

Electric Vehicles: Plugging in with Behavioural Insights

Designing a behaviourally informed marketing communication strategy to promote electric vehicle incentives



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Behavioural Economics
in Action at Rotman



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1. Executive Summary

Electric vehicles (EV) are not only great for the environment, they are instrumental in the shift to a low-carbon economy. When consumers (or “buyers”) undertake the journey of purchasing a new vehicle, their decision is affected by several behavioural barriers that keep them from making a choice that is both financially prudent (for the individual) and environmentally desirable (for the society as a whole) – i.e., to invest in an EV over a conventional gasoline vehicle. These barriers have been responsible for the very low rate of adoption of EVs in Canada – less than 1% of passenger vehicles on Canadian roads are EVs, despite three of the country’s largest provinces all having instituted a comprehensive EV incentive program.

Based on a review of the existing literature as well as insights uncovered in interviews with buyers and dealerships, as well as BEAR’s design sessions, we understand that the behavioural insights driving a potential buyer’s decision to purchase an EV are directly linked to two critical questions that he/she is confronted with: “Why should I buy an EV?,” and for those who have already made a decision to purchase an EV, “What should I do now?”

Answering the “Why should I buy an EV?” question is often made difficult by buyer perception of EV technology as new and foreign. Comparisons with gasoline vehicles are further made confusing by considerations such as battery range, charging infrastructure, and governmental purchasing incentives. In addition, the difficulty in understanding or calculating exactly how much an EV can help buyers save (in gas money per year) can make it hard to justify paying the higher price tag for an EV today. As well, without the influence of peers, family, and a community of satisfied EV owners, buyers may feel less inclined to join in. Even buyers that have made a decision to purchase an EV (i.e., those trying to answer the “What should I do now?” question) face barriers in understanding the next steps, such as finding the closest dealership to test-drive an EV or figuring out how to apply for a government rebate.

BACKGROUND

EVs are the clear better choice for many consumers and the environment for a variety of reasons

Three largest Canadian provinces have financial incentives to make EVs attractive for buyers

THE PROBLEM

Buyers in Canada are not purchasing/adopting EVs as quickly as expected (despite incentives)

BEHAVIOURAL INSIGHTS

revolve around 2 questions facing buyers

(Before deciding on what vehicle to purchase)
1. WHY SHOULD I BUY AN EV?

(After deciding to purchase an EV)
2. WHAT SHOULD I DO NOW?

1. Executive Summary (contd.)

These barriers, when analyzed through the lens of behavioural economics, reveal several opportunities for “behaviourally informed” interventions that have the potential to help make it easy and attractive for buyers to purchase an EV. This was further corroborated by examples of “best practices” from organizations and programs that have successfully improved the adoption of EVs in their geographies or regions. For example, California’s DriveClean website presents a wide array of EV model options, a clear presentation of purchase incentives, as well as a checklist to guide choice and give buyers ownership of the decision process. EV Norway’s website shows models with a simple sorting criteria in addition to an integrated EV charging map with an option to plan your journey. Within Canada, Quebec’s official EV program includes a separately branded public charging network called the Electric Circuit. Finally, Ontario’s Plug ‘N Drive website incorporates many behaviourally informed design principles that could easily be integrated with the province’s EV Incentive Program (EVIP).

Based on our research, we recommend that a behaviourally informed communication strategy for any EV incentive program must **promote all aspects of owning an EV through a well-designed, behaviourally informed communication channel** – such as a website. This website must use **loss framing to communicate the long-term benefits of owning an EV**. For instance, the monetary value of the benefits could be framed as a “loss” that could be incurred with the purchase of a conventional gasoline vehicle in the long run. Additionally, these benefits could be made more salient with the **use of visual cues, such as a speedometer with a red band indicating the lost savings**. We recommend **engaging and incentivizing recent EV buyers and EV dealerships to influence potential new buyers through the powerful tool of referrals**. Finally, we recommend using a **uniform branding strategy for road signage and EV charging infrastructure** – in order to improve recall and make it generally more attractive for buyers to own, drive, and charge an EV.

HOW CAN BEHAVIOURAL INSIGHTS HELP?

Promote all aspects of owning an EV through a behaviourally informed/designed website

Communicate long-term benefits of owning an EV through effective visual cues and loss framing

Incentivize and engage with recent EV buyers and EV dealerships to refer potential new buyers

Design a uniform and easily recognizable EV branding for road signage and charging stations

2. Introduction

2.1. Electric Vehicles

Transportation has made a significant contribution to the world's carbon emissions. In Canada, for example, transportation accounted for 24% (173 Mt CO₂) of all greenhouse gas (GHG) emissions, second only behind the oil and gas sector. Within transportation, passenger vehicles contributed nearly 48% (83 Mt CO₂).¹

Electric vehicles (EVs) have received considerable attention in the past several years, as consumers and companies alike increasingly look towards technological innovation for greater environmental sustainability. Compared to conventional vehicles that use petroleum-powered internal combustion (IC) engines, EVs can operate on battery power. The battery, in turn, is charged with electricity from a power outlet. Additionally, fully electric EVs release no tailpipe emissions, compared to cars running on IC engines. While the electricity used to charge an EV could come from any fuel source (that the utility is deriving power from), the net effect of using a rechargeable battery and zero tailpipe emissions make EVs a far more sustainable mode of transportation than conventional vehicles.

Most new EV models being developed by manufacturers are as safe and powerful as comparable conventional IC vehicles – they all go through the same safety certification processes. Battery-powered engines are also quieter than IC engines – this difference can be felt both inside the vehicle as well as outside it. While charging stations for EVs vary based on the speed at which the batteries are charged, charging times are continuously falling as battery technology evolves. Further, the network of EV charging stations (including privately installed and public stations) is growing rapidly across major Canadian cities.

WHY ARE EVs BETTER?

Zero tailpipe emissions (or lower emissions, in case of hybrids)

Cost-comparable to gasoline vehicles (with government rebates)

Significantly more long term savings (zero recurring gasoline costs)

Lower maintenance costs and requirements

Quieter (both inside and outside)

Most new EVs are as safe/powerful as gasoline vehicles

More charging stations are being continuously added

Preferential parking and right to use carpool lanes

In the background:
Tesla Model S – a “luxury” EV

2. Introduction

2.1. Electric Vehicles (contd.)

The common classification of an EV is between a “battery electric vehicle” (BEV) and a “plug-in hybrid electric vehicle” (PHEV). The former is a fully electric battery-powered vehicle with no tailpipe emissions. PHEVs, on the other hand, have an additional IC engine, which typically kicks in after the battery charge is nearly exhausted.

While BEVs are the most environment-friendly option, it is possibly easier to transition buyers from conventional IC vehicles to PHEVs. Even so, there is a possibility that buyers will feel “comfortable” just using the IC engine due to the familiarity associated with it. As a result, we have chosen to focus on BEVs for this study, since we feel that they represent the future of mobility, and that transitioning buyers from conventional IC vehicles to BEVs is the most effective long-term strategy for transitioning towards a low carbon economy.

