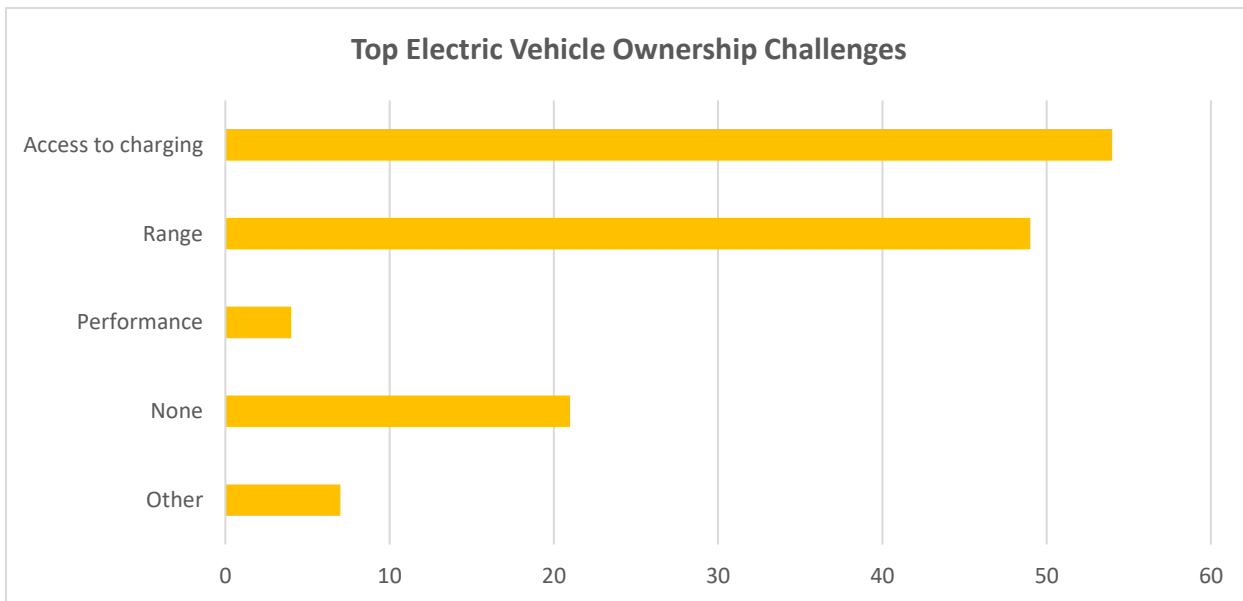


Fig. 13: What is the range of your plug-in electric vehicle? (95 responses)



Q: Approximately how much do you drive every day? (95 responses)

c. Top ownership challenges: Access to charging and range were the top plug in electric vehicle ownership challenges.



Q: What are the top plug in electric vehicle ownership challenges you face? Check all that apply (95 respondents)

Other comments on ownership challenges included:
“Range, only if planning a long trip (400 km +).”
“Battery degradation during winter months is a hassle as you will use range with your battery.”

“Adjustment to new way of thinking about my vehicle, new routines and distance trip planning.”

“Access to charging only (partly) becomes an issue when travelling long distances. We installed an EV charger within our garage, which is more than enough to meet daily needs for driving around Burlington and GTA.”

“Total unreliability of public charging stations, they work only about 2/3 of the time, even after checking user experience on PlugShare. If filling up gas would be that difficult, there wouldn't be any cars on the road.”

“Charging networks locking in with apps and required membership, some networks are impossible to use without a reliable cell phone connection, which can be a problem and even if with a connection, they are a pain in bad weather. Charging stations should be mandated to offer credit and debit card payments, like gas stations.”

d. Encouraging attributes: Less impact on the environment was the top motivator for survey respondents to purchase or lease a plug in electric vehicle. Costing less to charge than fuelling a gas powered vehicle and lower maintenance costs were also among the top favourable plug in electric vehicle attributes.

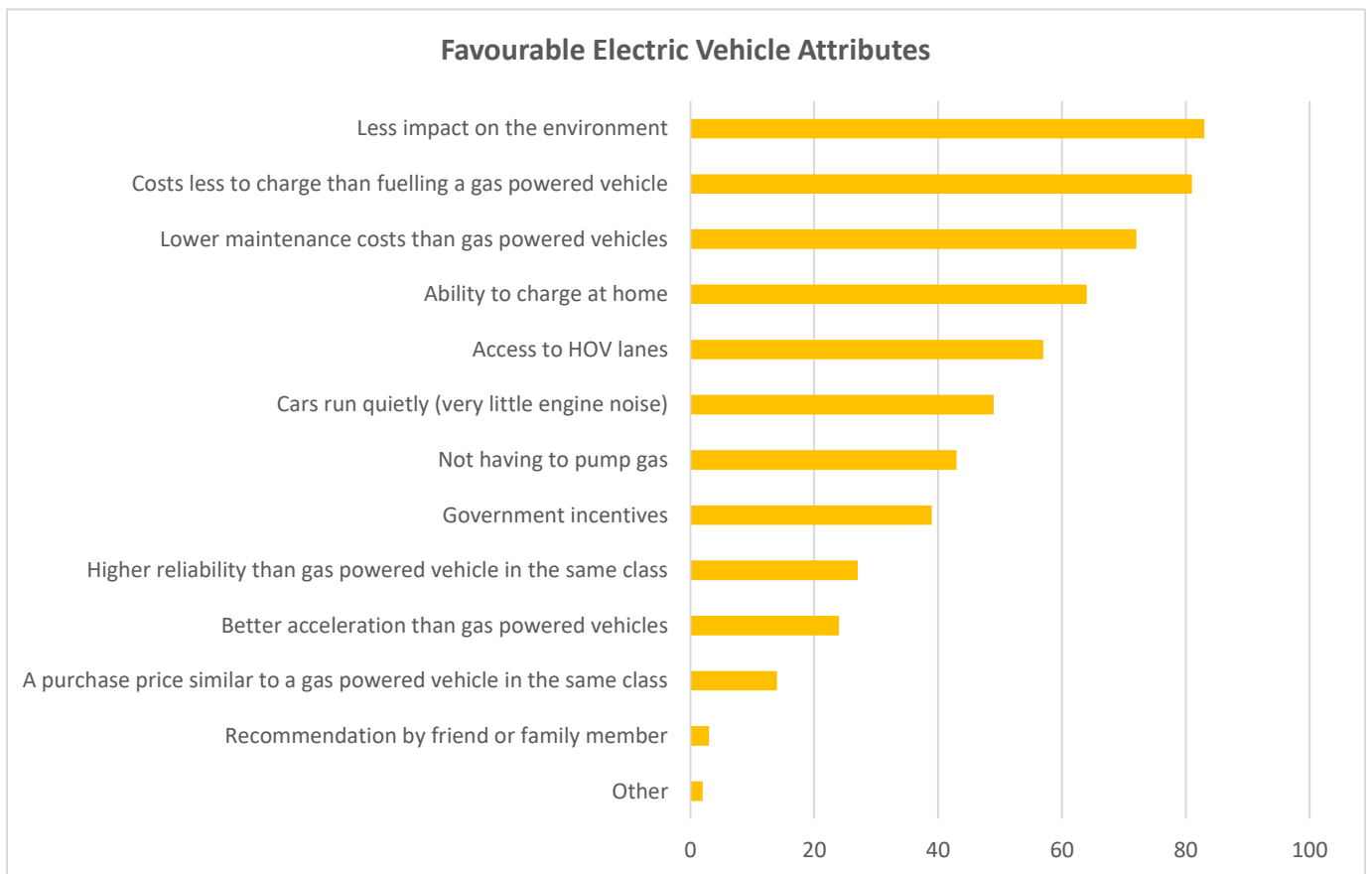


Fig. 16: Which of the following attributes (if any) encouraged you to purchase / lease a plug-in electric vehicle? (95 responses)

e. Overall vehicle satisfaction: An overwhelming majority of respondents (99%) would recommend a plug-in electric vehicle to a friend or family member.

III. Understanding Barriers and Opportunities to Higher Electric Vehicle Adoption:

a. Attributes that would encourage the purchase of a plug-in electric vehicle:

Costing less to charge than fuelling a gas powered vehicle, benefits to the environment and a purchase price similar to a gas powered vehicle in the same class were the top attributes that would encourage non plug-in electric vehicle owners to purchase one.

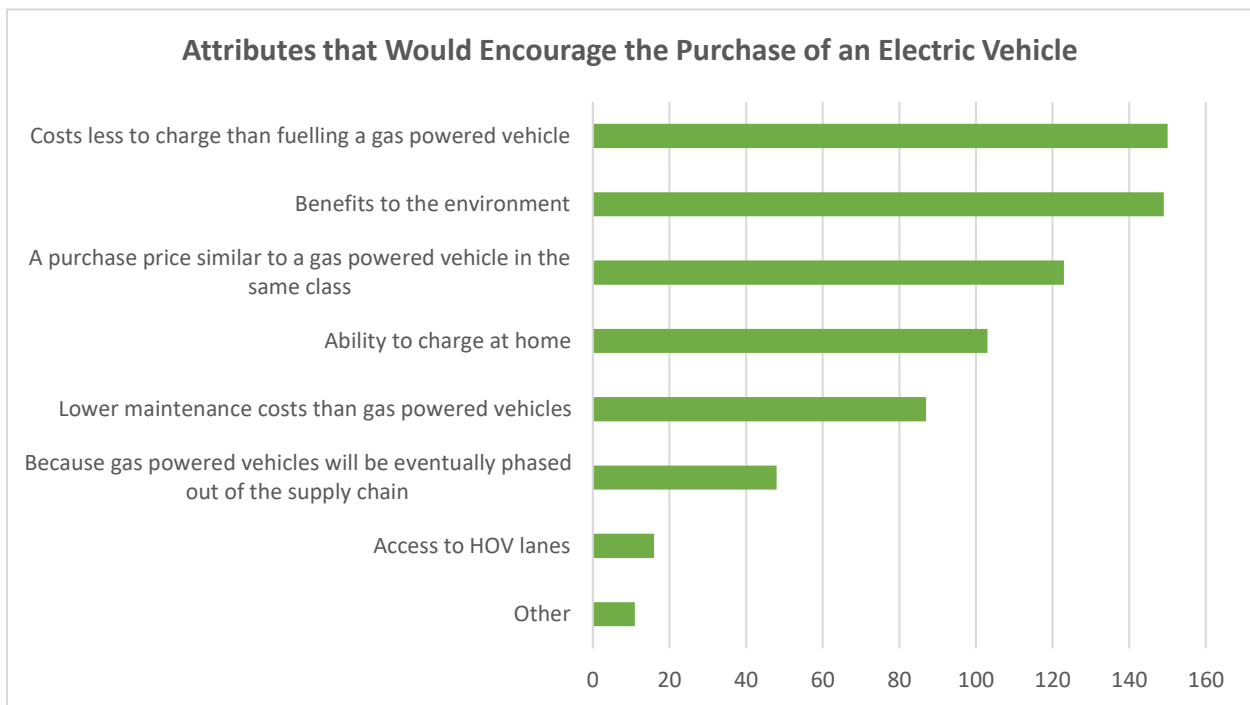


Fig. 17: Which of the following attributes (if any) would most encourage you to purchase a plug-in electric vehicle? Select up to 3 choices. (248 responses)

Other comments about attributes to encourage the purchase of a plug-in electric vehicle included:

“The total cost of ownership is similar or less than a gasoline power car with the same level of features and performance.”

“Plug-in options in condo/apartments.”

“Need to have increased range as we have family in Montreal and need to be able to visit them on one charge. Electric vehicles have limited range, especially in colder weather.”
“Local electric vehicle charging stations at all Canada Post locations, Drug Store locations, Malls of all sizes. Infrastructure needs to be there to get to destinations and home.”
“Has the same capability (e.g., towing), refueling/charging time, and same distance travelled on a charge/tank.”
“Government incentives with purchase or with at home charging infrastructure.”
“Ability to charge at the cottage.”
“Availability of charging stations: it has to be as easy to recharge as it is to fill up at any gas station.”
“There needs to be a standard charging receptacle. Just as gas nozzles are one-size-fits-all, so must charging ports.”
“The charging time must be similar to the time it takes to fill up a gas tank.”
“Batteries need to be replaceable and upgradeable. We cannot afford to get a new car as often as we get a new mobile phone just because the features have improved.”

b. Range: A battery range between 300 km to 500 km and above was the one deemed acceptable by the majority of respondents who do not currently drive a plug-in electric vehicle. This is consistent with the battery range of survey respondents who are current plug-in vehicle drivers.

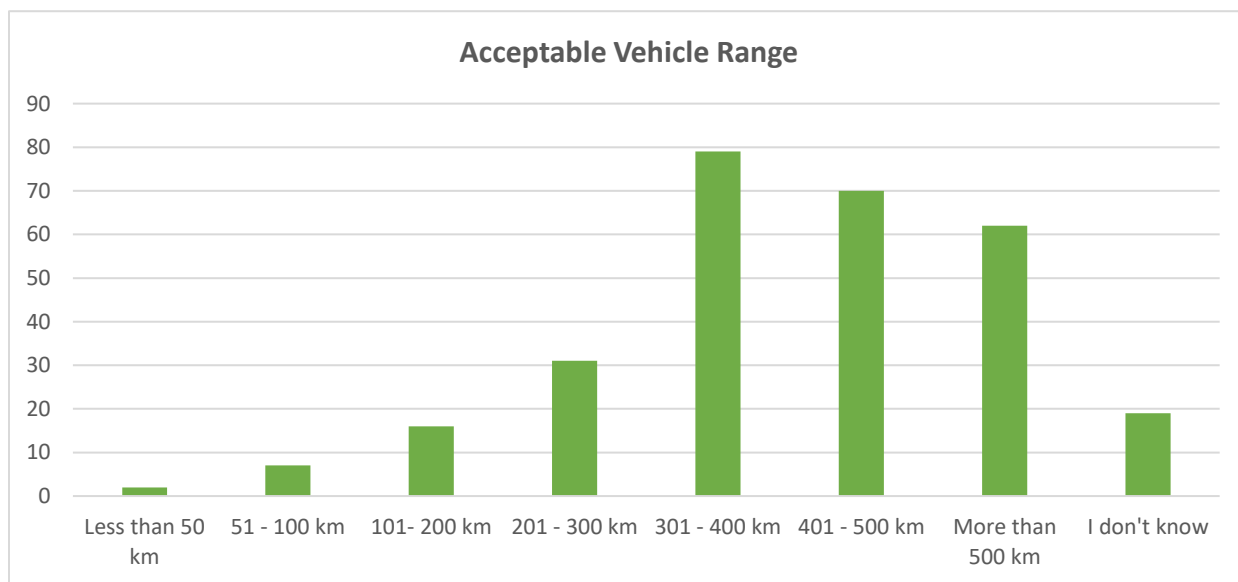


Fig. 18: What would an acceptable range for your plug-in electric vehicle be if you were to own or lease one in the future? (247 responses).

c. Government programs to support plug-in electric vehicles: Rebates at the time of purchase, discounts to install a home charging station and public charging stations along highways were the top 3 government programs that survey respondents who do not drive a plug-in electric vehicle indicated would increase their interest in purchasing or leasing one.

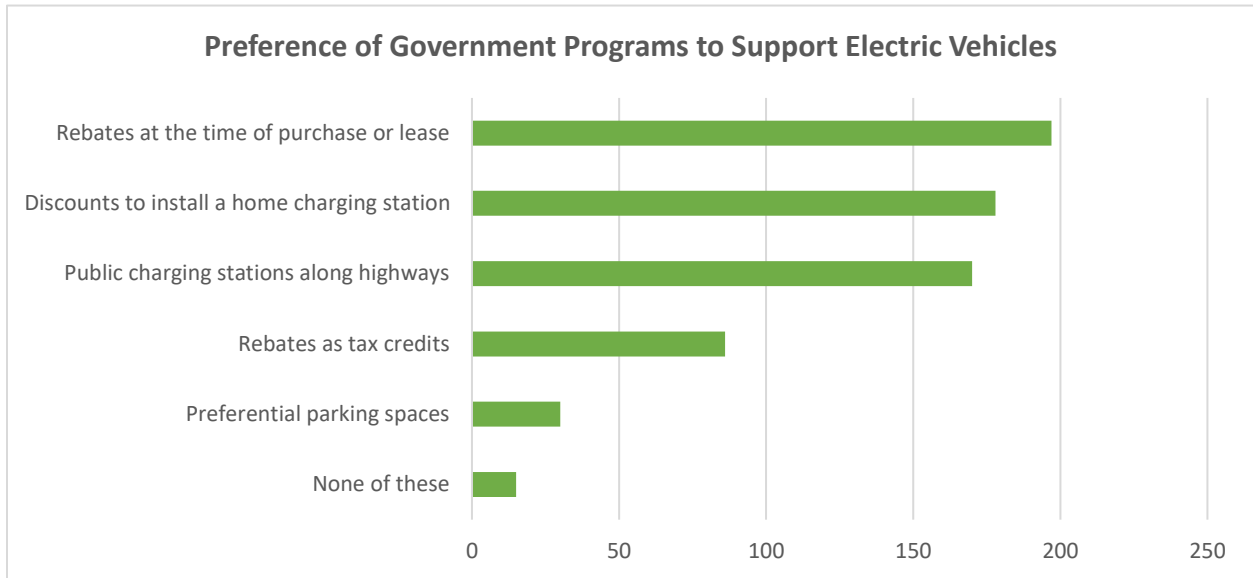


Fig. 19: Which government programs if enacted, would most likely increase your interest in purchasing or leasing a plug-in electric vehicle? Please select your top 3 choices. (246 responses)

d. Price range: 50% of survey respondents who do not drive a plug-in electric vehicle indicated that they would be willing to pay up to 10% for a plug-in electric vehicle with the same functionality as a gas car, and 24.2% are not willing to pay a higher price at all.

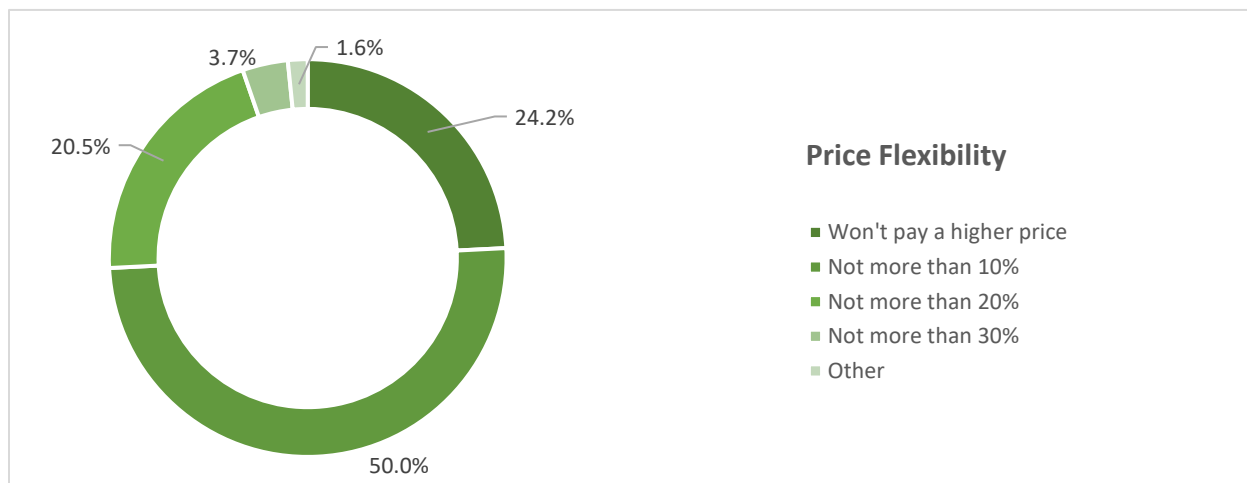


Fig. 20: How much (if any) are you willing to pay for a plug-in electric vehicle with more or less the same functionality as a gas powered vehicle? (244 responses)

Other comments about plug-in electric vehicle price ranges included:

“Not willing to buy a gasoline-powered car at all.”

“No more than 10% however need clarity that total cost of ownership is substantially lower and the cars must be great quality.”

e. What is holding survey respondents who do not drive a plug-in electric vehicle from using one? Purchase price, insufficient driving range and not enough public charging stations were the top reasons survey respondents who do not drive a plug-in electric vehicle were not purchasing or leasing one.

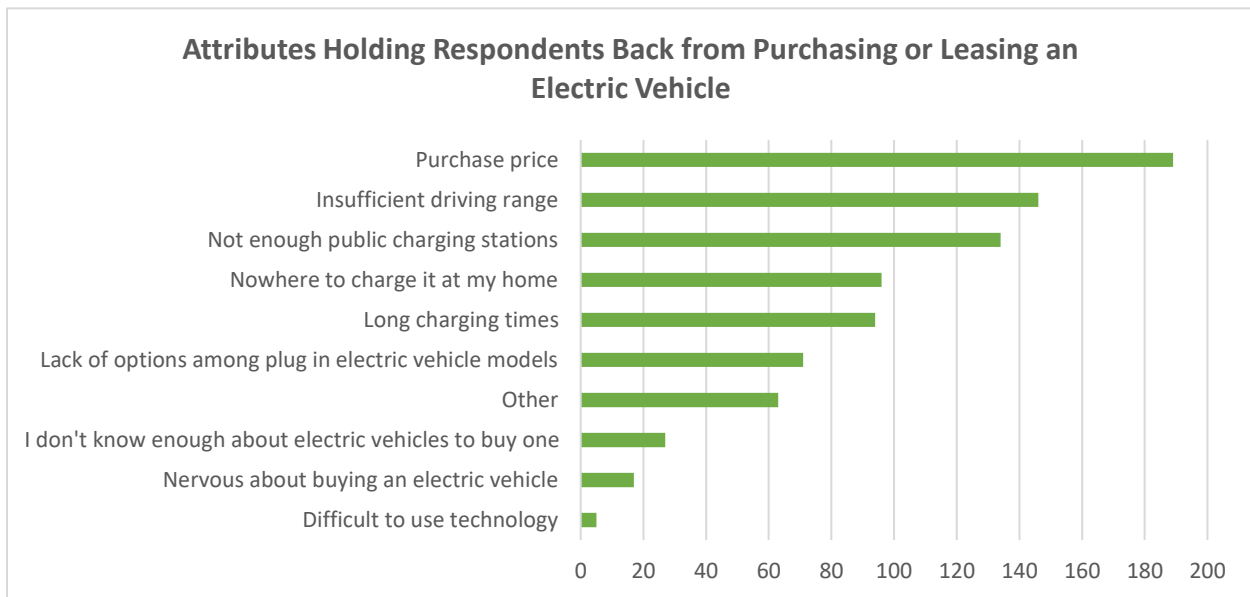


Fig. 21: Which of the following attributes, if any, are holding you back from purchasing or leasing a plug-in electric vehicle? Choose all that apply. (278 responses)

Other reasons included:

“With the cost of electricity also increasing nonstop, also worried about the ability to afford charging on a long term.”

“When my existing vehicle no longer meets my needs.”

“We buy cars that are at least 3 years old so that we don't suffer the first 3 years of depreciation of a new car. When I evaluate cars in this category, the total cost of ownership of an electric car is far more than a gas car.”

“Very little information re the availability or cost of replacement batteries. Data on the ease and effectiveness of the disposal of old batteries, parts etc. the percentage of recyclable parts versus disposal etc.”

“No history on the value of used electric vehicles, or the long term costs of ownership.”

“Trying to be less auto dependant, would rather walk, transit or cycle. Would be nice to sell my car.”

“To drive across Ontario or QC or into the states would require a lot of planning and calculations so we know where all the charging stations are. With gas there will always be a gas station along the way, filling up and snacks takes 10 mins.”
“My home needs an electrical overhaul. We still have 80amps service and fuses. Our whole house needs an upgrade since nothing much has been done to it since it was built in 1954.”
“My appt building has no place to plug-in.”
“Being a home renter.”
“What will happen if there are extended power outages (e.g., major ice storm)?”
“Technology seems fairly new; too many issues still to be resolved.”
“Prefer a Hybrid or possibly a Plug-In Hybrid.”
“Not enough supply. Wait lists to purchase EV's are ridiculously long.”
“Longevity, repair costs, sustainability, and how will this impact the grid if everyone move to electric?”
“I like the sound of a real engine.”
“Hackable software, the ability to remotely disable vehicle.”

f. Thoughts on buying or leasing a plug-in electric vehicle: 69.2% of survey respondents that do not drive a plug-in electric vehicle indicated that they are either “Definitely planning to get a plug-in electric vehicle” or “would consider getting a plug-in electric vehicle” as their next vehicle.

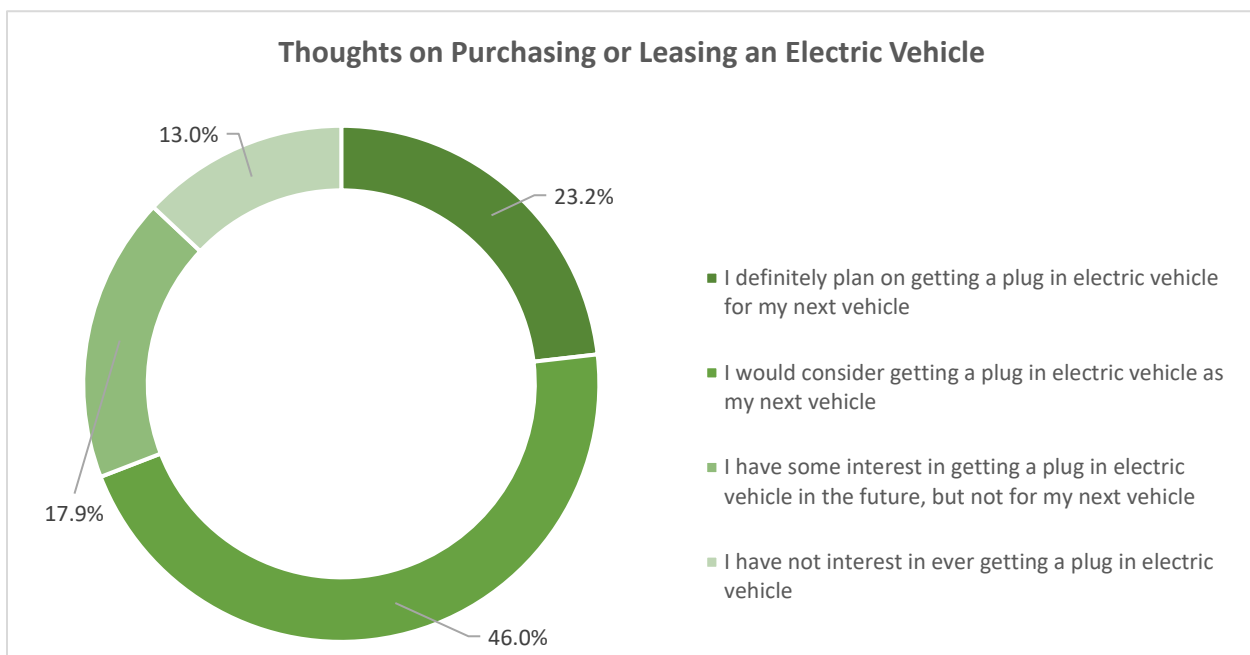


Fig. 22: Which statement best describes your thoughts on buying or leasing a plug-in electric vehicle? (285 responses)

IV. Charging Behaviour and Preferences:

a. Where are current plug-in electric vehicle drivers charging?

74.2% of plug-in electric vehicle drivers charge their plug-in electric vehicle at their homes.

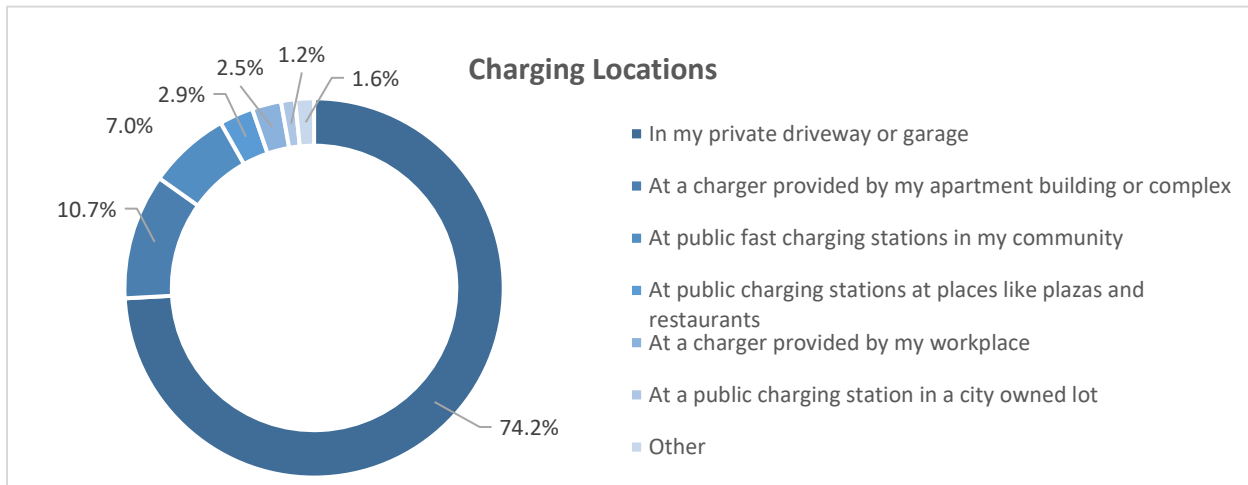


Fig. 23: Where do you do most of your charging? (244 responses) *

b. Importance of a clean grid: 77.7% of survey respondents indicated that it is “very important” or “important” that the electricity used in a plug-in electric vehicle come from emissions free energy.

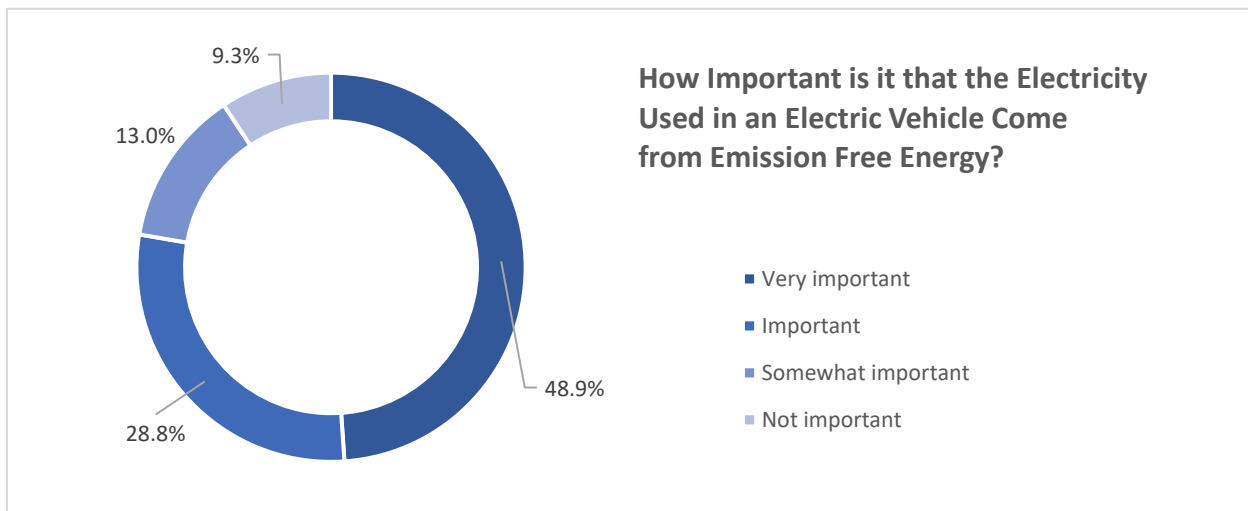


Fig. 24. How important is it that the electricity used in a plug-in electric vehicle come from emission free energy? (378 responses)

* Question updated to align with question logic.

V. Role of the Government and Role of the Community:

a. Trustworthy Sources of Information:

The City of Burlington is perceived as a trustworthy source of information by survey respondents, with more respondents indicating it is “very trustworthy” compared to other sources of information.

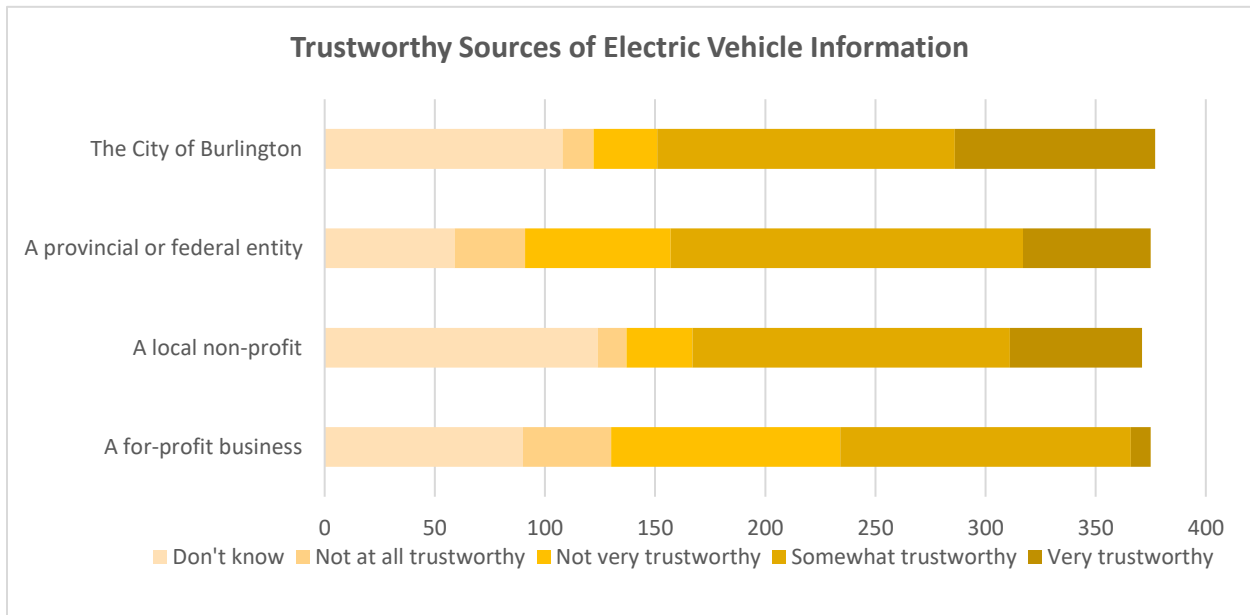


Fig. 25: How Trustworthy are the following sources of information on electric plug-in vehicle options / choices? (377 responses)

Other trustworthy sources of information included:
Studies concerning environmental impact of mining for the materials to make the batteries and disposal of the batteries.
Dealerships
Plug N Drive
Mechanics and car technicians.
Government websites.
Internet search.
Family and friends.
Current electric vehicle owners.
Professional and online auto reviews.
Newspapers and TV news.
Consumer reports.
Information classes and presentations.

Automobile Protection Association (APA)
Canadian Automobile Association (CAA)

b. How can different levels of government support higher uptake of plug-in electric vehicles?

Approximately 50% of survey respondents “strongly agree” that both the federal and provincial governments should invest money to increase the availability of electric charging stations. 58.8% of survey respondents “strongly agree” or “agree” that incentives and tax rebates for plug-in electric vehicles should be targeted towards low and moderate income consumers. Additionally, 75% of survey respondents “strongly agree” or “agree” that the City of Burlington is responsible for addressing climate change in its plans and programs.

On the other hand, 39% of survey respondents “strongly disagree” or “disagree” that electricity in Ontario is fairly priced.

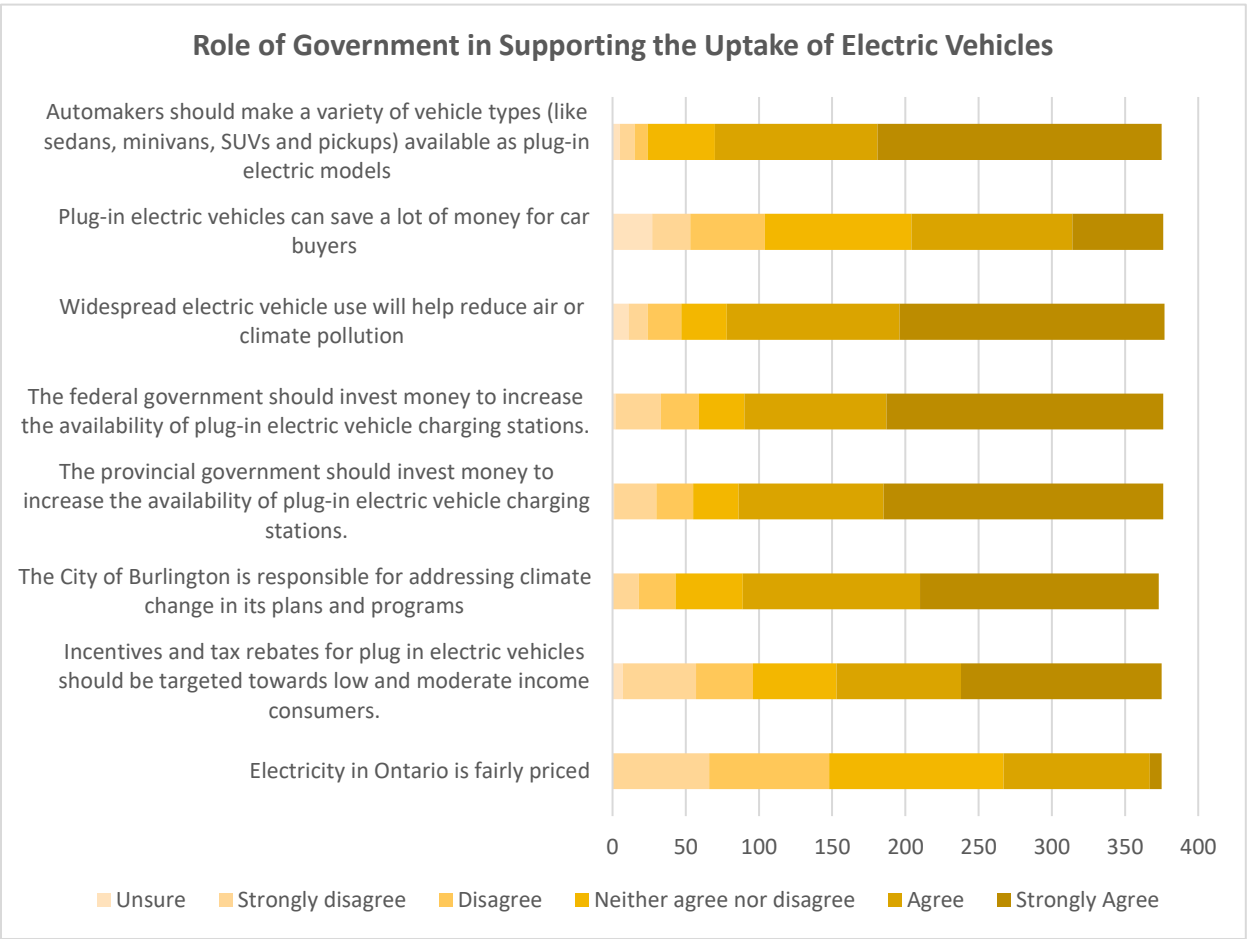


Fig. 26: Please indicate your level of agreement with the following statements (377 responses)

c. What is the role of community members in fighting climate change?

67.3% of survey respondents “strongly agree” or “agree” that they have the power to make an impact against climate change, and 52.7% of survey respondents “strongly agree” or “agree” that they want to help fight climate change, but it can’t cost them or their families too much money.