There is a good variety of EVs offered by many major car manufacturers, with some having a specific brand for EVs. For instance, the Leaf and Bolt are dedicated brands for all-electric BEVs offered by Nissan and Chevrolet, respectively. Over 25 models of EVs are currently available in Canada² at nearly every price point, with more variety available within PHEVs than BEVs.

Currently, there are more than two million EVs on the road across the world. However, EV adoption has been fairly slow in Canada². In 2016, EVs made up just 0.56% of all new vehicles purchased in Canada.² Three Canadian provinces – Ontario, Quebec, and British Columbia – currently have EV incentive programs, offered as a rebate after the purchase of an EV. Mass adoption of electric vehicles (EVs) holds the potential to lower the transportation sector’s carbon footprint significantly, and to aid in Canada’s transition to a low carbon economy.

LOW ADOPTION

0.56%

**of all new vehicles
sold in Canada in 2016
were EVs**

In the background:
Nissan Leaf – a “mid-market” EV

2. Introduction

2.2. Behavioural Economics

Behavioural Economics (BE) is a field of study that bridges the psychology of human behaviour with economic decision-making. The fundamental concept underlying BE is the distinction between “humans” and “econs.”³ Econs are essentially rational individuals, who are assumed to have perfect self-control, and are expected to weigh in the payoffs and tradeoffs before making a certain decision or choice. However, research has shown that humans do not necessarily act rationally, are unsure of their preferences, and are often likely to pick the “easiest” option available to them. They are also often influenced by the context in which the choices are presented or the decision that needs to be made.

This irrationality, however, is predictable to some extent, and can be used in constructive ways to facilitate better decision-making. This is particularly powerful in solving “last mile” decision problems – that is, in helping us devise tactics that can facilitate the adoption, implementation, or take-up of new products, services, or programs.⁴

The adoption of EVs in Canada is a perfect last mile problem, since the technology, market, and necessary policy/programs are all in place. Yet, adoption remains low due to several barriers or bottlenecks in the customer “journey map” – that is, decision-making process that makes a potential vehicle buyer into an EV buyer.

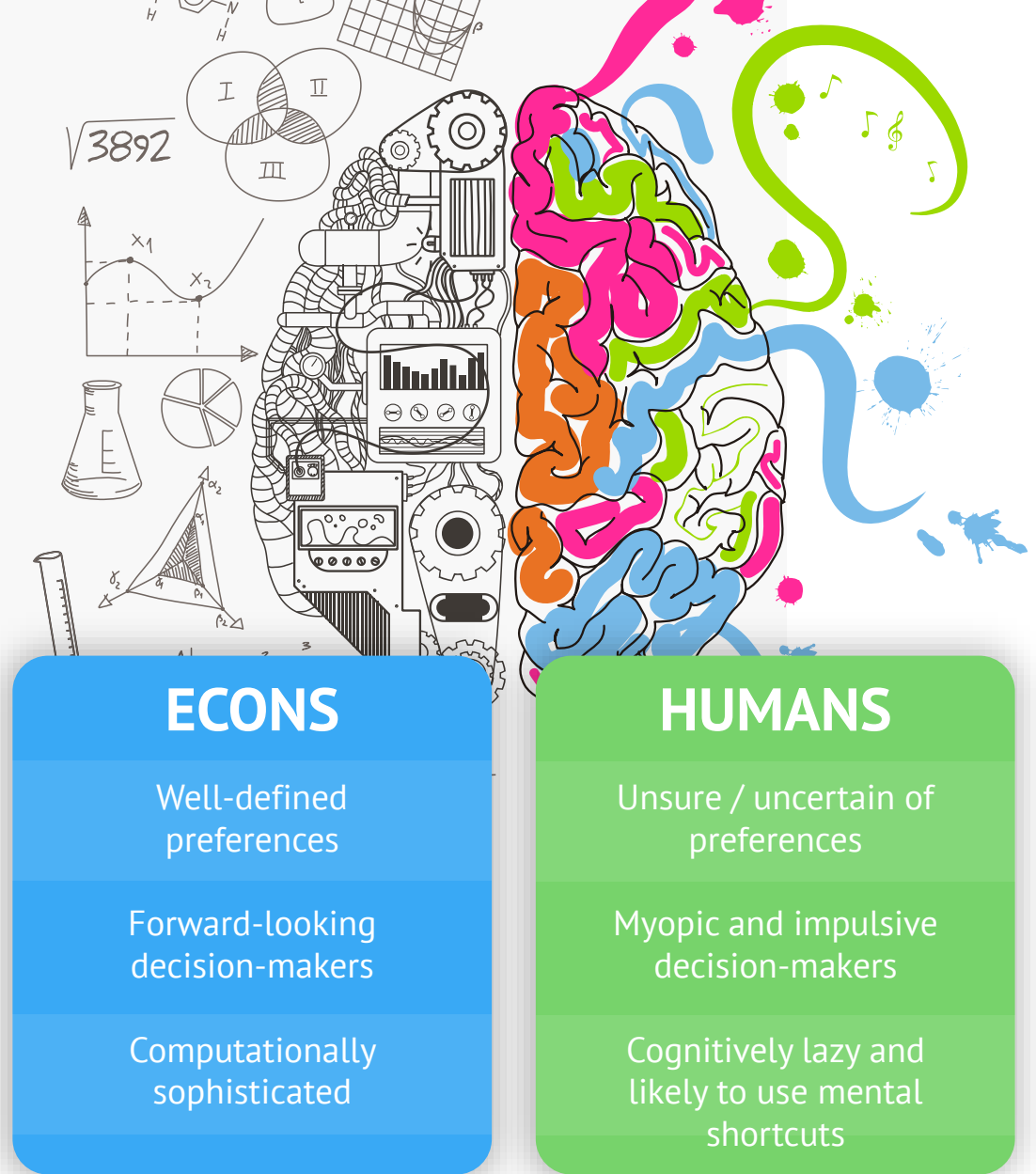


Image created by Freepik

2. Introduction

2.3. BEAR



Behavioural Economics
in Action at Rotman

Behavioural Economics in Action at Rotman (BEAR) is a research centre at the Rotman School of Management, University of Toronto. BEAR conducts leading-edge academic and practitioner-oriented research and helps our partners accomplish behaviour change through designing behaviourally informed and practical interventions. BEAR also engages in a variety of educational and outreach activities. Our focus is on providing solutions that preserve freedom of choice but guide people toward better decisions. We are solving “last mile problems” to improve societal well-being and business profitability. Core to the BEAR philosophy is scientific testing, and we are dedicated to randomized controlled field and laboratory trials as methods of delivering measurable results.