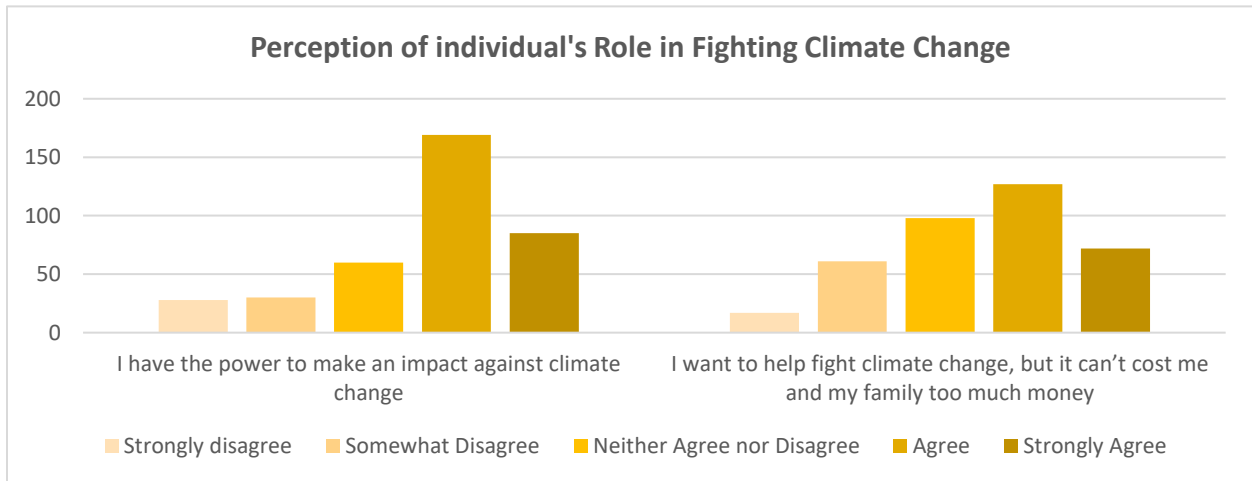


Fig. 27: Please indicate your level of agreement with the following statements (377 responses)

VI. Survey Comments:

157 plug-in electric vehicle survey respondents provided further comments and feedback.

Comments included:
Access to charging
“While most drivers while do the majority of their charging at home, it's crucial that the City/Province support public chargers so that the perception of available chargers positively influences EV uptake, and support longer distance trips e.g., people coming to Ikea from SW Ontario.”
“Until EVs can be recharged in minutes and there are as many charging stations as there are gas stations, I will not be interested in a full EV. I remain hopeful that the far better option of hydrogen powered vehicles becomes more viable.”

“Are there programs available to convert older apartment buildings with charge stations. I don't want to pay for other people's consumption if there's a public charger at my building. Chargers also need to be uniform, not proprietary per manufacturer.”

Accessibility and safety

“Standards need to be developed to create accessible (Electric Vehicle Charging Stations) EVCS and parking spaces because people with disabilities also need to charge their electric vehicles.”

“Roadway safety education and designing safer streets. I have heard that electric vehicles make less noise on the roadway than combustion engine vehicles. Some people who have attempted to cross a street have been startled or hit by an on-coming electric vehicle (car, bike) as they did not hear it approaching. Better cross walk designs must be implemented and education for motorists and pedestrians must be implemented to better prepare everyone for the increase in electric vehicles and how to be safe in roadway areas to avoid accidents.”

“It is important to take into consideration accessibility issues in terms of charging stations in public as well as private parking areas. For accessible parking spaces there needs to be at least 50% of the spaces with a charging station since accessible vans if they need to use the charging station are not able to fit into a regular parking space. Also, the plug-in mechanism needs to be low enough so that someone in a wheelchair can access the plug-in mechanism. Another issue with electric vehicles is that they are very quiet so someone who is blind will not be able to hear the vehicle on the street. and could walk right in front of an EV because they think there are no cars on the street. Electric vehicle manufacturers are beginning to think about this issue, but at this point in time, it creates a serious hazard for blind people (and the public in general, since we tend to rely on hearing a vehicle before we actually see it). The City of Burlington will need to address this issue.”

“If you are in a wheelchair, you can not plug the vehicle in.”

“Burlington’s EVs must include the mobility scooters that our handicapped and seniors must use on a regular basis to enjoy a barrier free community.”

“As a(n) amputee I have not found a charging station that I can get to in a wheelchair as they are not accessible. The parking space are all the same size, and a wheelchair is large and needs to be carried in a larger SUV and can not get in between the vehicles to get to the plug-ins. No ramps on the charging station when they are located at condo buildings. A(n) amputee can still drive missing one or both legs, but they cannot walk without help such as a wheelchair.”

Battery recycling

“We use petroleum for everything right now, certain things can be recycled and reused, now with electric what can be recycled and reused, we don’t know yet and what (effect) will it have on the environment, big questions on that.”

“Can the life cycle of the electric cars be "environmentally neutral" compared to gas-powered?”

<p>“Nobody wants to talk about what happens to these vehicles (and their batteries) at the end of their useful life.”</p>
<p>Power supply, grid capacity and a clean grid</p>
<p>“Yes, electric generation in Ontario and Canada should be GHG free i.e. nuclear as baseload and balance with renewals which don’t work at night or no wind conditions.”</p>
<p>“We do not have the infrastructure to power the number of EVs in Ontario. If everyone had an EV, we would have rolling black outs.”</p>
<p>“The following questions should be considered: Can our power generation and distribution system handle the influx of electric cars? Can the generation of that power be emission free?”</p>
<p>“Promote solar panels to charging locations to help in feeding the grid to keep costs down and private home and public use of panels.”</p>
<p>“Does the City of Burlington have the infrastructure and the available hydro capacity for every home and apartment to charge an electric vehicle?”</p>
<p>Price and affordability</p>
<p>“With the cost of living skyrocketing, gas/fuel, hydro, water, food, housing after Covid 19, and with a war, and many individuals only getting bare minimum increases in salaries, there is not much to be able to give, especially for households who may have experienced any parental leaves, or loss of jobs, helping extended family- retirees, etc. It just can't all keep coming back to the public to pay, a lot of us just can't do anymore. For the middle and lower class, it is not a question of frivolous spending, it is the day-to-day cost of living that is just getting too high.”</p>
<p>“The urgency to fight climate change requires affordable EV's that remove unnecessary bells and whistles, or that are provided as an optional feature. We need a basic EV that people can afford. I think of countries where they have released "plain" models of cars that have been affordable for people in mid to low incomes.”</p>
<p>Role of government and incentives</p>
<p>“Sooner the better. Try to influence province to re-engage in electric vehicles. With no provincial and federal support, little can be done at the local level.”</p>
<p>“Some sort of program/grant for renters or landlords to install charging infrastructure at their houses/buildings.”</p>
<p>“We looked into the cost of installing electric vehicle charging stations in my condo complex. It is way too expensive. There needs to be more incentives/rebates for condos and apartments to install the charging infrastructure, so residents have the option.”</p>
<p>“Property tax incentive to buy and install home fast chargers and plugin EVs.”</p>
<p>“One option not considered but should be in response to question 11 is to offer hydro bill incentives for time of use charging. Concerned that the PUC is not going to join in on incentivizing people but just charge more.”</p>
<p>“No tax when purchasing an EV.”</p>
<p>“Make costs known to buyers. I.e., cost to increase power supply to house, cost to install chargers, cost to charge etc.”</p>

<p>“I feel the City of Burlington should be putting fast charge stations at many of its public parking lots (arenas, recreation centres, Libraries). Burlington should also offer a financial incentive to businesses to put in charging stations. If we can create a culture where charging stations are easy access, more people will feel they can purchase an e-vehicle.”</p>
<p>“How does the province intend to make of for the loss of gasoline tax revenue? The elephant in the room.”</p>
<p>“Don’t subsidize personal electric vehicles. Charge for pollution. Subsidize transit, active transport. Electric vehicles are barely an improvement over gas vehicles. Change focus.”</p>
<p>“How will the government offset the loss of the gas tax revenue as more people switch to electric?”</p>
<p>“Will there be "fee" for kilometers traveled in order to continue to maintain roads and bridges?”</p>
<p>“The private sector needs to be involved in setting up charging stations. We already have gas stations, simply make it a requirement for gas stations to have charging stations. The infrastructure is there, convenience stores, car wash and vacuum stations, air for tires etc. This is a simple solution, and it would not cost the taxpayers a cent. Bottom line, government should get out of the way, set some basic regulatory requirements and let the private sector deliver the service.”</p>
<p>“Put pressure on charging networks to offer better service by allowing paying by debit / credit card; hold them accountable if a charging station is offline; require them to disclose statistics about failed charging events.”</p>
<p>“I’ve often thought that if automakers or government were serious about promoting electric vehicles there would be a program of short-term rentals at a modest cost to allow people to sample the alleged joys of electric mobility. I would love to try some cars this way to see what all the fuss is about, and maybe it would convince me to purchase one.”</p>
<p>“I would like to see governments keep to a regulatory oversight role. For example, mandate charging stations in apartments/condos, possibly some research into best practices, but leave the implementation costs/specific implementations to the owners.”</p>
<p>Transit and other modes of transportation</p>
<p>“Simply taking the existing vehicles and electrifying them is not enough. It must be our #1 priority to eliminate car-dependence, so that families can accomplish everything they need to do in their lives without having to use a large heavy vehicle. Need to focus on reducing the size of vehicles used when it is not necessary to transport large amounts of goods and equipment. For the majority of trips in the City of Burlington it is not necessary to carry around thousands of kilograms of metal.”</p>
<p>“More public transit, especially for medium distance trips (200-400 km).”</p>
<p>“A strategy to REDUCE autos is best way for ALL. Make public transit the future. Tax credits for public transit NOT cars. Bicycles are also excellent ways to help us ALL. You save on health care (if you can promote rider safety from big auto trying to kill riders...). Land, parking lots used for autos converted to housing or parks.....think outside of the BOX.”</p>

2. Electric Bike Survey Analysis

I. Results at a Glance:

a. Ownership: 25.8 % of survey respondents currently own an electric bike or have in the past.

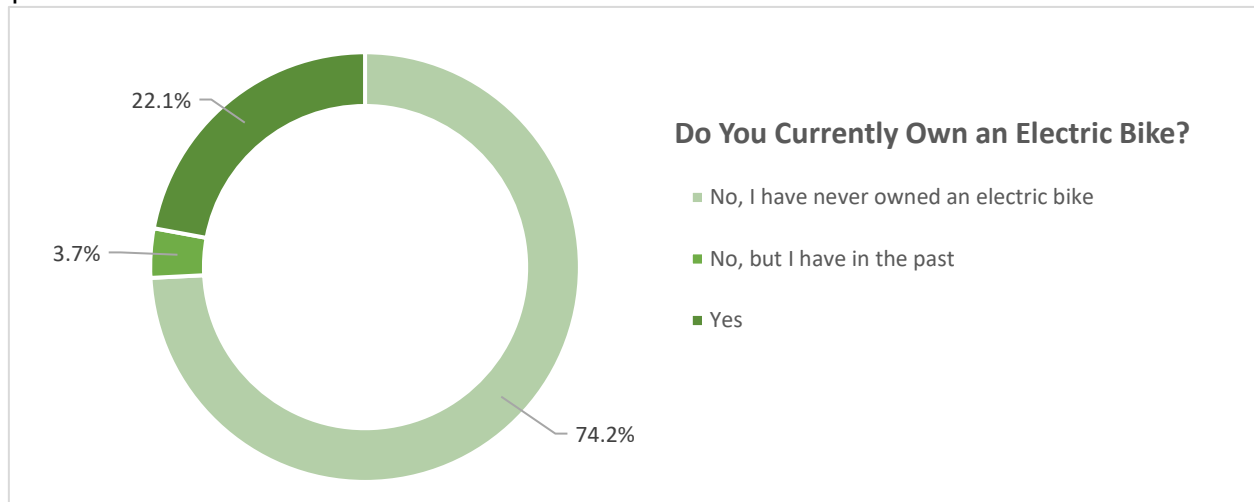


Fig. 28: Do you currently own an electric bike? (163 responses)

b. Housing Type: 85.3% of respondents live in a single detached house, a semi detached house or a row/townhouse versus 14.7% of respondents who live in an apartment/condo building.

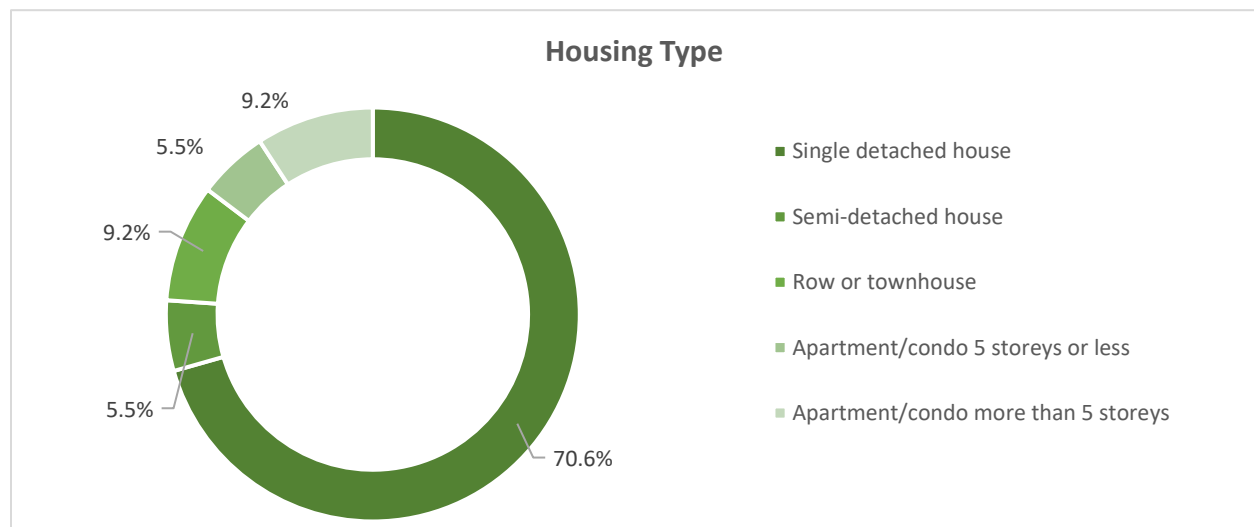


Fig. 29: What type of home do you live in? (163 responses)

c. Age range: 66.5% of survey respondents are between the age of 45 and 74.

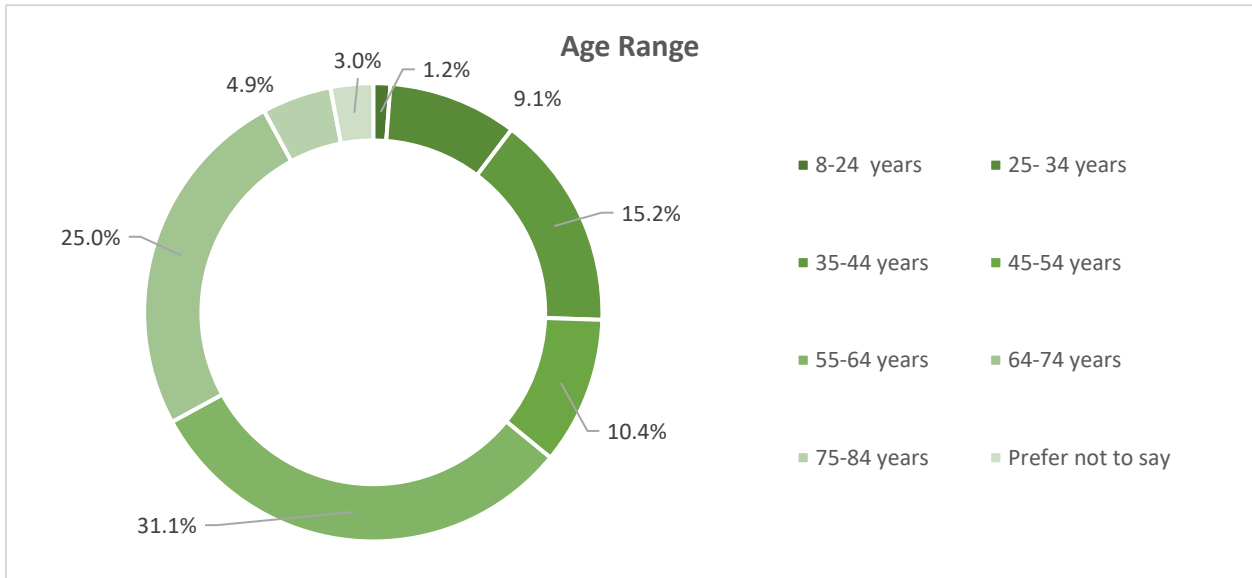


Fig. 30: What is your age range? (164 responses)

d. Average household income: 47.6% of survey respondents indicated an annual household income of \$100,000 or higher.

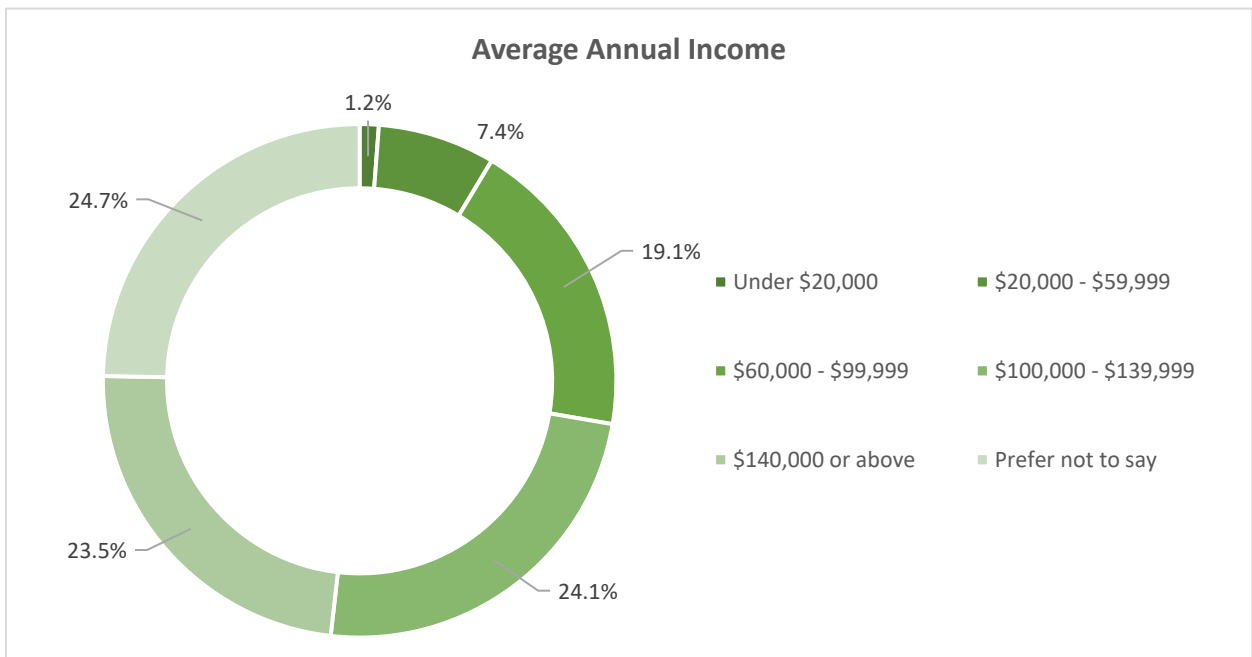


Fig. 31: Which of the following best describes your total household income last year, before taxes, from all sources for all household members? (162 responses)

e. Knowledge of electric bikes: An overwhelming majority of survey respondents have some degree of knowledge about electric bikes, with 99% indicating they have “heard about electric bikes, but don’t know much about them” or “know a lot about electric bikes.”