Photo by Mohsin Bin Latheef

2. Introduction

2.4. Study Objective and Methodology

Sustainability is an area where there is tremendous opportunity for inexpensive interventions designed to simply “make it easy” for users to perform environment-friendly actions. Further, in light of the low adoption of EVs in Canada, BEAR decided to review various EV promotion and government-led financial incentive programs from around the world and to propose a behaviourally informed communication strategy for governments and organizations interested in promoting their current or upcoming EV incentive programs to potential EV buyers.

Work on this document was conducted over the summer of 2017, and comprised a mixture of secondary research, user/expert interviews, and design sessions. The latter are essentially brainstorming sessions with experts and potential EV buyers, where we used the tools of “business design” to understand the motivations and barriers for potential buyers purchasing an EV. The sessions were successful in helping us identify significant bottlenecks in the EV “customer journey map” that could be solved through adequate behavioural interventions.



3. Journey Map for EV Buyer

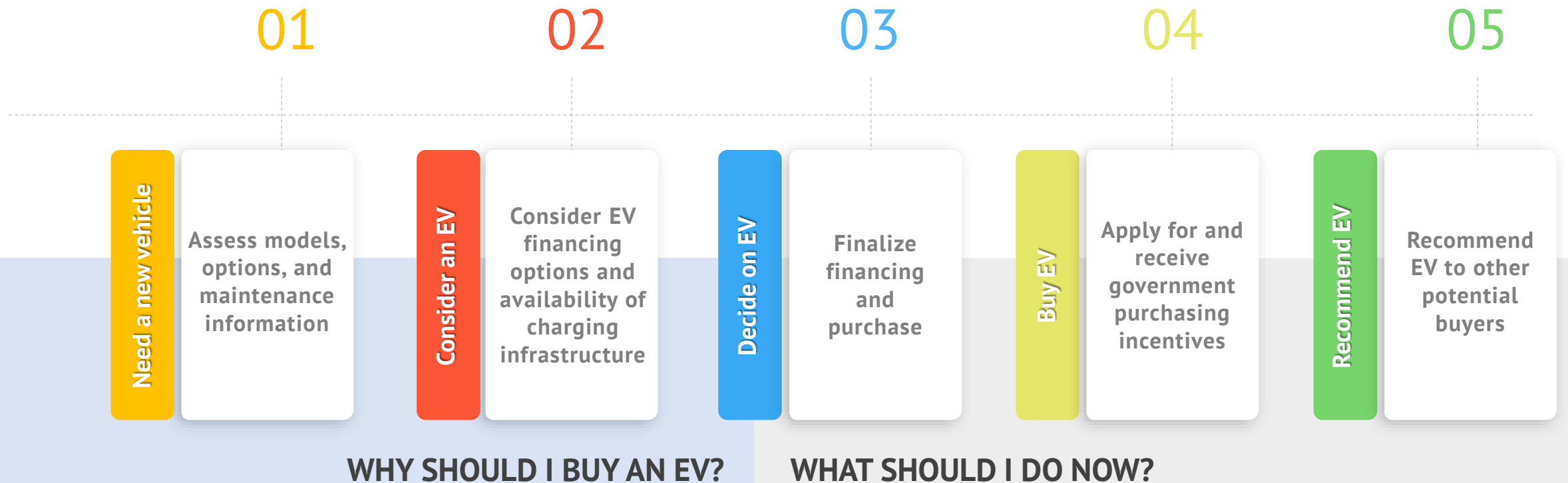
Based on our research and user interviews, we have attempted to depict the five major steps in a vehicle buyer's interaction with EVs, which is essentially made up of two stages:

Need a new vehicle	STAGE 1: WHY SHOULD I BUY AN EV? <ol style="list-style-type: none">1. Assess models, options, and maintenance information2. Consider EV financing options and availability of charging infrastructure
Decide to purchase an EV	STAGE 2: WHAT SHOULD I DO NOW? <ol style="list-style-type: none">3. Finalize financing and purchases an EV4. Apply for and receives government purchasing incentives or rebates5. Recommend EV to other potential buyers

While there may be multiple outcomes and drop-off points at each point along this journey, for brevity's sake we focus on the progression of a successful journey map in which a customer moves through each stage and achieves the desired outcome of purchasing an EV.

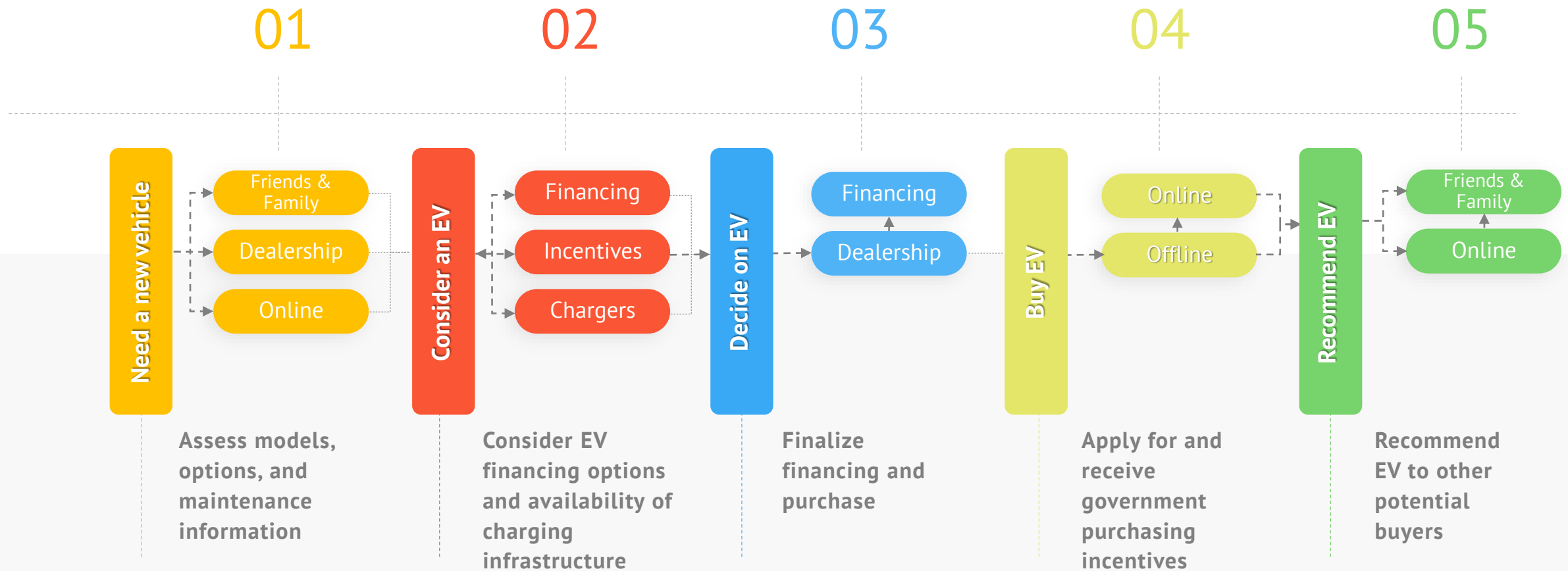
3. Journey Map for EV Buyer

3.1. Major Steps



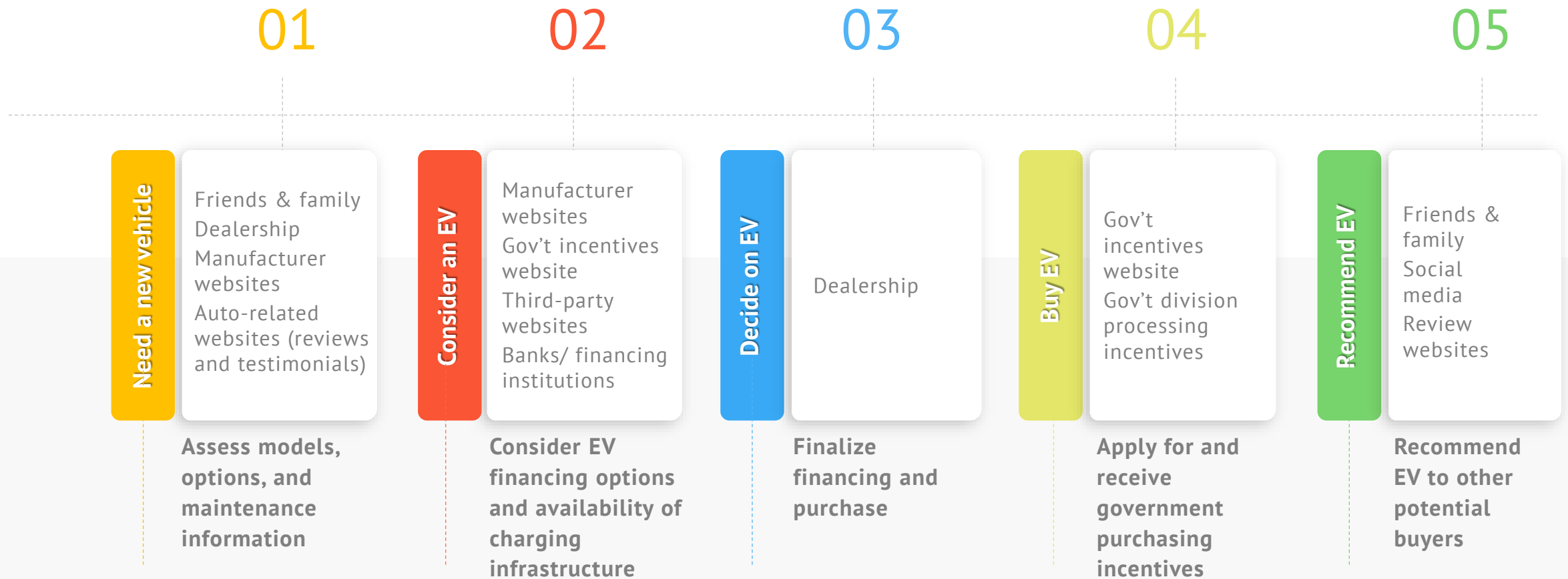
3. Journey Map for EV Buyer

3.2. Key Considerations Within Each Step



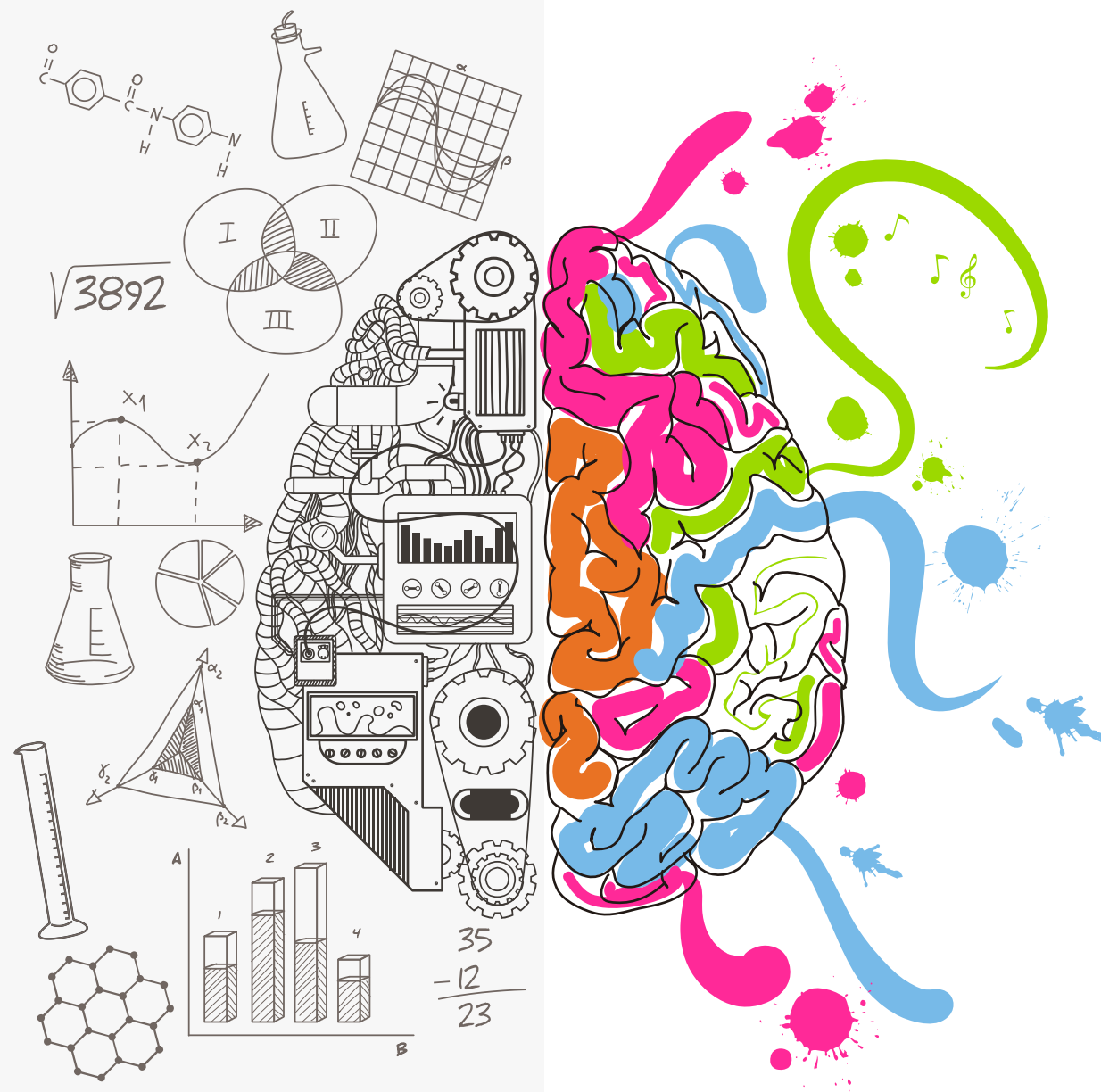
3. Journey Map for EV Buyer

3.3. Key Touchpoints Within Each Step

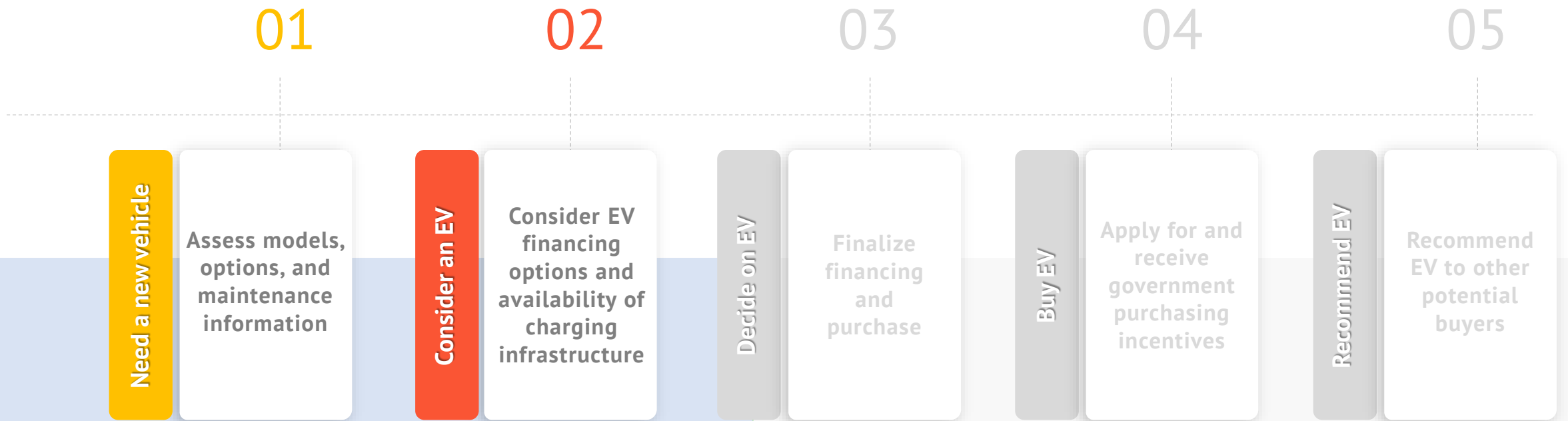


4. Key Behavioural Barriers

While developing the EV buyer's journey map, we uncovered multiple behavioural phenomena/barriers at play at various stages, some of which are "bottlenecks" to EV purchase. These can be broadly categorized under the two questions introduced earlier. In this section, we explore the behavioural phenomena/barriers specific to each of these questions.



4.1. Key Behavioural Barriers: Why Should I Buy an EV?



WHY SHOULD I BUY AN EV?

- AMBIGUITY (AB)
- ANCHORING EFFECT (AE)
- PRESENT FOCUS (PF)
- STATUS QUO BIAS (SQB)

WHAT SHOULD I DO NOW?

- CHOICE OVERLOAD (CO)
- NO DECISION POINTS (NDP)
- ACTION-INTENTION GAP (AIG)

4.1. Key Behavioural Barriers:

Why Should I Buy an EV? (contd.)

AE

ANCHORING EFFECT (AE)

Definition: when users rely too heavily on the first piece of information they are given when making a decision.⁵

Example: shoppers who find higher priced items early on in shopping trip are more likely to purchase comparatively cheaper items later on.

In the case of EV purchase: if we give more information to buyers about annual cost savings of EV, they may rely on that information and be more inclined to buy.

AB

AMBIGUITY (AB)