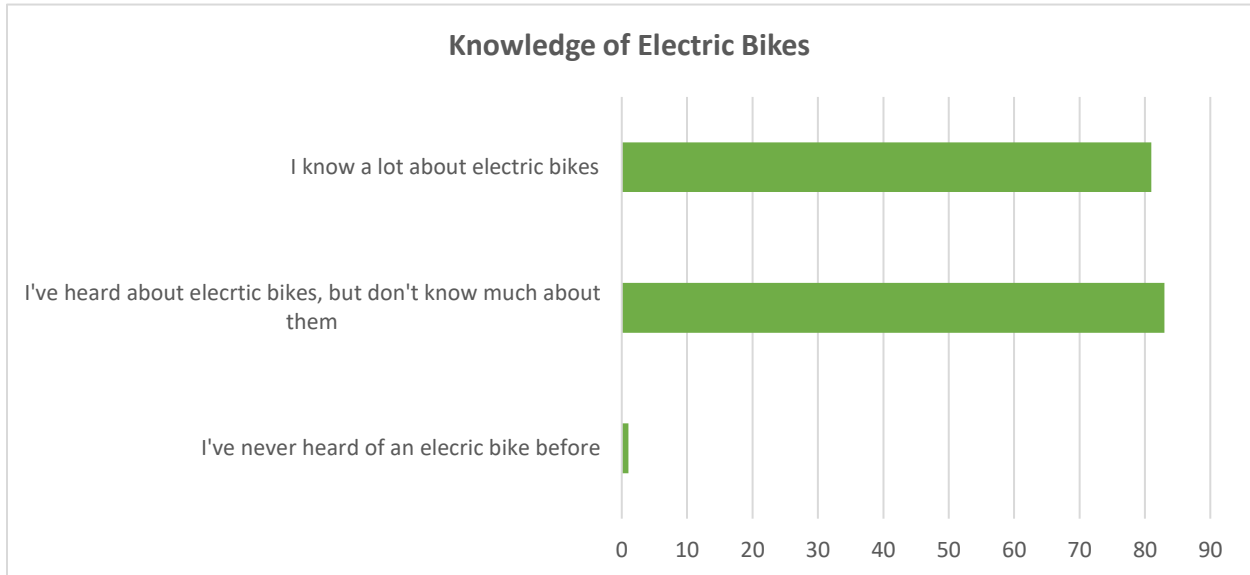


Fig. 32: Which of the following describes your knowledge of electric bikes? (163 responses).

II. Electric Bike Ownership Experience:

a. Satisfaction: 88.8% of survey respondents are “very satisfied” or “satisfied” with their electric bike.

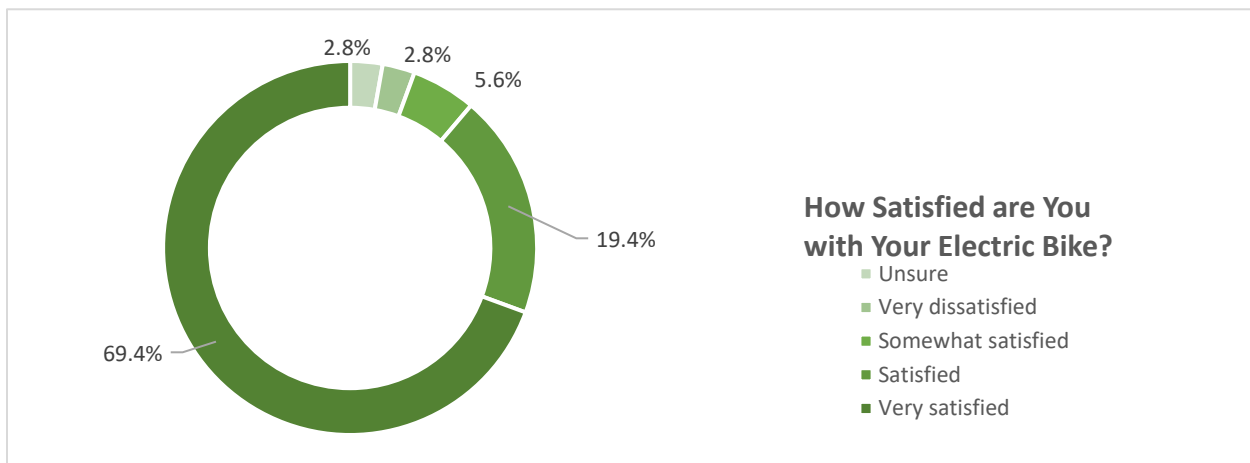


Fig. 33: How satisfied are you with your electric bike? (36 responses)

b. Ownership Challenges: Concern about theft, access to charging and range were top electric bike ownership challenges.

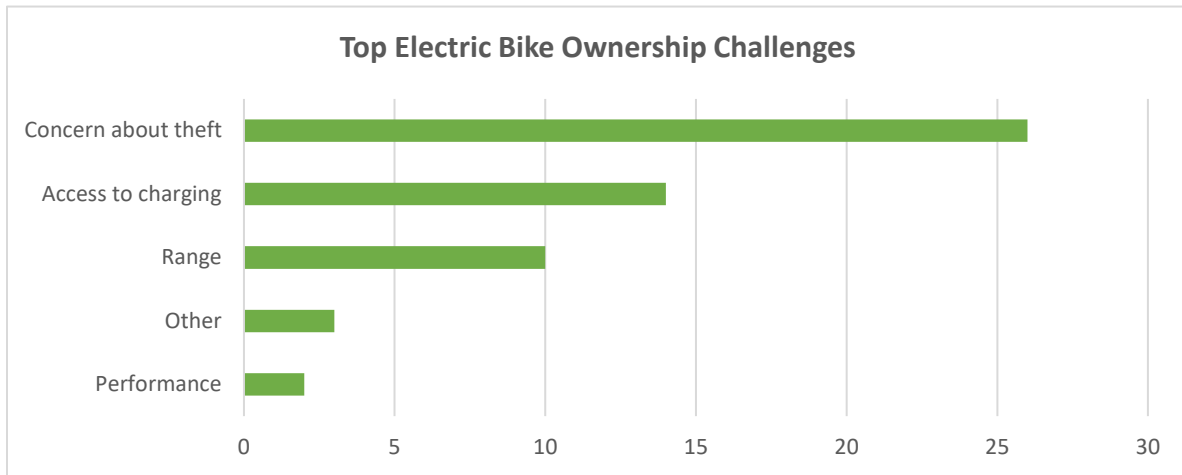


Fig. 33: What are the top electric bike ownership challenges you face? Check all that apply. (33 responses)

Other electric bike ownership challenges include:
“Prices and weight of the bike.”
“Poor segregated (from automobile traffic) unsafe bike lanes across Burlington.”
“Access to variety.”

c. Top reasons to use an electric bike: Recreation and exercise, running errands and riding farther than a regular bike were the top reasons survey respondents who owned an electric bike bought one.

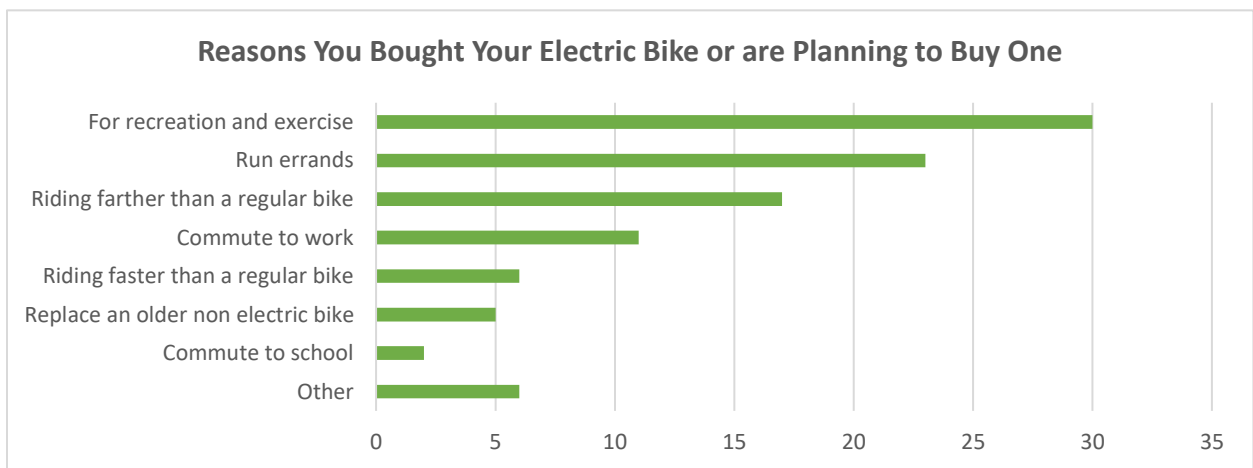


Fig. 34: What are the reasons you bought your electric bike? (41 responses) *

* Question updated to align with question logic.

Other comments on reasons to buy an electric bike included:
“Getting out into nature.”
“Getting old.”
“Due to aging our E-bikes allow us (my wife and I) to ride often without exerting ourselves, especially uphill.”
“Arthritis in my knees limits my ability to ride a regular bicycle and also to walk long distances.”

d. Electric bike uses: 91.7% of survey respondents who own an electric bike indicated that their electric bike has replaced their car for trips that are less than 10 km, and 33.3% indicated that they use their electric bike to commute to work or school.

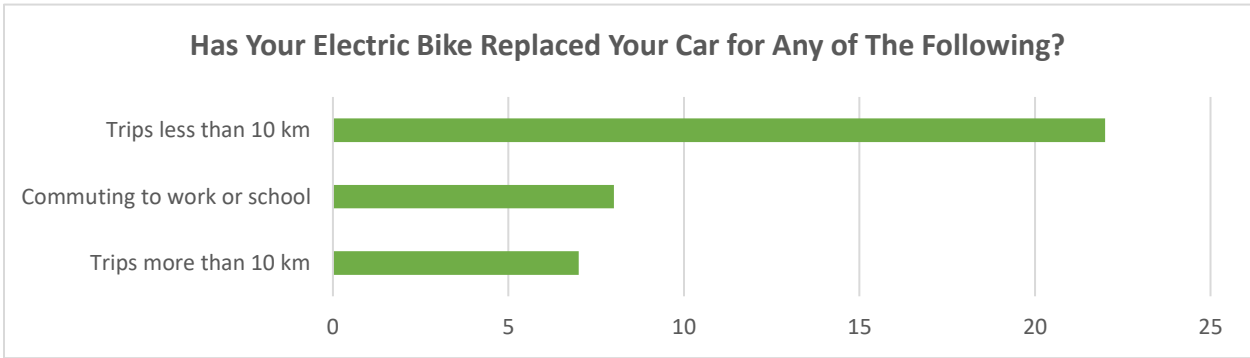


Fig. 35: Has your electric bike replaced your car for any of the following? (24 responses)

e. Average Cycling Trip: 72.2% of survey respondents who own an e-bike cycle between 6 – 25 km on an average trip.

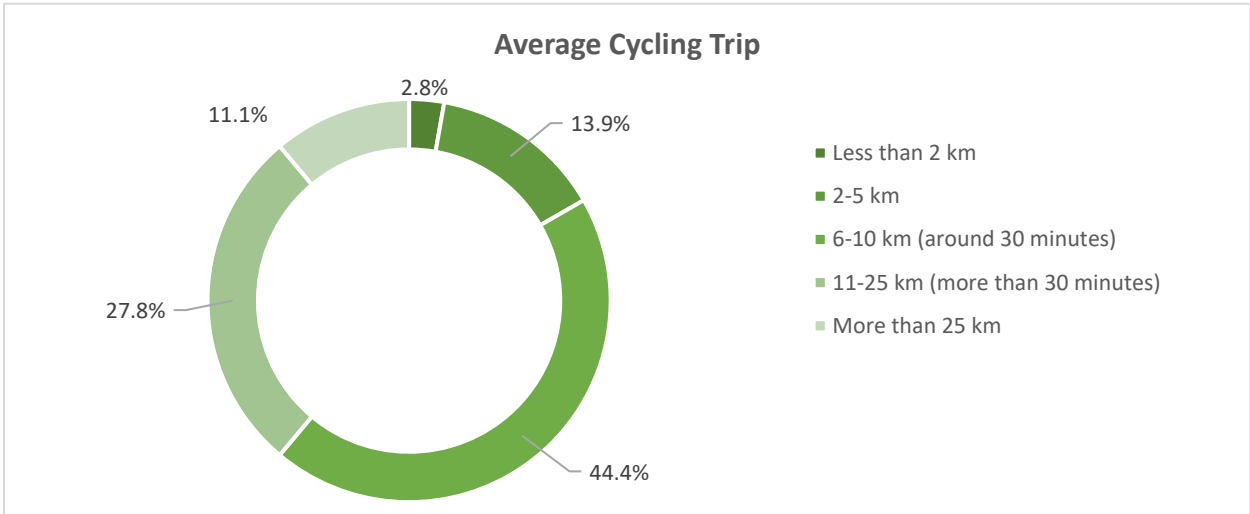


Fig. 36: Approximately how much do you cycle on an average trip? (36 responses)

f. Overall vehicle satisfaction: An overwhelming majority of respondents would recommend an electric bike to a friend or family member.

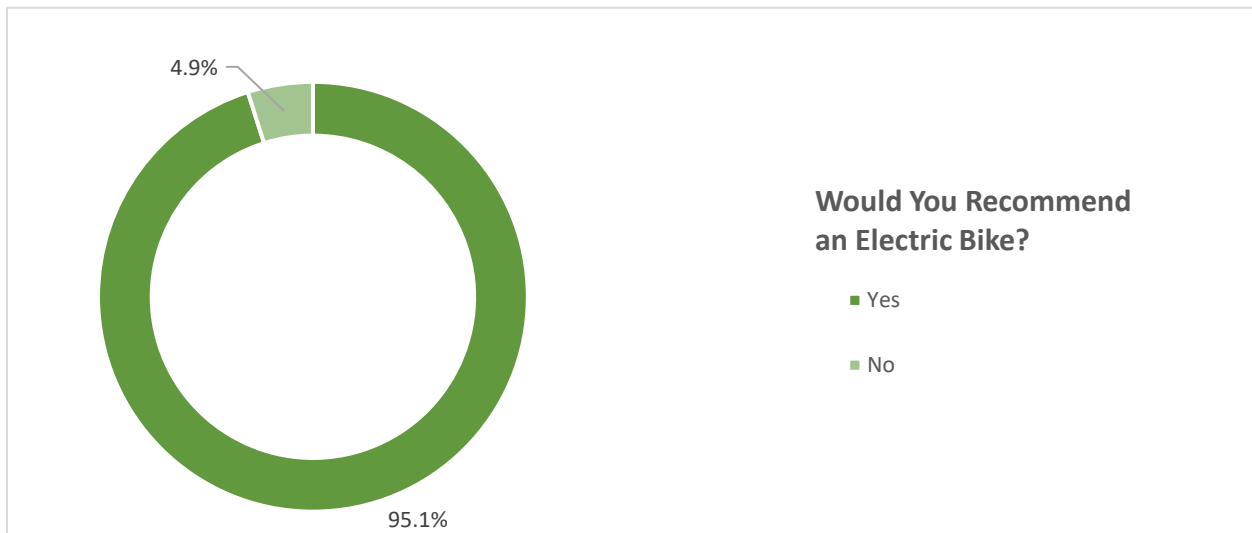


Fig 37: If you already have an electric bike, would you recommend one to a friend or family member? (41 responses)

III. Understanding Barriers and Opportunities to Higher Electric Bike Adoption:

a. What is holding nonelectric bike owners back from purchasing one? Purchase price, not knowing enough about electric bikes to buy one, restrictions on where to ride electric bikes and concerns about theft were the top reasons holding survey respondents back.

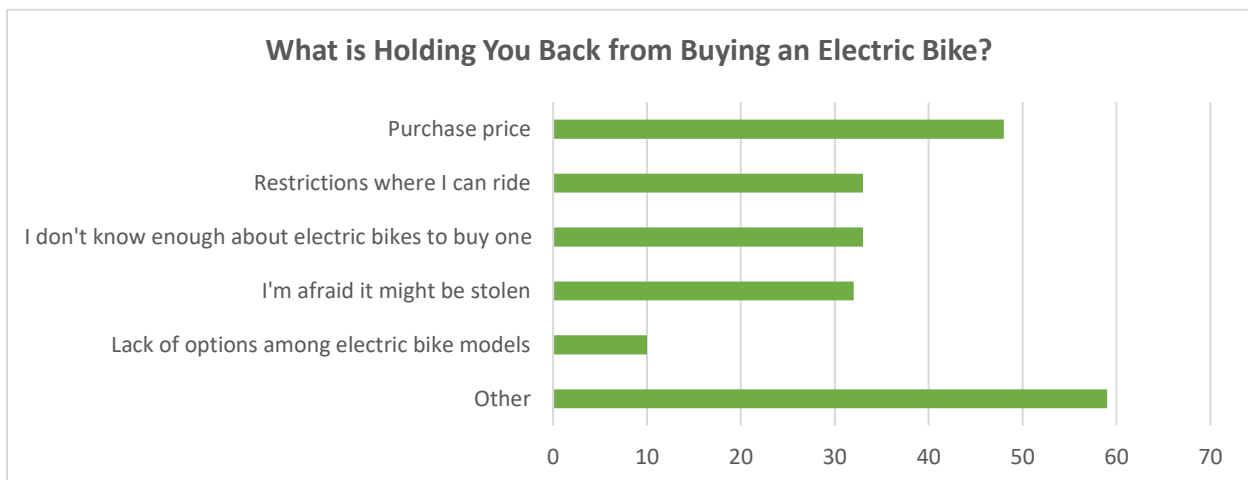


Fig. 38: Which of the following attributes (if any) are holding you back from purchasing an electric bike? Choose all that apply. (126 responses)

Other reasons included:
“(I) would rather obtain health benefits from walking.”
“Weight - lifting or carrying it is a concern.”
“Range - how much of the battery can I actually use(?)”
“Too heavy to transport to other areas on bike rack.”
“Too dangerous to ride on the road with cars and trucks.”
“Safety features and winter friendly.”
“Not practical in spaced out city especially since I’m usually travelling with my kids and/or dog.”

b. What options would alleviate concerns about the theft of electric bikes? A locked or supervised area, a secure designed electric bike parking facility and surveillance cameras were the top options survey respondents indicated would make them more comfortable parking your electric vehicle in a publicly accessible location.

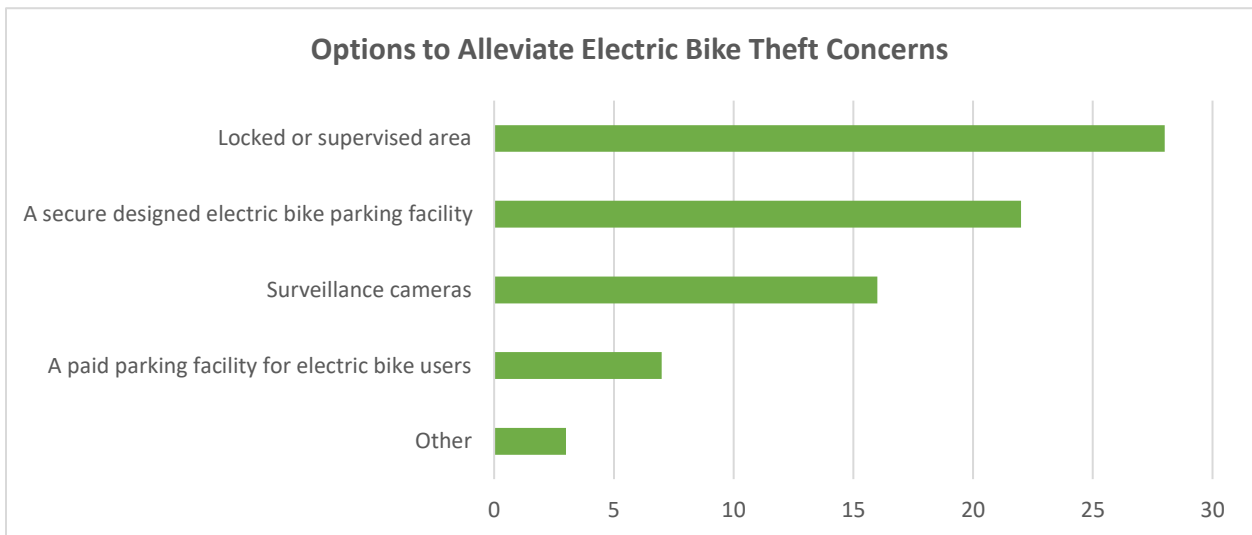


Fig 39: If you are concerned about electric bike theft, choose the options that would make you more comfortable parking your electric vehicle in a publicly accessible location. (32 responses)

c. Thoughts on buying an electric bike: 63.2% of survey respondents who do not own an electric bike “have some interest in getting an electric bike in the future” or “definitely plan on getting an electric bike for my next bike.”