Definition: when “users prefer options with known probabilities over those with unknown probabilities”⁴

Example: people may order the same thing at a restaurant rather than trying something new out of fear of the unknown.

In case of EV purchase: buyers may not want to purchase an EV since it is relatively new technology and their general lack of knowledge about it makes it less attractive. Additionally, buyers may not want to purchase an EV due to **range anxiety**, which is a driver’s concern about the lack of mileage and unfamiliarity with on-the-road refueling of an EV compared to a gas-powered car.

PF

PRESENT FOCUS (PF)

Definition: when users prefer a smaller reward today over a larger reward in the future.⁵

Example: people tend to prefer \$100 today to \$110 in two days. However, when asked to choose between \$100 in 30 days or \$110 in 32 days, people tend to prefer the latter.

In case of EV purchase: buyers tend to be focused on the higher cost of EV today so the perceived cost savings of a gas car seems more attractive. The long-term annual gas savings by switching to EV is often unknown to them and can help combat this bias.

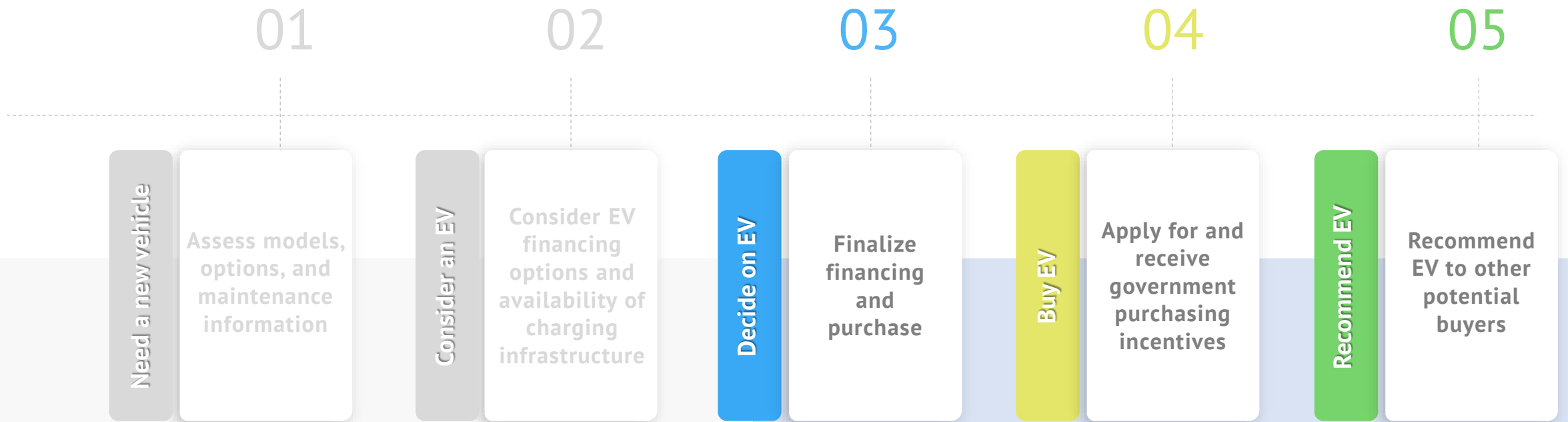
SQB

STATUS QUO BIAS (SQB)

Definition: when users prefer to stick with a decision previously made. People feel worse about bad outcomes from doing something new than from inaction.⁶

In case of EV purchase: When buying a vehicle, buyers tend to stick with the status quo – that is, the comfortable choice of buying a gasoline vehicle rather than an EV.