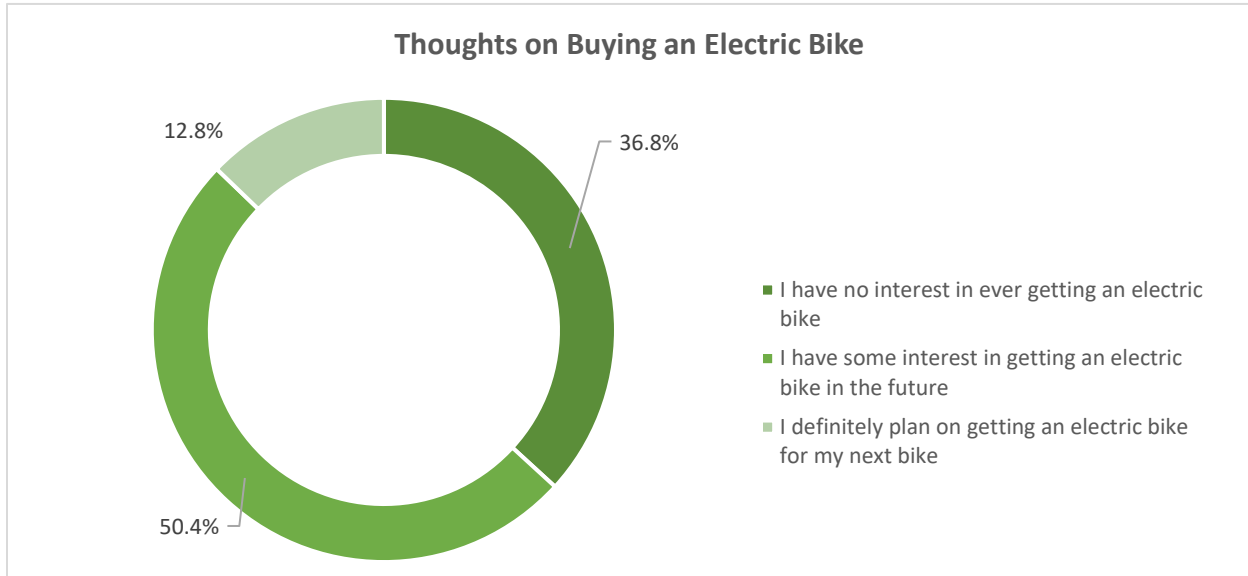


Fig. 40: Which statement best describes your thoughts on buying an electric bike? (125 responses)

IV. Survey Comments:

94 electric bike survey respondents provided further comments and feedback.

Comments included:
Safety and theft Concerns
“Designated and isolated bike lanes need to be added to these major roads.”
“I work out of town and an e-bike is not the best option for me, there is a huge population they could be greatly beneficial to.”
“We need much better infrastructure for safe cycling in our city! Painting a picture of a bicycle on the road does not make drivers considerate of the safety of cyclists. We need our own space on the road, with physical dividers, for cycling to be really safe and inviting.”
“We need infrastructure for e-bikes. I'd love to see more of them, but, not on sidewalks.”
“Todays bicycle riders generally pay no attention to rules of the road. Electric bikes will make this problem worse and more dangerous. I constantly witness bikes running stop signs, riding two or three abreast, riding on pedestrian walkways. It's out of control.”

<p>“They would be very unsafe on sidewalks in speed. Stored and just left in front of stores they would be on top of wheelchairs and walkers causing many accidents they should be license and insured you can not drive a vehicle or a boat without training and a license and insurance. Even when you get your first wheelchair or walker you are given instructions.”</p>
<p>“There should be a speed cap on e-bikes and requirement of some type of license/permit.”</p>
<p>“Please keep them off of our sidewalks and pathways. Restrict them to roadways.”</p>
<p>“Safe places to lock them up during usage.”</p>
<p>“E-bikes are vert quiet, almost make no noise when they pass you. Because of this and also their weight/bulk and speed there should be some restrictions on multi-use paths due to the presence of children and dogs. Speed limits and bells/horns should be considered.”</p>
<p>Price and Incentives</p>
<p>“Incentivize transit and non-vehicle use in road design and future planning decisions.”</p>
<p>“Burlington needs a bike share program with electric bikes.”</p>
<p>“E-bikes can cost in the order of 100% or more than a conventional pedal bike yet the quality of the bike itself can be less. You are paying for the so called tech of the electric components of the bike. E-bikes can rival the cost of a motorcycle. That is crazy.”</p>
<p>Other Feedback</p>
<p>“I'm totally fine with electric bikes that are road in a responsible manner. I might never get one simply because I want the exercise from riding a normal bike.”</p>
<p>“Electric bikes are a great option for those that cannot afford an EV. However, the City has to be bike friendly in order for people to adopt it.”</p>
<p>“Please don't make on road future bike lanes that will impact winter snow removal.”</p>
<p>“Outside electrical 120v outlets at City buildings/facilities/recreation areas (Spencer Smith, beach, libraries, etc.) accessible to public for quick charging for times when needed to complete trip home. Because electrical consumption would be low due to size of batteries, these should be no cost outlets.”</p>
<p>“No clarity in Burlington if you can ride an e-bike on a sidewalk or trail.”</p>

3. Electric Scooter Survey Analysis

I. Results at a Glance:

a. Ownership: 10.9 % of survey respondents currently own an electric scooter or have in the past.

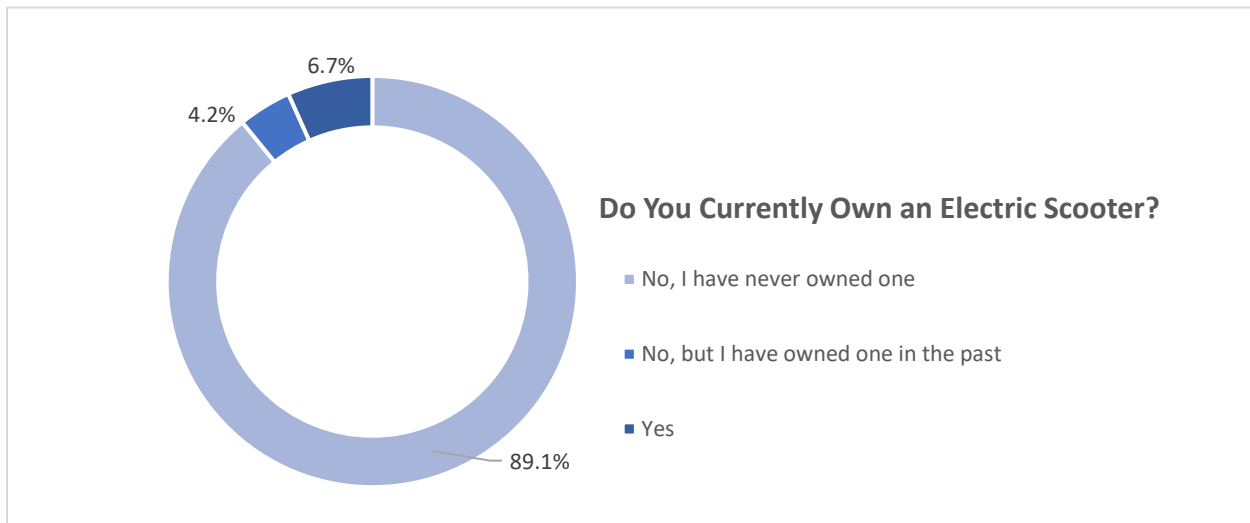


Fig. 41: Do you currently own an electric scooter? (119 responses)

b. Housing Type: 72% of respondents live in a single detached house, a semi detached house or a row/townhouse versus 28% of respondents who live in an apartment/condo building.

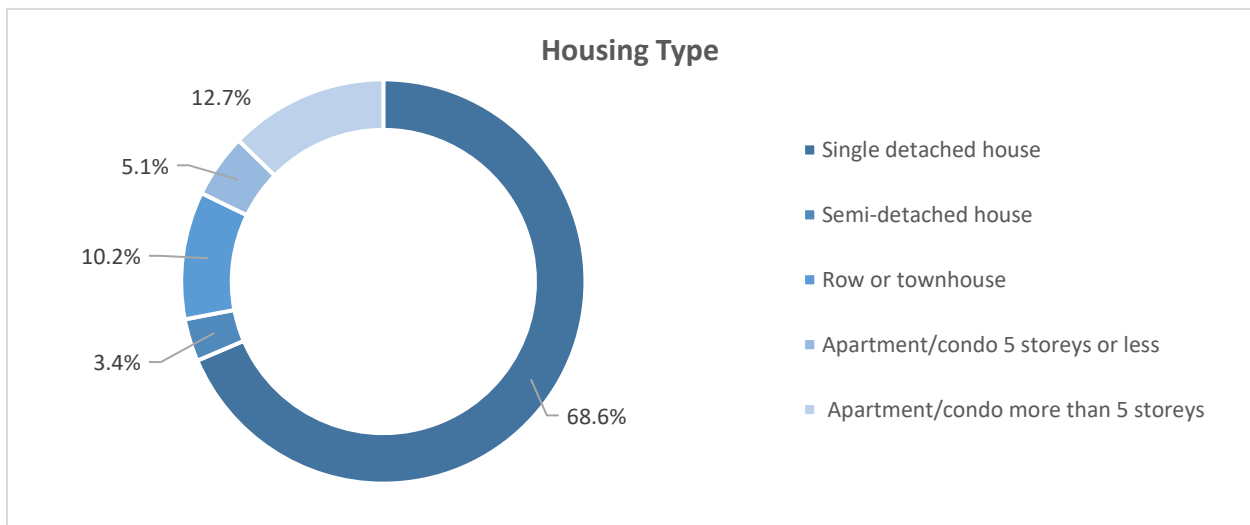


Fig. 42: What type of home do you live in? (118 responses)

c. Age range: 63.1% of survey respondents are between the age of 45 and 74.

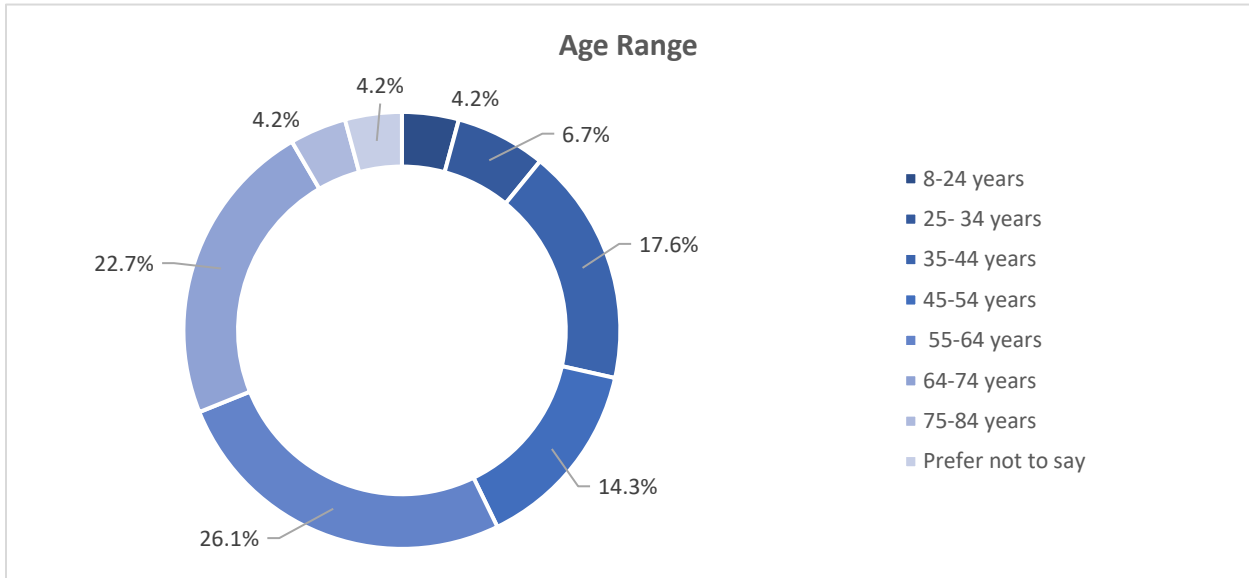


Fig 43: What is your age range? (119 responses)

d. Average household income: 50% of survey respondents indicated an annual household income of \$100,000 or higher.

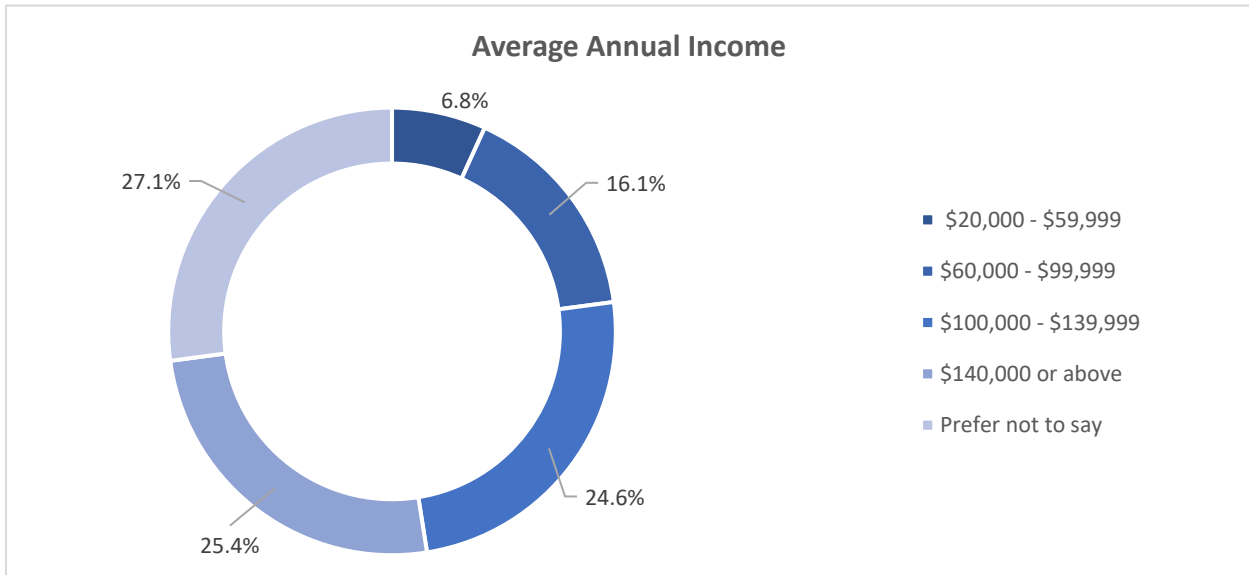


Fig. 44: Which of the following best describes your total household income last year, before taxes, from all sources for all household members? (118 responses)

e. Knowledge of electric scooters: 64.4% of survey respondents have “heard of electric scooters but don’t know much about them” and 35.6% of survey respondents “know a lot about electric scooters.”

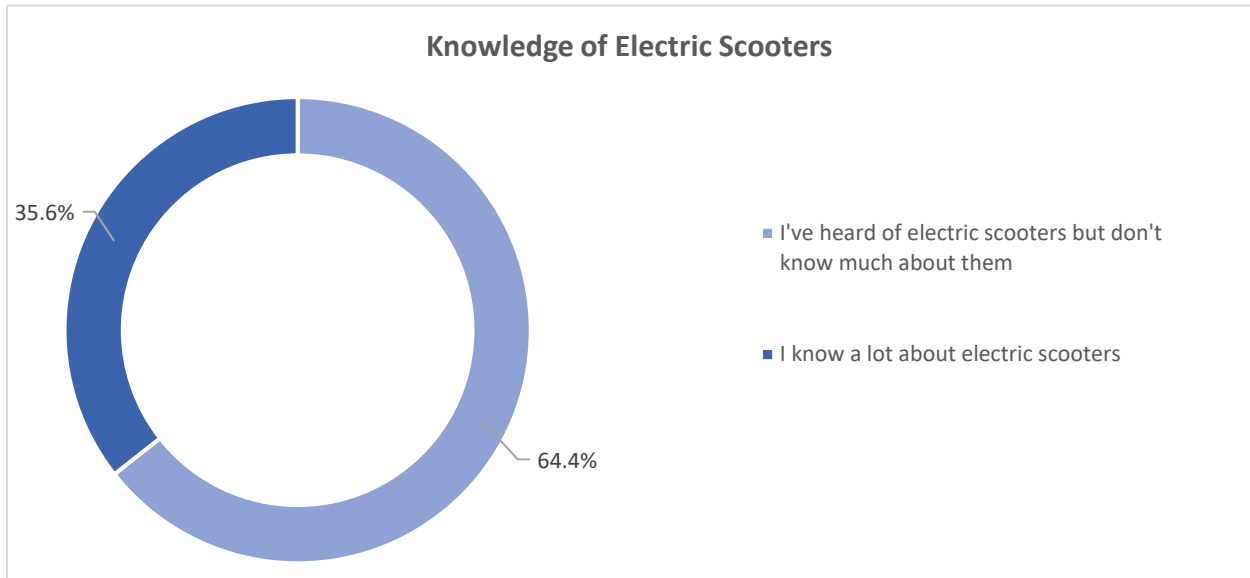


Fig. 45: Which of the following best describes your knowledge of electric scooters? (118 responses)

II. Electric Scooter Ownership Experience:

a. Ownership Challenges: Concern about theft, access to charging and range were top electric bike ownership challenges.

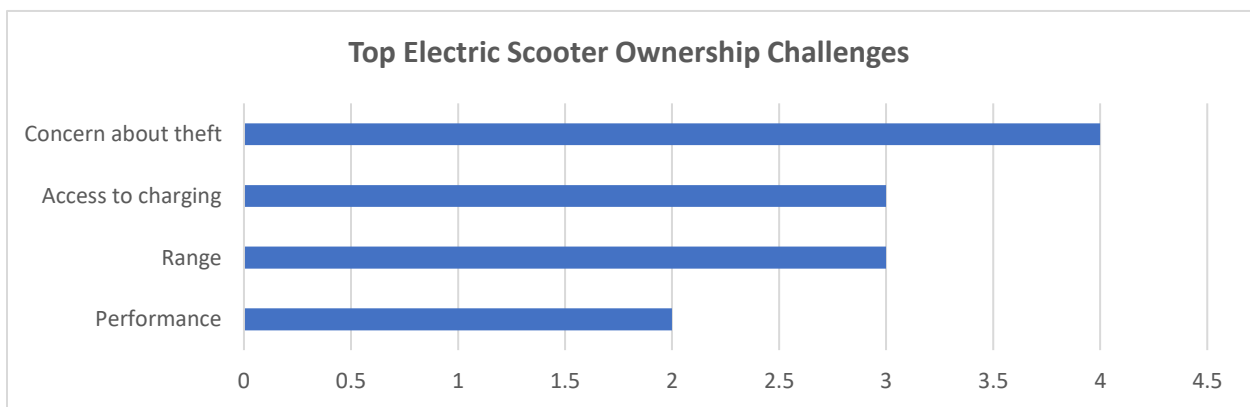


Fig 46: What are the top electric scooter ownership challenges you face? Please choose your top 2. (8 responses)

Other electric scooter ownership challenges include:

“They are very hard to lock up/easy to steal.”

“Some limitations from bylaw are unnecessarily prohibitive. For example, 500w motor limit isn't strong enough to push an adult up a hill, unlike with an e-bike which can be assisted with human pedaling.”

b. Electric scooter uses: 42.9% of survey respondents who own an electric scooter indicated that their electric scooter has replaced their car for trips that are less than 10 km, and 28.6% indicated that their electric scooter has replaced their cars for trips that are more than 10 km. 28.6% use their electric scooter to commute to work or school.

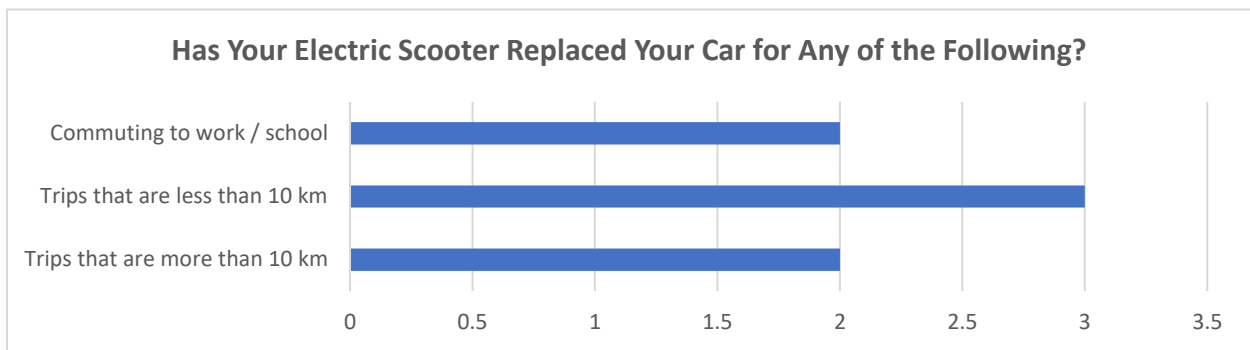


Fig. 47: Has your electric scooter replaced your car for any of the following? (7 responses)

c. Top reasons to use an electric scooter: Commuting to work or school, recreation and exercise and environmental benefits were the top reasons survey respondents who owned an electric scooter bought one.

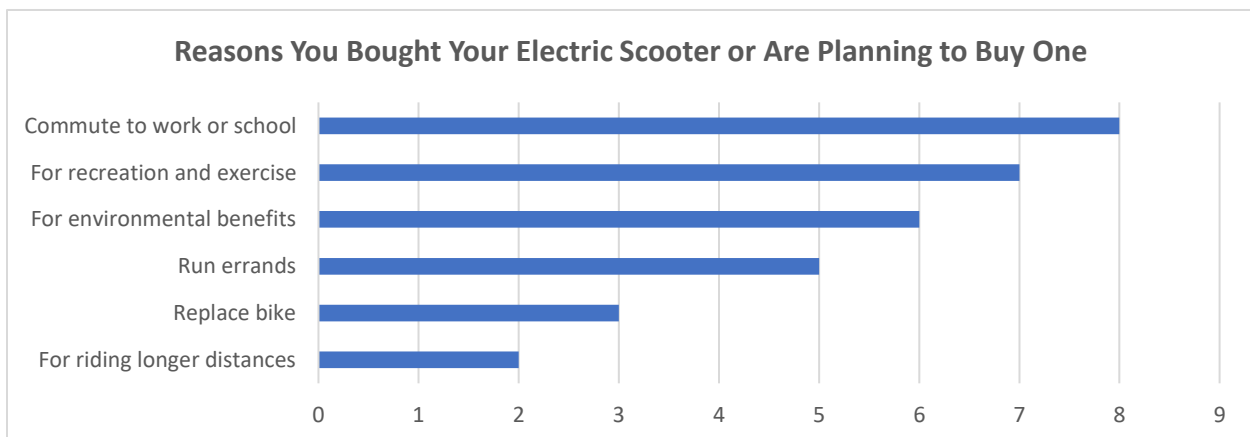


Fig 48: What are the reasons you bought your electric scooter? Select all that apply. (13 responses) *

* Question updated to align with question logic.

Other comments on reasons to buy an electric scooter:

“Trouble walking far or standing for long periods of time run errands in good weather.”

“Disability.”

d. Average electric scooter distance: 75% of survey respondents who own an electric scooter indicated that the electric scooter travel distance per average trip is 10 km or less.

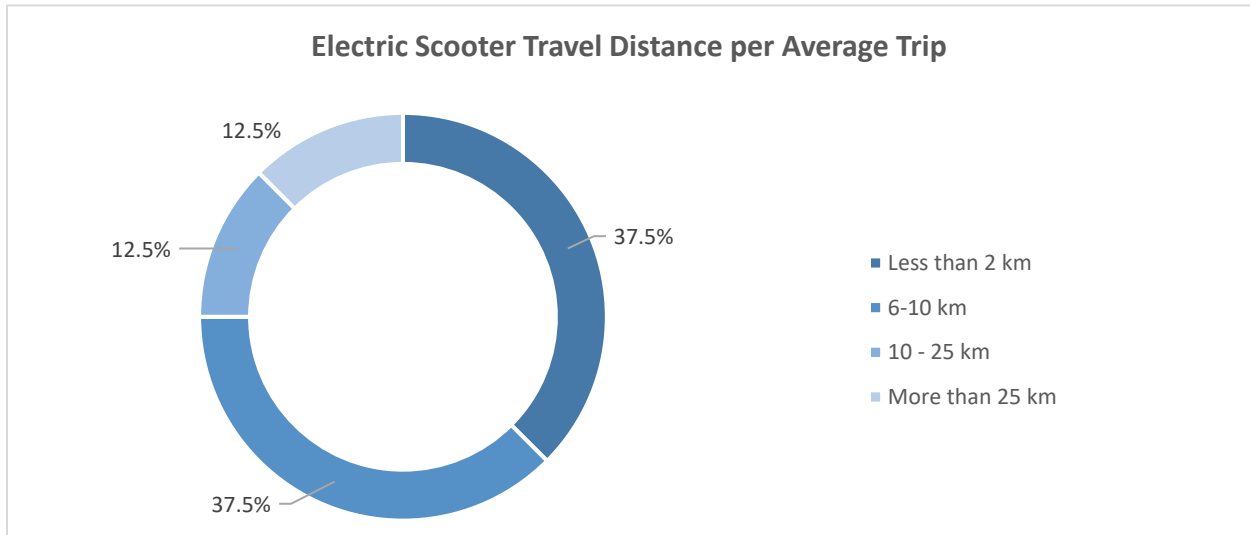


Fig. 49: Approximately how much do you travel on your electric scooter on an average trip? (8 responses)

e. Overall vehicle satisfaction: A 100% of respondents who own an electric scooter would recommend one to friends or family members.

III. Understanding Barriers and Opportunities to Higher Electric Scooter Adoption:

a. What attributes would most encourage the adoption of electric scooters? Less effort to ride and going faster on an electric scooter than a pedal bike were the top attributes survey respondents indicated would most encourage them to purchase an electric scooter.

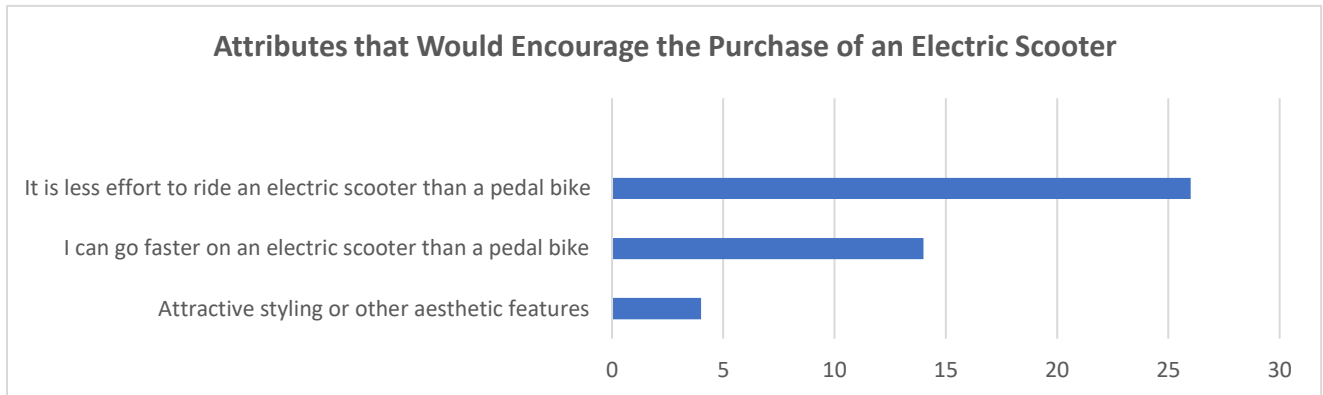


Fig. 50: Which of the following (if any) would most encourage you to purchase an electric scooter? (37 responses)

b. What is holding nonelectric scooter owners back from purchasing one? Safety concerns, age appropriateness and not getting enough exercise were the top reasons holding survey respondents back.

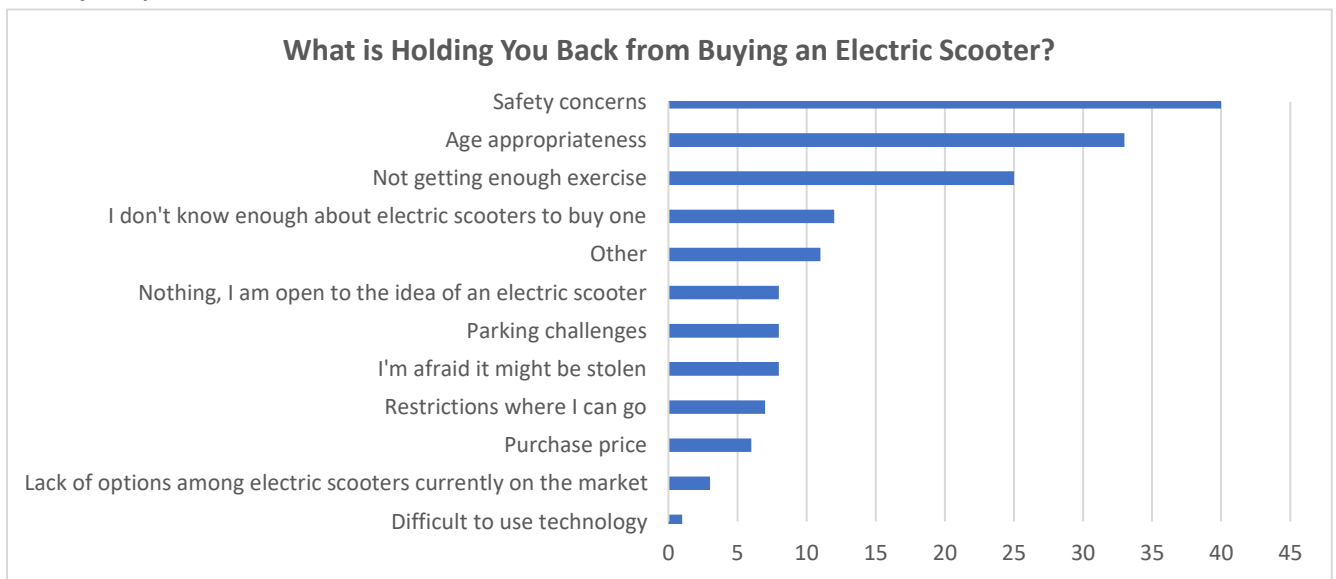


Fig. 51: Of the following attributes, which, if any, are holding you back from purchasing an electric scooter? Check all that apply. (72 responses)

Other reasons included:
"(I) Would much prefer an e-bike."
"Would be interested in a " sharing program" for around the city, for e scooter, e bike, you have choice to use electric or not for an e bike depending on where you are."
"Too dangerous to ride on the streets - traffic is too heavy and congested."
"No where to store items, like carriers or saddlebags on a bike."
"Lack of general function beyond getting from A to B. If my workplace was closer, it'd be a viable option."

c. What options would alleviate concerns about the theft of electric scooter? A locked or supervised area, a secure designed electric scooter parking facility and surveillance cameras were the top options survey respondents indicated would make them more comfortable parking your electric scooter in a publicly accessible location.

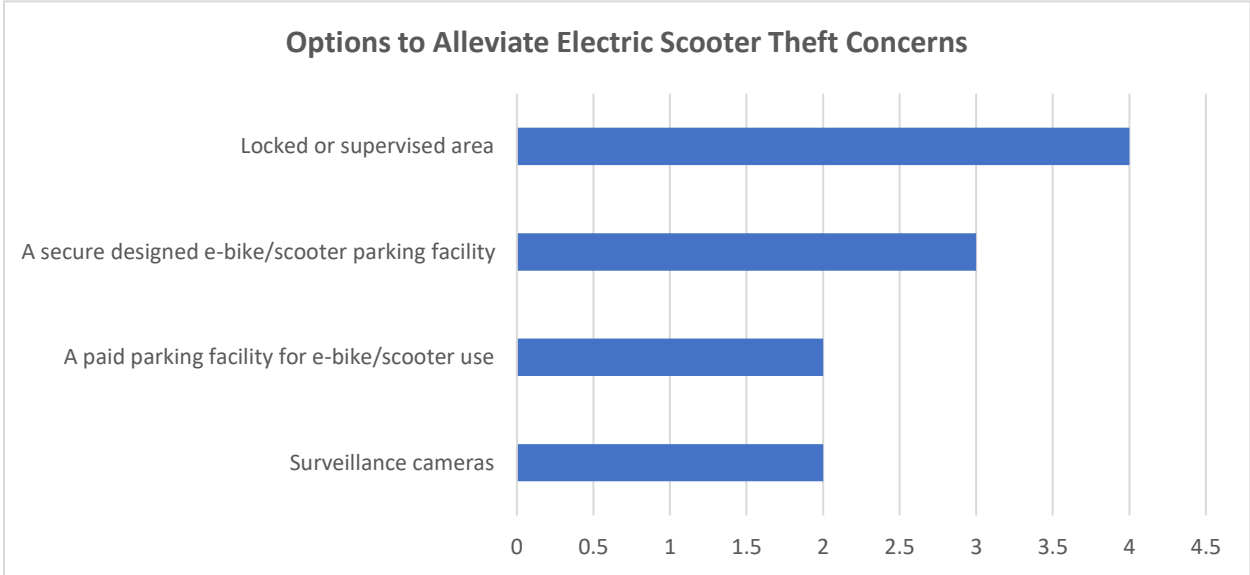


Fig. 52: If you are concerned about electric scooter theft, would the following make you more comfortable parking your electric scooter in a publicly accessible location? (4 responses)

d. Thoughts on buying an electric scooter: 33.6% of survey respondents who do not own an electric scooter “have some interest in getting an electric scooter in the future” or “definitely plan on getting an electric scooter”.

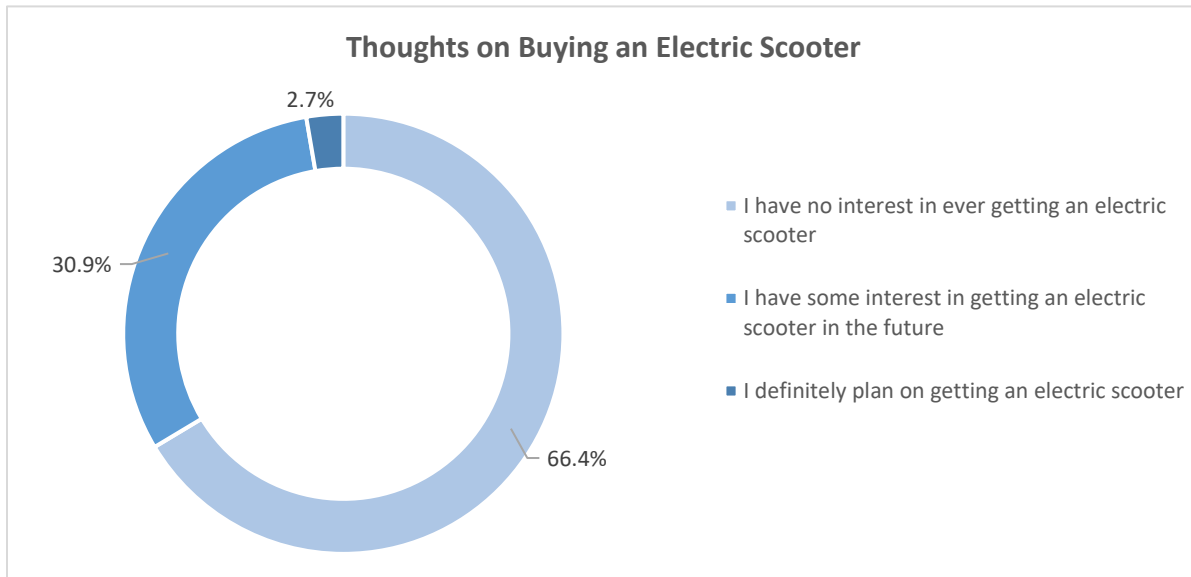


Fig. 53: Which of the following statements describes your thoughts on buying an electric scooter? (110 responses)

IV. Survey Comments:

73 electric scooter survey respondents provided further comments and feedback.

Comments included:
Safety and Theft Concerns
“Where would electric scooters be legal to run? Accident (are) inevitable. Road use is unsafe even in designated bicycle lanes, and use of pedestrian sidewalks is unacceptable - major safety concerns.”
“Where can they be safely parked? How do we get community members t to respect them and share the road?”
“They shouldn't be allowed on sidewalks or multiuse paths like Lakeshore Road.”
“These need to be licensed. They are already a safety concern for elderly people out for walks, just like bicyclist travelling too fast.”
“The issues around insurance on these, and e-bikes, issues with thefts in our area. Make this a very problematic investment. The fact that we have major issues with cars speeding and not obeying the laws, will be a really scary combo with e-bikes & scooters.”

“Some of these are too fast and it should be mandatory that all riders no matter their age to wear helmets. Also, should be mandatory that a bell or horn be attached”
“Safety & Liability must be fully the responsibility of the scooter owner.”
“Like electric cars, electric scooters are silent which means that it is dangerous for the elderly and disabled who won't be able to hear them coming. They also can go very fast for a 2 wheel vehicle and could cause a serious accident for pedestrians.”
“Electric scooters are usually known for poor storage when not in use/at a charging station. I don't want to see electric scooters littered on the sidewalk while they charge.”
City Actions
“I would think that some driver training would be valuable, for the protection of driver and the public. Also, making it safe to use in traffic would be important.”
“Electric scooters should be added to current bylaws allowing their use. Encouraging as many forms of electric last mile transportation will increase public transit use and decrease road congestion. Additionally, this is a green solution.”
“Current laws and bylaws should be communicated to the citizens so we can make informed decisions about purchasing electric transportation (bikes or scooters). Where to ride, speed limits, licensing if any, and insurance requirements.”
“Would the city install chargers for these at city parking lots?”
“There should be a scooter program similar to European cities.”
“Promote and support everything electric!”
“Please look into a ride-share type model, like Lime or Bird.”

B. MEET Burlington with Plug n Drive

The City and Burlington Hydro hosted [Plug'NDrive's](#) popular [Mobile EV Education Trailer \(MEET\)](#) for four weeks at Central Park from April 23 to May 20, 2022. The month long EV activation provided an opportunity for Burlington residents to test drive an EV, learn more about EVs and charging technology solutions, and a chance to meet other EV owners in the community.

Over the four week period, 252 people visited MEET Burlington, conducting 362 test drives. Visitors came from neighbouring towns and cities, with the majority residing in Burlington and Oakville (62.3%).

Visitors were asked to complete a survey after conducting their EV test drive. Survey respondents ranked “cost to purchase” as the most important EV area of importance. “Access to charging” and “cost to drive” were tied in ranking as the second most important area, and “environmental impact” was ranked as the third most important area.

The event was very successful with nearly 85% of survey respondents indicating that they are more likely to purchase an EV after conducting their MEET Burlington test drive.

Visitor comments included:
“Great, knowledgeable staff who answered all my questions, recommended experience.”
“It was helpful to learn more about EVs and to feel more comfortable about buying one.”
“Excellent experience all around from the vehicle to the advisor.”
“Great to have the opportunity to drive the EV cars. Thank you.”
“Fantastic, I would highly recommend this to my neighbours and friends. I had no idea the power and smooth operation of the vehicle. I will now look at an electric vehicle for my next purchase.”
“Awesome explanation about the car from the staff. Thank you!”
“Excellent demonstration and information provided by staff, we are so much more informed!”
“Great demonstration and discussion of EVs.”
“Awesome. Staff was friendly and knowledgeable.”
“Brilliant, Friendly and informative.”
“Excellent information and customer relations was outstanding.”
“Excellent service. Well informed and passionate advocates for EV's.”
“Fantastic! EV ambassadors were very well versed and knowledgeable. I will definitely be purchasing in the near future.”
“Good information and answered all our questions.”
“Great information and overall experience. Excellent staff.”