4.2. Key Behavioural Barriers: What Should I Do Now?



WHY SHOULD I BUY AN EV?

- AMBIGUITY (AB)
- ANCHORING EFFECT (AE)
- PRESENT FOCUS (PF)
- STATUS QUO BIAS (SQB)

WHAT SHOULD I DO NOW?

- CHOICE OVERLOAD (CO)
- NO DECISION POINTS (NDP)
- ACTION-INTENTION GAP (AIG)

4.2. Key Behavioural Barriers:

What Should I Do Now? (contd.)

AIG

ACTION-INTENTION GAP (AIG)

Definition: action-intention gap is the discrepancy between the user's intention to behave or perform a certain action and actual behaviour.

In case of EV purchase: a recent study found that 55% of consumers are willing to pay more for products and services provided by companies that are committed to positive social and environmental impact, but only a fraction of this population actually follows through on their sustainability intentions.⁹

CO

CHOICE OVERLOAD (CO)

Definition: when faced with many options, users often have difficulty in making a decision due to their finite mental capacity. Example: in a study conducted by Iyengar and Lepper, consumers were given a \$1 coupon to purchase jam – consumers were 10x more likely to purchase when presented with 6 varieties than with 24 varieties.^{7,8}

In case of EV purchase: there are currently more than two dozen models of EVs available to buyers. While this represents only a fraction of the variety of models available for conventional vehicles, the choice overload problem is further amplified by the fact that traditional classification systems used for conventional vehicles may not necessarily apply to EVs. New classification criteria like battery capacity, battery range, eligibility for rebates, etc., can compound the choice overload. Providing well-designed “decision engines” can be an effective way to solve this problem.

NDP

NO DECISION POINTS (NDP)

Definition: when the user is required to make a decision regarding aspects their purchase, but the timing is not made obvious or the choices are not obvious.

In case of EV purchase: when presented with Ontario's EVIP website, participants at BEAR's design session were confused as to how to apply for incentives and what the next steps were.

5. Best Practices

After identifying the various steps in the customer decision-making process and understanding the barriers to EV purchase, we set out to identify “best practices” from around the world on how effectively EV characteristics and government purchasing incentive programs (for purchasing EVs) are communicated to potential EV buyers. While many of these examples may not have been designed explicitly with behavioural economics in mind, we were able to identify “behaviourally informed” design principles incorporated into them.

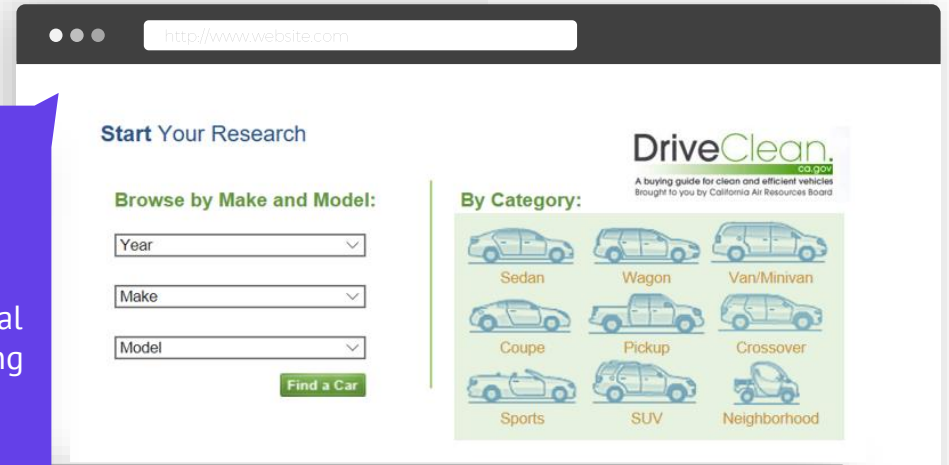
For each best practice identified, we have also mapped the relevant behavioural barriers that have been mitigated (colour-coded circles in lower-right corner).



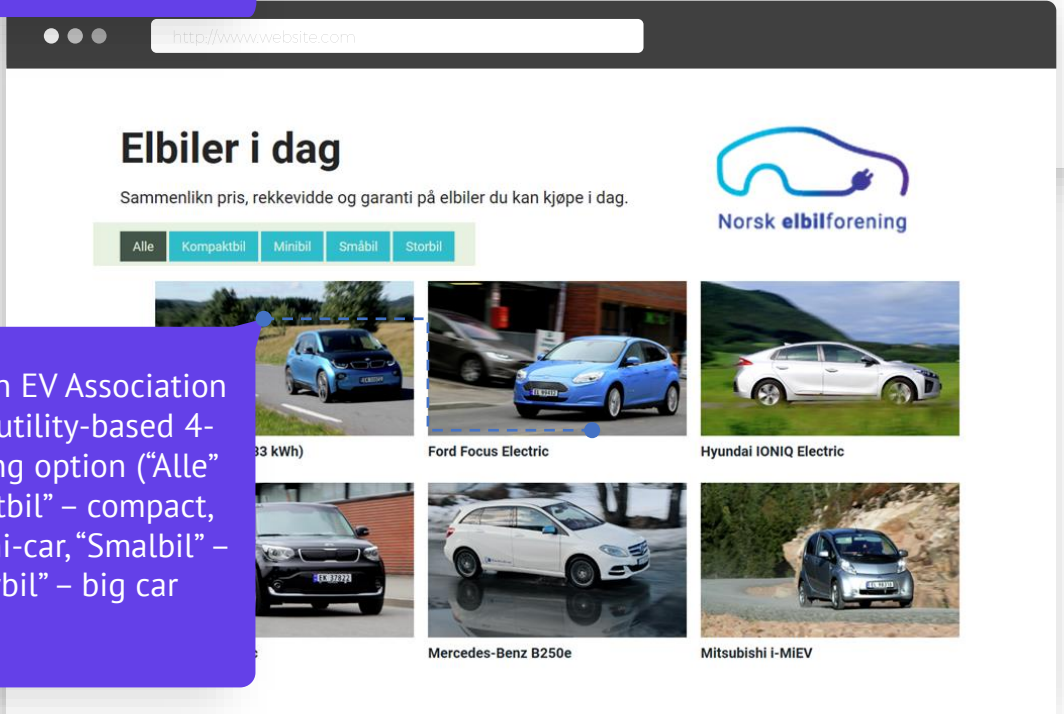
5.1. EV Models: Helping Buyers Decide Easily

- Being able to sort through multiple models and makes of EVs available to potential buyers makes it easy to **overcome choice overload**.
- This also helps with **partitioning** the complex task of purchasing an EV into simpler individual steps, starting with making it easy to just pick a particular model.
- **Simple segmentation criteria** like “primary utility for vehicle” and the use of pictures can help make sorting simpler and easier.
- The websites of Norsk elbilforening (the Norwegian EV Association – a non-governmental organization) and DriveClean (a promotional website set up by the California Environmental Protection Agency’s Air Resources Board) – use these behavioural concepts effectively.^{10, 11}

DriveClean uses a simple set of drawings to help potential buyers visualize the actual cars before clicking on a certain sorting option.