“Great. Learned a lot and enjoyed time in the drive.”
“I enjoyed this meeting very well. I got more information that I had before. It was well worth the time. The people were very nice. A terrific service, well presented and very enlightening.”
“Perfect, lots of information and hands on experience.”
“This was an excellent opportunity to experience electric vehicles. Great explanations. Thank you!”
“Very formative. It was nice to be able to test drive more than one vehicle.”

C. Stakeholder Feedback

To date, 47 stakeholders representing 39 organizations, City departments, the EV supply chain and the community were engaged to identify the barriers and opportunities for higher uptake of electric mobility in Burlington. Stakeholders provided their feedback and insights through participation on the Electric Mobility Strategy Advisory Committee, one on one interviews and phone calls.

Burlington City staff from different departments were engaged to ensure the alignment of the Electric Mobility Strategy to other overarching goals, plans and policies; and to identify opportunities for synergies and collaboration. It is worth noting that there is strong alignment between the goals of the Electric Mobility Strategy and the Integrated Mobility Plan currently under development, with a shared objective of sustainable mobility and reducing emissions from vehicles, in addition to exploring opportunities for other modes of transportation including e-bikes and e-scooters.

What we heard from stakeholders

Through the stakeholder engagement process, several barriers to higher uptake of electric mobility were identified, and ideas and action themes were discussed to address these barriers.

Barriers to Higher Uptake of Electric Mobility in Burlington:

I. Supply:

Demand for electric vehicles in Ontario outstrips supply and lengthy wait times often exist for most electric vehicle models on the market. Additionally, supply chain challenges resulting from the COVID pandemic have further impacted supply, and demand for electric vehicles has risen in 2022 due to the increase in gas prices.

Ideas and potential action themes discussed to address the supply of EVs included:

- a) Advocate for a ZEV mandate at the provincial level: Provincial mandates have proven to be effective in directing electric vehicle supply in Canada. According to a 2021 [report](#) from Dunskey Energy and Climate on ZEV availability, less than a quarter of dealerships nation-wide have three or more ZEVs in stock. Outside of Quebec, BC and Ontario, only 18% of dealerships have any ZEVs available at all, and only 4% have 5 or more. Auto manufacturers who [over comply with ZEV mandates can also benefit by trading excess credits](#). ZEV mandates also help with predictability and transparency and signal a strong commitment to supporting electric mobility from higher levels of government. Additionally, they are also often accompanied by purchase incentives to support and accelerate the transition to electric vehicles.

II. Purchase Price:

Electric vehicles are currently more expensive than gasoline cars in the same category. Incentives continue to play a role in supporting and enabling Canadians to switch to electric vehicles. As electric vehicle uptake increases and the market matures, it is expected that price parity will be reached, gradually eliminating the need for government incentives.

Ideas and potential action themes discussed to address purchase price included:

- a) Advocate for continued incentives at the federal level and re-instating incentives at the provincial level. Canada's [2022 budget](#) allocates [\\$1.7 billion](#) to extend the ZEV sales rebate for 3 years, providing predictability and continuity to Canadians who are planning on purchasing a vehicle in the short and medium term. Continued advocacy to support and maintain purchase incentives is important until the market matures, and price parity is reached. Advocating at the provincial level to reinstate incentives that can be combined with the federal incentive will further drive down the cost of electric vehicles and expand access to them. Implementing a provincial ZEV mandate modelled after successful jurisdictions such as [Quebec](#) and [British Columbia](#) is recommended.
- b) Support and grow the used electric vehicle market. As the electric mobility market matures, the used electric vehicle segment will grow, making electric vehicles more accessible. The City of Burlington can play a role in supporting the used electric vehicle market by providing information and resources including rebates on used electric vehicles (such as the [used EV incentive offered by Plug N Drive](#)) and information on dealers that offer used electric vehicles among other actions.

III. Charging Infrastructure:

Limited electric charging penetration and coverage is a barrier to higher electric vehicle uptake in Burlington. Demand is outpacing the charging infrastructure, and immediate investment is needed to address current and future charging needs across the city.

The cost and technical / power requirements of charging installations in some settings such as multi-residential buildings (apartments and condos) are also a challenge. An expensive retrofit is often necessary to install electric vehicle charging infrastructure in existing buildings. Condo boards and property managers consistently find the process expensive and intimidating. Charging station providers have noted that in their experience, the federal funding support provided by [Natural Resources Canada](#) for charging infrastructure is necessary to offset the cost.

While most electric vehicle drivers will primarily charge at home, a robust public charging infrastructure will alleviate range anxiety and support the electrification of commercial fleets to accelerate the transition to electric mobility. Ensuring driver needs are met and a positive driver experience will be determining factors to whether the transition to electric mobility is seamless or not. Factors to consider include: can drivers book a charging slot in advance? Can a partnership be created between charging station providers and large retailers to provide a value proposition and support the transition? How can electric vehicle drivers be encouraged to vacate the charging slot as soon as their vehicle is charged so another electric car can plug in?

Ideas and potential action themes discussed to address electric vehicle charging challenges included:

- a) Charging station installations in multi-residential buildings.
 - For new developments: Assess the feasibility of reducing parking requirements in exchange for “EV Ready” requirements in new developments. Engage developers early on in the process to secure support and buy in. Examples of successful municipalities that have amended zoning or parking bylaws to support EV Ready parking requirements include the [City of Vancouver](#) and the [City of Toronto](#).
 - For existing buildings: Advocate for the expansion of [federal funding](#) for charging infrastructure and for an easier, more streamlined application process.
- b) Public charging network: Ideas to rapidly expand the public charging network include exploring opportunities for partnerships with the private sector to install public charging stations, engaging Halton Region to support regional charging coverage and continuing to pursue funding for public electric charging stations to expand the charging network beyond the downtown core.

b) Additionally, establishing a policy to identify opportunities to increase electric vehicle chargers on City property, prioritize the installation of DC fast chargers and targets to increase electric vehicle chargers to service accessible parking spots is also recommended.

IV. Grid capacity and demand management:

Ensuring adequate grid capacity is critical to a successful transition to electric mobility in the community.

Ideas and potential action themes discussed to address grid capacity concerns included:

- a) Recommendations to ensure adequate grid capacity include encouraging Burlington Hydro to explore emerging technologies such as bi-directional charging and assess the feasibility of implementing a pilot in Burlington. Bidirectional charging pilots in Canada include the [Smart Grid Nova Scotia pilot](#) and a [pilot under development](#) by Peak Power for Hydro One.
- b) Work with Burlington Hydro to assess the impact of increased demand on the grid and determine the best strategies to mitigate.
- c) Collaborate with Burlington Hydro to set up a process to encourage/incent homeowners to advise when they have installed an electric vehicle charger, to support power planning and forecasting.
- d) Support and advocate for the speedy implementation of a [new ultra-low overnight electricity rate](#). The proposed electricity price plan will reduce electric vehicle charging costs by encouraging charging at night, when province-wide electricity demand is lower.

Opportunities to Advance Electric Mobility in Burlington

Local Leadership

The City of Burlington has an important role to play in leading by example to accelerate the transition to electric mobility in the community. Building on its current and planned electric mobility investments and signalling a strong commitment to achieving the Climate Action Plan's target of carbon neutrality by 2040 for city operations, the City has an opportunity to establish Burlington as a leader in electric mobility in Ontario.

Ideas and potential action themes discussed to demonstrate the City's leadership in advancing electric mobility included:

- a) Brand the City Fleet. Design attractive taglines and visual branding with a strong call to action that aligns to the Climate Action Plan and encourages the community to follow the City's lead.

- b) Educate and train City staff as needed. As the City transitions to a green fleet, assess the need for staff education and training to operate and maintain new electric vehicles and equipment. Consider extending education and training to groups outside of City Hall including other municipalities, school boards and regional staff.

Electric Vehicle Awareness and Knowledge

Recent [research](#) indicates that Canadians have “mixed views” and a lack of knowledge about electric vehicles. 66% of Canadians surveyed have never driven or been a passenger in an electric vehicle. While the Burlington community survey results indicate a higher awareness of electric vehicles among Burlingtonians with 100% of survey respondents indicating they have a degree of knowledge of electric vehicles, the majority of stakeholders engaged agreed that lack of awareness is a big challenge to electric vehicle uptake in Burlington. Lack of awareness and knowledge is widespread across a multitude of electric vehicle topics including range anxiety, the availability of public charging infrastructure and available rebates. This is an area that represents one of the highest opportunities for City action to accelerate the uptake of electric mobility in Burlington by establishing an “E-Mobility Hub” to act as an electric mobility knowledge and resource hub.

Ideas and potential action themes discussed to advance electric vehicle awareness and knowledge included:

- Electric chargers’ signage and visibility. Ensure that public chargers in municipal lots are clearly marked with attractive and informative signage. Potential signage messaging can include promoting the benefits of electric vehicles, advertising free charging (while applicable) and positive charging etiquette.
- Engage realtors to include “EV Ready” description on real estate listings. To position electric vehicle infrastructure as an added “feature” and connect current and future electric vehicle drivers with real estate opportunities that meet their needs.
- Set up an electric vehicle “Knowledge Hub”. A one stop shop to provide information and resources on a variety of electric mobility topics including rebates and funding applications support, public charging stations network locations and map, resources on workplace charging infrastructure and more.
- Support multi-residential buildings (condo boards/property owners) in electric charging station installations. Provide support by sharing resources and information on funding support to install chargers, studies on the benefits of installing charging infrastructure and guides.
- Right to charge legislation. Educate the community on existing [legislation](#) to support current and future electric vehicle drivers in meeting their charging needs.

- Continue to host electric mobility events. Building on the success of MEET Burlington with Plug N Drive, explore opportunities to partner with local organizations to host other electric mobility events. Tailored electric mobility “days” can be considered targeting specific sectors of the community with several focus areas, such as a commercial fleet themed day, a charging infrastructure and equipment demonstration and an e-micro mobility focused day.

Other feedback:

- a) Equity and Accessibility. It was noted during stakeholder engagement that equity and accessibility must be considered when reviewing and assessing charging infrastructure needs and challenges in addition to purchase rebates. The affordability of installing charging infrastructure in multi-residential buildings will vary depending on the demographics of the building tenants and / or condo unit owners. Additionally, it is important to ensure equitable distribution of charging infrastructure – particularly at accessibility parking locations. Directing purchase rebates to vulnerable communities was supported by many stakeholders to reduce the price of electric vehicles and make them more accessible, in addition to realizing the reduced maintenance and total cost of ownership benefits.
- b) Safety Concerns: a potential public safety risk that was identified was how quiet electric vehicles are to the extent that they may not be heard approaching. The federal government is proposing [amendments](#) to the Motor Vehicle Safety Regulations that all hybrid and electric vehicles produce a minimum level of noise. The amendments are expected to take effect in 2023.
- c) Loss of revenue from the gas tax. While it is expected that the transition to electric vehicles will accelerate the loss of revenue from the gas tax, there are other factors contributing to this loss including the vast improvements in vehicle fuel efficiency over the past several years and behavioural factors such as the growing number of young adults who live in highly urbanized areas and drive less and the growing number of retirees who generally drive less as they age. A 2019 [report](#) from the Residential and Civil Construction Alliance of Ontario (RCCAO) provides alternatives for revenue sources to offset the decline in the gas tax. Options include developing a plan to implement road pricing charges on major highways (initially with a network of High Occupancy Toll (HOT) lanes) and cities implementing innovative and dynamic parking levies, particularly in high density urban areas.

D. Feedback on the Electric Mobility Strategy Draft Actions

Informed by community and stakeholder feedback, in addition to best practices from leading municipalities, four action areas were identified to support higher electric mobility uptake in Burlington:

1. Charging Infrastructure and Grid Capacity
2. City Leadership
3. Education and Awareness
4. Equity and Accessibility

Draft strategy actions were released on the Get Involved Burlington engagement platform for public feedback. The opportunity to provide feedback was available between June 17 and July 3, 2022. The public had an opportunity to review the draft actions documents and complete a survey on each action area. There was also an opportunity to provide comments throughout the document.

1. Charging Infrastructure and Grid Capacity Action Area Survey

The survey received 42 responses. 94% of survey respondents agreed with the actions proposed. 4% of respondents disagreed and 2% of respondents were unsure.

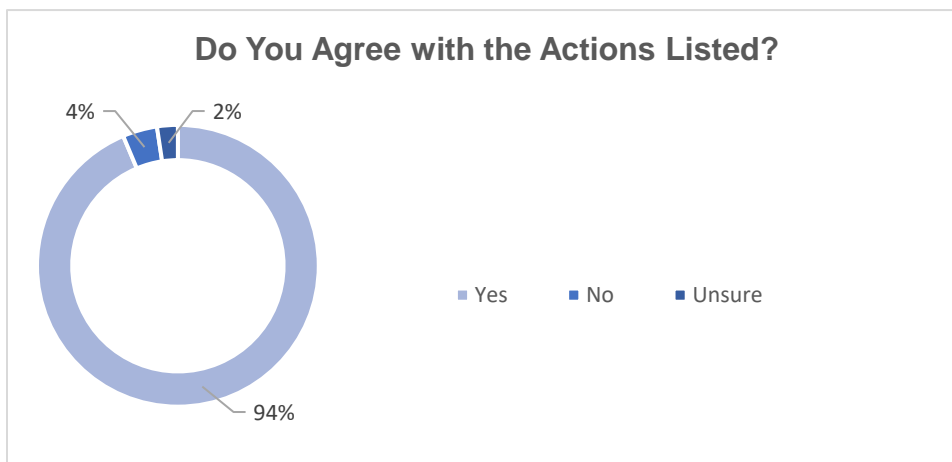


Fig. 54: Do you agree with the actions listed – Charging infrastructure and grid capacity action area. (42 responses)

Survey comments related to Charging infrastructure and grid capacity actions included:

Comment	Response
<p>I like the elements of amending bylaws and ensuring new developments adopt best practices for EVs. However not sure how much "teeth" can be put behind these as provincial gov't owns building codes and has until very recently been hostile to EVs. Anything built in 2022 or later should be EV-ready because there is only 13 years until all new vehicles sold in Canada have to be EV. The infrastructure needs to be available if we are going to be able to meet the requirements of this legislation.</p>	<p>Agree</p>
<p>Ultimately private sector should take the lead in providing charging for EV users. Focus on generation of electricity so there is supply available for EVs as Burlington's fleet grows. Agree with the idea of facilitating charging of scooters / e-bikes, which only require regular electric outlets. Would recommend as part of assessment review potential for e-bike / scooter rental, particularly in Downtown and touristy areas like RBG and the Hamilton / Burlington Beach way.</p>	<p>Many private sector businesses have installed charging stations, which can be viewed on EV charging apps. Agreed – ongoing collaboration with Burlington Hydro is necessary to ensure grid can support EV charging. Thank you for comments related to micro-mobility. There is an action related to exploring bike and scooter share programs.</p>
<p>EV chargers on city property need to be for a fee.</p>	<p>Currently the City is not charging a fee for EV charging as an incentive to accelerate the adoption of EVs in Burlington. This policy will be reviewed on an annual basis.</p>
<p>We can't get a bus north of Dundas St never mind a charging station.</p>	<p>Unfortunately, transit is difficult to service rural areas due to the distance between residences/low density.</p>

2. City Leadership Action Area Survey

The survey received 30 responses. 80% of survey respondents agreed with the actions proposed. 10 % of respondents disagreed and 10% of respondents were unsure.

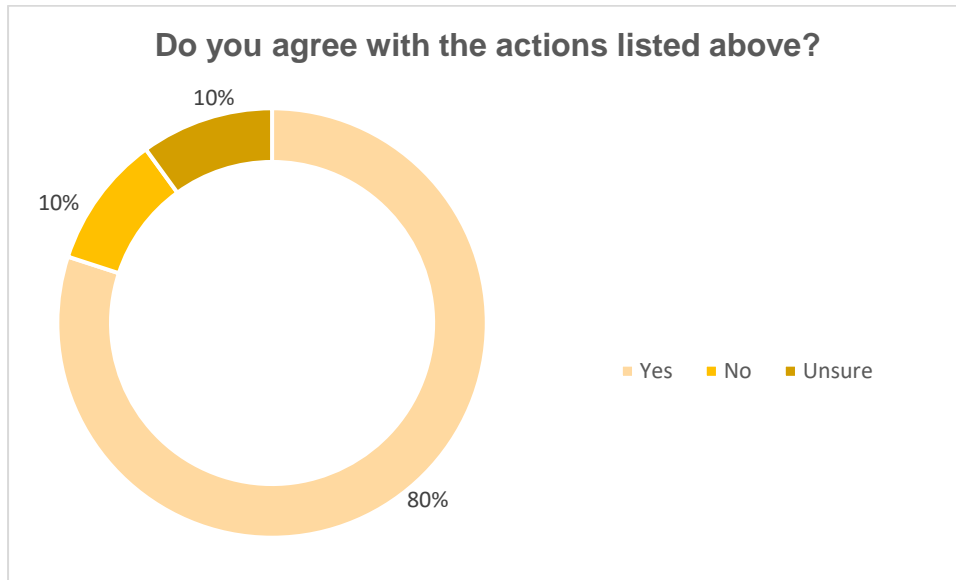


Fig. 55: Do you agree with the actions listed – City Leadership action area. (30 responses)

Survey comments related to City leadership actions included:

Comment	Response
Advocacy should not only be for large battery powered vehicles such as cars & trucks, it should also offer heavy incentives for smaller, less powerful vehicles with lower environmental impact (e-bikes, e-scooters). Also, Burlington needs to get its bylaws ready to allow these types of vehicles to be used as alternatives to car travel alongside non-electric bicycles/scooters. e-Bikes such as e-cargo bikes used to carry kids to school or provide deliveries should be able to be used on multi-use paths for example.	Agree, which is why electric micro mobility options such as e-bikes and e-scooters were considered as the strategy was developed. Electric micro mobility also relates to the work that is being completed by the City through the development of the Integrated Mobility Plan and related Cycling Plan. More information can be found on getinvolvedburlington.ca/IMP .
Why are Hydrogen fuel cell initiatives not included in your strategy?	The focus of this Strategy is on light duty vehicles. Given senior government policies to support electric mobility, it made sense

	for the City to develop an ‘Electric Mobility Strategy’. Hydrogen fuel cell technology makes sense for heavy duty/fleet vehicles. Burlington Transit is assessing the feasibility of this technology for its bus fleet with funding from the Federation of Canadian Municipality with support from CUTRIC (Canadian Urban Transit Research and Innovation Consortium).
Why are we attempting to bring more car-sharing (i.e., Uber / Lyft) into the City?	This is beyond the scope of the Electric Mobility Strategy.
Bike sharing would be great, if we had more places to safely bike. Major traffic arteries are presently missing dedicated bike lanes (ex: Lakeshore, New Street) or they're only on one side of the street (Fairview). I don't think efforts to lure bike-sharing operators will be very successful until we have more safe spaces to effectively commute via bike.	City Council endorsed the new Cycling Plan in 2021, which will support the work to complete the Integrated Mobility Plan. The IMP has a focus on moving people and not vehicles, as was traditionally done in the past. A plan to support safe and effective active transportation infrastructure will be a key part of this work.
Increasing municipality demand for electric vehicles will reduce supply for consumers already in short supply.	On the flip side, demand for municipal fleet EVs could also ensure manufacturers increase supply of EVs.
If e-bikes are going to be promoted to low income populations, then they need to have access to secure, outdoor parking (both at home and throughout the city). E-bikes will be very attractive to thieves and cannot be safely stored indoors. More than a subsidy, people need to be sure that their investment will be safe and secure.	Agreed – an action has been included in the strategy related to exploring the safe and secure parking storage for electric micro mobility options. Fear of theft was raised as an issue in the community survey.
The City should electrify the fleet only when it makes the most financial sense. Due to the high emissions associated with manufacturing a vehicle, it is not beneficial to the environment to retire even an ICE vehicle before the end of its useful life. Additionally, as EVs are supply constrained, there is no reason for the city to accelerate its purchase: any vehicle that Burlington manages to buy just results in another vehicle that isn't purchased elsewhere. As	The City will coordinate replacements through its approach to asset management, when vehicles are identified to be replaced based on certain criteria, such as lifecycle, repairs, mileage, etc. The City faces similar supply challenges that everyone who is purchasing EVs. However, transitioning to a low to zero emission fleet is becoming more important as we need to reduce our carbon footprint.

the financial benefits of EVs are linearly correlated to their environmental benefits, allowing the market to determine when the city or any other entity purchases an EV will maximize both financial and environmental outcomes.	
Unsure if EVs only means cars? if so, we need more advocacy for other mobility options - electric bikes, scooters, etc. Electric cars aren't going to make our city better.	Electric vehicles (light duty) and electric micro mobility options are being addressed in the Electric Mobility Strategy.

3. Education and Awareness Action Area Survey

The survey received 25 responses. 80% of survey respondents agreed with the actions proposed. 4 % of respondents disagreed and 16% of respondents were unsure.

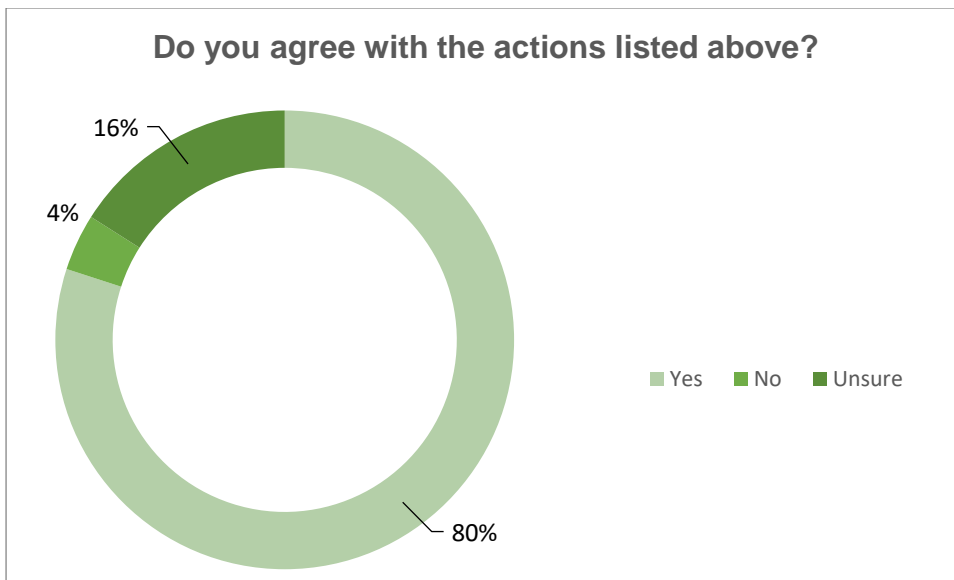


Fig. 56: Do you agree with the actions listed – Education and awareness action area. (25 responses)

Survey comments related to Education and awareness actions included:

Comment	Response
Branding should be simple and consistent with what we already do for city vehicles. Don't spend any additional money on branding.	Agreed – the City already has some branding for low and zero emission vehicles, which will be reviewed and improved if necessary.

	Vehicle decals can be produced in-house in the City's sign-shop at low cost.
Partnership with EV manufacturers / service providers in the knowledge hub would support more effective use of City resources.	Agreed – collaboration will continue to be key with a variety of stakeholders. Plug'N Drive is an excellent partner who has great connections with EV manufacturers.
Focus city resources on making the city safe and welcoming to the use of e-bikes / scooters which will reduce overall vehicle use, while working with business / private sector on implementing the programs for larger electric vehicles.	Agreed - City Council endorsed the new Cycling Plan in 2021, which will support the work to complete the Integrated Mobility Plan. The IMP has a focus on moving people and not vehicles, as was traditionally done in the past. A plan to support safe and effective active transportation infrastructure will be a key part of this work.
Ensure cost of marketing efforts matches benefits.	Will do – key performance indicators are being developed to track EV adoption in Burlington.
It might be useful to consider how to prevent non-EV cars from parking in limited EV dedicated spots.	Already done – the City can fine vehicles who are essentially ICEing (internal combustion engines) an EV parking spot and not plugged in.
What about incentives to local residents to acquire EV? This could come in the form of tax cuts or other. Maybe this can be considered.	It's challenging for local municipalities to provide direct incentives to support EVs. The City is already indirectly incentivizing EVs by not charging a fee at its EV charging stations (unless a parking fee applies).

4. Equity and Accessibility Action Area Survey

The survey received 25 responses. 84% of survey respondents agreed with the actions proposed and 16% of respondents were unsure.

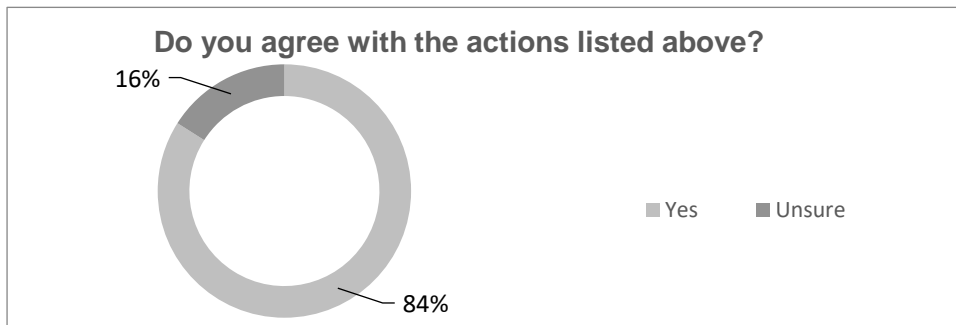


Fig. 57: Do you agree with the actions listed – Equity and accessibility action area. (25 responses)

Survey comments related to Equity and accessibility actions included:

Comment	Response
<p>Agree, but the idea of what is considered equitable in the context of EV use would benefit from clear definitions, ideally aligned with overall EV strategy goals. It's unclear what is meant by under-represented communities, and this should be clearly defined. If those communities include racialized communities, those in rental accommodations, or those living in low income or that are experiencing barriers to vehicle ownership of any type, engagement campaigns and promotional materials would be less likely to support transition to EVs. It would be more important and effective to clearly define what is meant by under-represented communities, distinguish between different communities or groups, and identify the barriers that exist that may be preventing their transition to EVs. Then an assessment about what the most appropriate actions might be to take can be identified that may go beyond simply engagement and promotion - which may not be effective in addressing systemic barriers. I.e., there may be a non-trivial amount of people in under-represented communities that know about EVs and would be very interested in using or buying one, but they cannot afford a vehicle of any kind, or they live in accommodations that prevent them from using a full sized EV or storing a micro-sized EV. Engaging with them or promoting the use of EVs is not likely to change their circumstances such that positive changes would be seen in terms of the numbers or percentage of people in these communities using EVs.</p>	<p>Agreed - you have raised a number of good issues here that must be considered as the Electric Mobility Strategy is implemented. It will take a lot of collaboration with external stakeholders, the Region and senior levels of government. There will be an annual review and reporting on the implementation of the strategy and equity and accessibility will be top of mind.</p>

<p>I'm not sure lack of information is the issue with transition to EVs. It seems to be more a pricing issue (very expensive now that provincial rebate is no more), lack of stock (there are large wait lists to get a reasonably priced EV), and lack of infrastructure (ex: my building does not have EV charging capacity, and there is nowhere in my neighbourhood to charge). I would suggest working on these basic elements prior to doing any promotional campaigns, unless they are directly tied to new EV infrastructure developments in a neighbourhood.</p>	<p>Unfortunately, the supply of EVs is out of our hands, but as more governments mandate a transition to EVs and demand increases, it is expected that supply will follow. The recent increase in fuel costs is also likely driving demand for EVs and other sustainable modes of transportation. Retrofitting multi-residential buildings is expensive, which is why Burlington supports the implementation of 'publicly available' EV charging stations to meet demand from and provide alternatives for this sector.</p>
<p>Developing materials to promote to underrepresented communities is fine as long as there are no incentives to purchase EVs using taxpayer funds.</p>	<p>Currently there is no proposal/related action for the municipality to provide direct incentives for EVs.</p>

General comments on the proposed draft strategy actions were also submitted and are included here with a response:

Comment	Response
<p>Not impressed by the level of communication on this topic. I only heard about this from a forwarded Facebook post. Surely this needed a much greater level of publicity?</p>	<p>Information about the development of the strategy was promoted through the city's getinvolvedburlington.ca webpage, a one stop shop for all engagement activities at the city. Blog posts were published in March and June on takeactionburlington.ca related to the strategy. Members of council and other organizations like the BurlingtonGreen and the Bay Area Climate Change Council shared the information widely on their social media platforms.</p>
<p>Depending on the amperage, level 2 can charge between 30 and 60+ km/hr. Level 3 charging speed is dependent on the Kw density. Currently, level 3 chargers can range from 50 Kw up to 350 Kw, and at 350 Kw some EVs can go from 0 to 80% in as</p>	<p>Agree - There are different levels/rates of charging depending on the type of vehicle and charger.</p>

<p>little as 18 minutes, with initial rates of charge as high as 1500 km/hour.</p>	
<p>I am not sure if this is the right place to put it but since the adoption of EVs by more than 50% of the population will take some time I think the city should put in place an action plan to educate and enforce the NON Idling bylaw which apparently nobody knows it exists and you can see all the time large ICE vehicles, specially contractors and city contractors, idling for long periods of time. That should stop.</p>	<p>Information on the city’s anti-idling program can be found on Burlington.ca/environment. Enforcement of the bylaw is on a complaints basis – reports of excessive idling can be made through city@burlington.ca.</p>
<p>The Fast Charge systems are really dependent on the power. A 50kwh charger will charge most vehicles to 80% in an hour, but a 150 or 300 kwh charger are much faster with some able to charge most vehicles in as little as 10 minutes. Nobody wants to wait an hour for a charge but if they know of faster options, they may reconsider.</p>	<p>Thank you for the feedback on fast chargers which will be considered as the City plans for and installs fast chargers. City staff do work closely with Burlington Hydro to consider power capacity requirements to install chargers on city property.</p>
<p>Is this enough leadership? Should the city also not be promoting more access to charging stations in malls, condominiums, apartment buildings, ...? Leadership should be broader than city owned properties.</p>	<p>There is an action in the Electric Mobility Strategy related to encouraging charging in multi-residential buildings. Some commercial properties are already taking the initiative to install chargers for the public such as IKEA, Mapleview Mall and Burlington Centre.</p>
<p>There needs to be leadership with housing e.g., condos, apartments to encourage supporting EV charging. Perhaps the City could work with hydro or Reliance on this.</p>	
<p>Would like to see what's actually being done in this regard - I live in a condo and we've had no approach or communication from the municipality regarding this.</p>	
<p>Either it is “free” with paid parking or not and needs to be advertised accordingly. I tried to use the “free charge” in the Locust</p>	<p>To sign up with 3rd party charging companies, they often require a credit card on file with your account with a small</p>

<p>lot today and it is a ChargePoint charger, so an additional fee was required. The city needs to be a leader in promoting access to affordable charging and there should not be double fees.</p>	<p>amount of money to cover future charging where there is a fee for charging. The City does not charge for time at its charging stations so you should not receive a charge against your ChargePoint account for using a City charger.</p>
<p>The free charging initiative is admirable, but it may act as a disincentive for multi-residential buildings to actually press ahead with EV charging capability installation - the up-front cost of this is significant on a per-user basis so why would the building proceed when free charging is available at a minor inconvenience?</p>	<p>The City is providing free charging currently to help accelerate the adoption of EVs in Burlington. This policy will be reviewed and assessed annually. Public chargers are often the only option for residents in multi-residential buildings due to the high cost of retrofitting existing buildings to install charging infrastructure.</p>
<p>One thought on charger deployment - not sure where this would go. Southampton provides free charging 30' from an intersection with angle parking to the chargers. Very challenging for some EV users who need to back in given the proximity to the intersection and traffic etc. To be safely used, propose all new charger parking spots are perpendicular to the roadway. Even Port Elgin's that are parallel parking require some users to spin around facing the wrong way to charge.</p>	<p>Thank you for the comment and advice. At this point, because the City has a number of parking lots in the downtown core, most charging stations will be installed in these locations – several are already available. Vehicles have the option of driving or backing into locations, depending on where their charging port is located on their car.</p>
<p>I'd suggest that any 'exploration' action should have a short-term timeline (1-2 years). Starting to think about opportunities 2-5 years from now doesn't align well with the required decarbonization timelines -- considering all the implementation activities that need to follow, once exploring and selecting an opportunity to pursue.</p>	<p>An annual review and report on progress will take place on the implementation of the strategy, which will include assessing the prioritization and timing of actions.</p>
<p>Level 2 chargers are fine for workplace charging or for locations where extended periods of parking is intended, in order to allow meaningful levels of charging. The city</p>	<p>The city is assessing the need and feasibility of installing level 3 chargers – one is under development for the downtown core.</p>

<p>needs to significantly increase the availability of level 3 charging to encourage the adoption of EVs by those who live in condo or apartment buildings that have not yet been retro fitted to allow for 'in-house' charging.</p>	
<p>Beyond incentivizing chargers themselves, consider incentives for upgrading electrical (panel) capacity. This may be a joint program with other electrification initiatives such as replacing gas stoves or installing heat pumps. In addition, work with Burlington Hydro to ensure they have the capacity to take on the work in a timely manner. Last I checked, lead time was 3-5 months. Residents looking to upgrade from 100A to 200A will need to spend ~\$6,000, if required.</p>	<p>Good suggestion. Staff are working on a business case to implement a home energy efficiency retrofit program to focus on fuel switching by supporting the installation of air source heat pumps. It is hoped that the program can be expanded one day to support solar and EV chargers.</p>
<p>Why is this not a short term priority?</p>	<p>Timing was agreed to with Halton Region staff as a regional EV strategy has not begun yet.</p>
<p>It's all very well working with BESI, but they are also marketing their charger solution for condos, in competition with other providers whose technology and cost may be significantly better than BESI's. You need to avoid giving BESI a commercial advantage.</p>	<p>Agreed – the document has been updated and BESI (Burlington Electricity Systems Inc.) has been removed as a lead on some actions.</p>
<p>Note that this will only benefit places where individual metering capability for dwellings exists - this excludes many condos where the electrical billing is bulk.</p>	<p>Burlington Hydro can assist apartment buildings/condo buildings for opportunities which best suit the needs of the facility.</p>

List of Figures

Fig. 1: Do you currently lease or own a plug-in electric vehicle?	pg. 4
Fig. 2: Distribution of EV ownership in Burlington	pg. 4
Fig. 3: What type of home do you live in?	pg. 5
Fig. 4: What is your age range?	pg. 5
Fig. 5: Which of the following best describes your total household income last year, before taxes, from all sources for all household members?	pg. 6
Fig. 6: Approximately how much do you drive every day?	pg. 6
Fig. 7: How important is fuel economy to you when considering what vehicle to purchase or lease?	pg. 7
Fig. 8: Which of the following describes your knowledge of plug-in electric vehicles?	pg. 7
Fig. 9: Which of the following have you experienced? Check all that apply.	pg. 8
Fig. 10: Has the pandemic had any impact on your decision to what vehicle to get or when to get it?	pg. 8
Fig. 11: If yes, how?	pg. 9
Fig. 12: How satisfied are you with your plug-in electric vehicle?	pg. 10
Fig. 13: What is the range of your plug-in electric vehicle?	pg. 10
Fig. 14: Approximately how much do you drive every day?	pg. 11
Fig. 15: What are the top plug-in electric vehicle ownership challenges you face? Check all that apply.	pg. 11
Fig. 16: Which of the following attributes (if any) encouraged you to purchase / lease a plug-in electric vehicle?	pg. 12
Fig. 17: Which of the following attributes (if any) would most encourage you to purchase a plug-in electric vehicle? Select up to 3 choices.	pg. 13
Fig. 18: What would an acceptable range for your plug-in electric vehicle be if you were to own or lease one in the future?	pg. 14
Fig. 19: Which government programs if enacted, would most likely increase your interest in purchasing or leasing a plug-in electric vehicle? Please select your top 3 choices.	pg. 15
Fig. 20: How much (if any) are you willing to pay for a plug-in electric vehicle with more or less the same functionality as a gas powered vehicle?	pg. 15
Fig. 21: Which of the following attributes, if any, are holding you back from purchasing or leasing a plug-in electric vehicle? Choose all that apply.	pg. 16
Fig. 22: Which statement best describes your thoughts on buying or leasing a plug-in electric vehicle?	pg. 17

Fig. 23: Where do you do most of your charging?	pg. 18
Fig. 24. How important is it that the electricity used in a plug-in electric vehicle come from emission free energy?	pg. 18
Fig. 25: How Trustworthy are the following sources of information on electric plug-in vehicle options / choices?	pg. 19
Fig. 26: Please indicate your level of agreement with the following statements	pg. 20
Fig. 27: Please indicate your level of agreement with the following statements.	pg. 21
Fig. 28: Do you currently own an electric bike?	pg. 25
Fig. 29: What type of home do you live in?	pg. 25
Fig. 30: What is your age range?	pg. 26
Fig. 31: Which of the following best describes your total household income last year, before taxes, from all sources for all household members?	pg. 26
Fig. 32: Which of the following describes your knowledge of electric bikes?	pg. 27
Fig. 33: How satisfied are you with your electric bike?	pg. 27
Fig. 33: What are the top electric bike ownership challenges you face? Check all that apply.	pg. 28
Fig. 34: What are the reasons you bought your electric bike?	pg. 28
Fig. 35: Has your electric bike replaced your car for any of the following?	pg. 29
Fig. 36: Approximately how much do you cycle on an average trip?	pg. 29
Fig 37: If you already have an electric bike, would you recommend one to a friend or family member?	pg. 30
Fig. 38: Which of the following attributes (if any) are holding you back from purchasing an electric bike? Choose all that apply.	pg. 30
Fig 39: If you are concerned about electric bike theft, choose the options that would make you more comfortable parking your electric vehicle in a publicly accessible location.	pg. 31
Fig. 40: Which statement best describes your thoughts on buying an electric bike?	pg. 32
Fig. 41: Do you currently own an electric scooter?	pg. 34
Fig. 42: What type of home do you live in?	pg. 34
Fig 43: What is your age range?	pg. 35
Fig. 44: Which of the following best describes your total household income last year, before taxes, from all sources for all household members?	pg. 35
Fig. 45: Which of the following best describes your knowledge of electric scooters?	pg. 36
Fig 46: What are the top electric scooter ownership challenges you face? Please choose your top 2.	pg. 36
Fig. 47: Has your electric scooter replaced your car for any of the following?	pg. 37
Fig 48: What are the reasons you bought your electric scooter? Select all that apply.	pg. 37

Fig. 49: Approximately how much do you travel on your electric scooter on an average trip?	pg. 38
Fig. 50: Which of the following (if any) would most encourage you to purchase an electric scooter?	pg. 39
Fig. 51: Of the following attributes, which, if any, are holding you back from purchasing an electric scooter? Check all that apply.	pg. 39
Fig. 52: If you are concerned about electric scooter theft, would the following make you more comfortable parking your electric scooter in a publicly accessible location?	pg. 40
Fig. 53: Which of the following statements describes your thoughts on buying an electric scooter?	pg. 41
Fig. 54: Do you agree with the actions listed – Charging infrastructure and grid capacity action area.	pg. 50
Fig. 55: Do you agree with the actions listed – City Leadership action area.	pg. 52
Fig. 56: Do you agree with the actions listed – Education and awareness action area.	pg. 54
Fig. 57: Do you agree with the actions listed – Equity and accessibility action area.	pg. 55