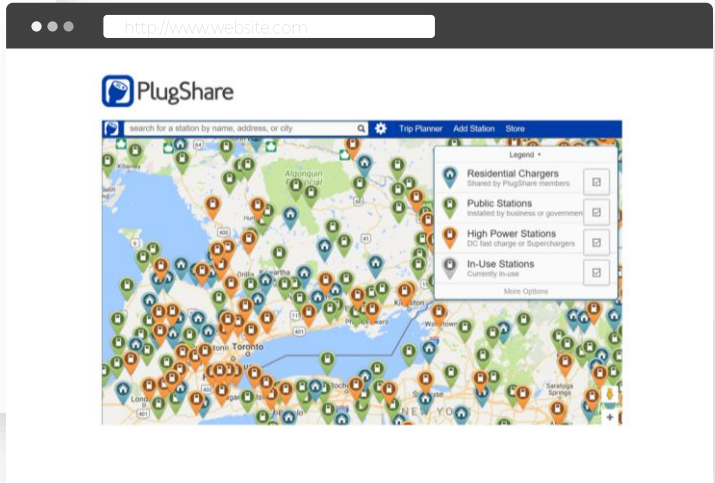
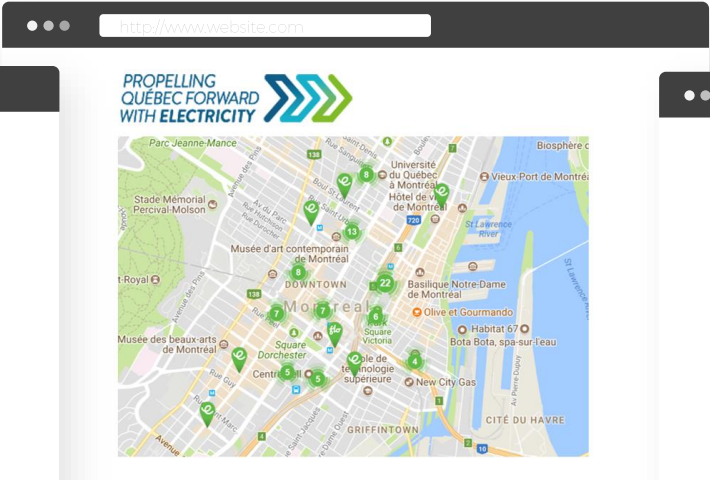
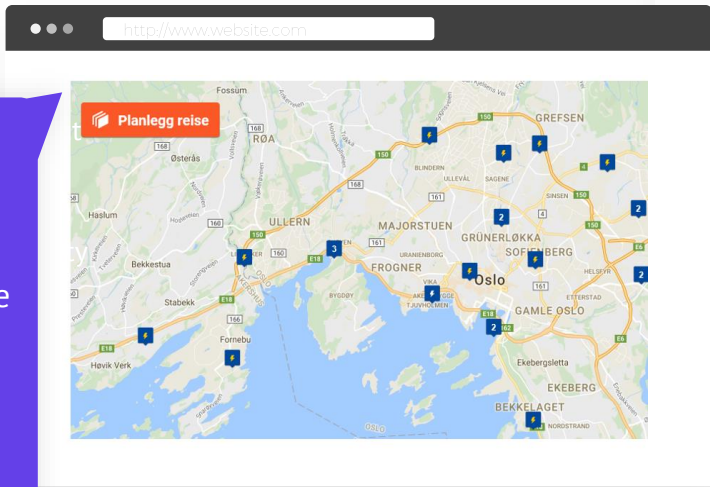


The Norwegian EV Association uses a simple utility-based 4-category sorting option (“Alle” – all, “Kompaktbil” – compact, “Minibil” – mini-car, “Småbil” – small car, “Storbil” – big car (sedan))



5.2. Charging Station Network: Addressing Range Anxiety

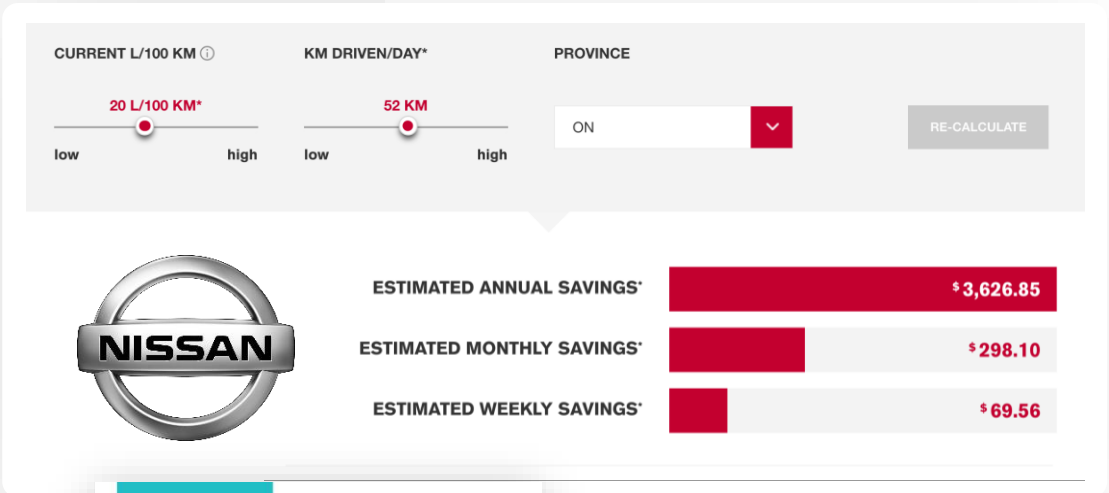
Norsk elbilforening
Plan your trip: a simple but effective addition to the charging station map can help alleviate range anxiety further.



- One of the main concerns for potential EV buyers, aside from the higher upfront costs (which can be addressed by subsidies, rebates, or tax credits), is range **anxiety** – that is, uncertainty around the long-distance diminished capabilities of EVs.¹²
- Research has shown that a **comprehensive charging network** was found to be strongly correlated with EV uptake, more so than even financial incentives.¹³
- The websites of the Norwegian EV Association (Norsk elbilforening), The Electric Circuit (Quebec’s government-backed public charging station network) and PlugShare (a private company that helps EV drivers find and review charging stations in the United States & Canada) are excellent examples of how **visual depiction of a map with charging stations** makes the availability of charging stations more salient/attractive, and helps alleviate range anxiety.^{10, 14, 15}
- These are opportunities for the website of the Ontario EVIP program, which currently lacks an embedded map of charging stations.¹⁶

5.3. Behaviourally Informed Framing

- The websites of both Norway’s EV Association and **California’s DriveClean program** have easily accessible information about the policy incentives and extensive infrastructure that exist for EVs, as well as the annual savings of gasoline as compared to electric charging.^{10,11}
- Plug ‘N Drive (a non-profit that promotes EVs in Canada) makes use of the concept of **“loss aversion”** – that is, the tendency of users to prefer to avoid “losses” rather than acquire equivalent gains.^{4,17} Plug ‘N Drive has used this powerful tool effectively to highlight the “lost value” to buyers when they choose to invest in a gas vehicle rather than an EV.⁴
- Loss aversion tools can be further combined with **anchors** for government financial incentive programs (like rebates) to make the losses seem even more salient and hence tackle present bias towards buying a cheaper gas vehicle.
- Additionally, some EV manufacturers (like Nissan) also have **gas calculators** to show how much money users have saved due to them driving their EVs (like the Nissan Leaf).¹⁸



PLUG 'N DRIVE

Effective use of loss aversion along with anchors (\$1870 compared to \$570) add to the salience of lost savings when buying a gas vehicle rather than an EV.

5.4. Highlighting Non-Monetary Benefits Clearly

- There are several non-payout benefits to driving an EV in many countries. For example, in some countries EV drivers can have free access to parking, bus lanes, and toll roads.¹⁰
- These benefits can add to the overall attractiveness of owning an EV if presented in a clear and simple way.
- The websites of the Norwegian EV Association, Plug 'N Drive, and Ontario's EVIP all have presented these additional benefits well.^{10,16,17}

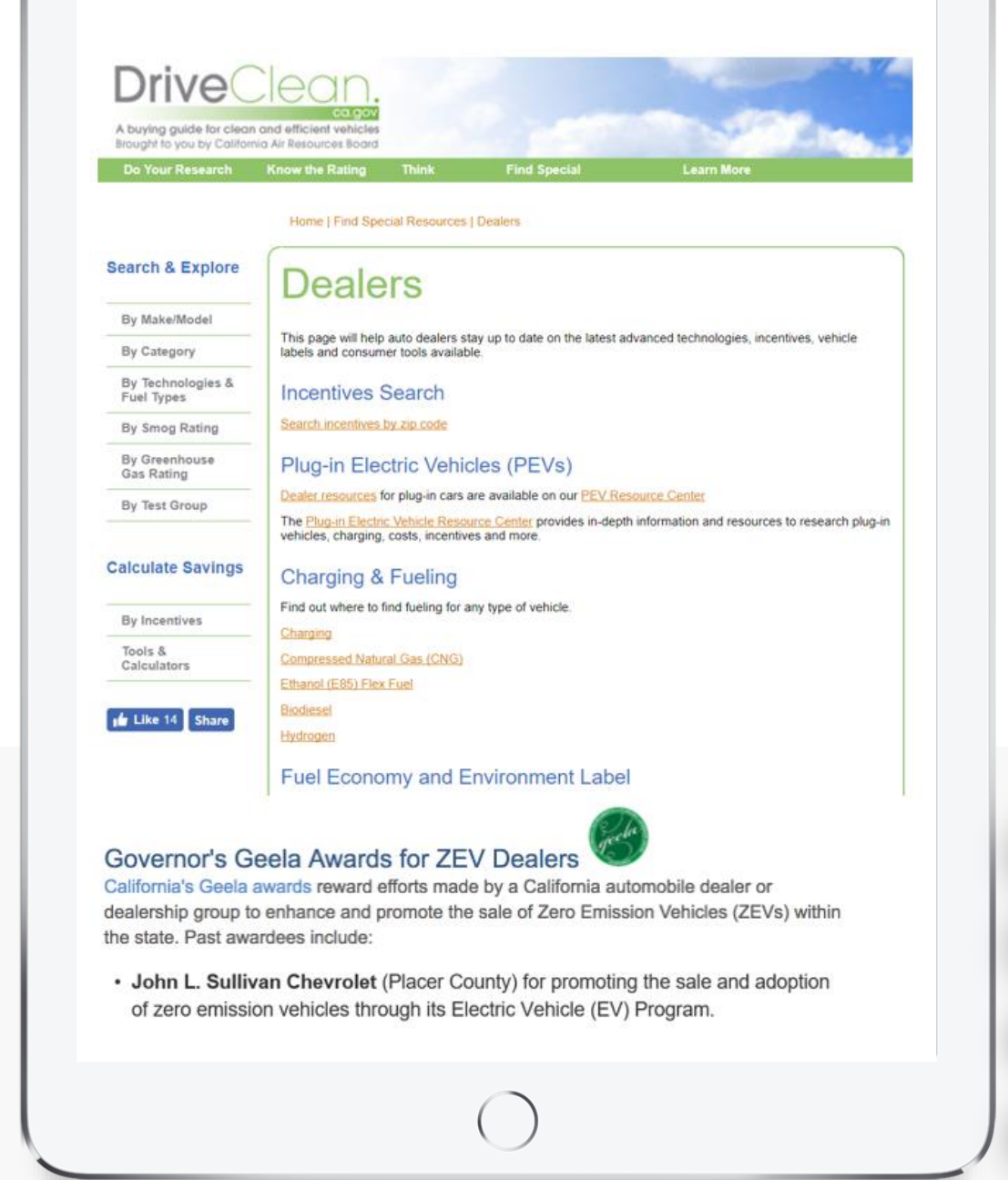
The screenshot shows the website for Norsk elbilforening. The main heading is "Norwegian EV policy". Below it, a paragraph states: "Since the early 1990's the incentive program have been gradually introduced by a broad coalition of different political parties." Another paragraph says: "Norway is leading the way for the transition to zero emission electric cars. In 2015, electric vehicles had a 22 % market share in Norway. This is first and foremost due to a substantial package of incentives developed to promote zero emission cars." A section titled "The zero emissions incentives include:" lists several benefits in a yellow box: "No purchase/import taxes (1990)", "Exemption from 25% VAT on purchase (2001)", "Low annual road tax (1996)", "No charges on toll roads or ferries (1997 and 2009)", "Free municipal parking (1999)", "Access to bus lanes (2005)", "50 % reduced company car tax (2000)", and "Exemption from 25% VAT on leasing (2015)". The Norsk elbilforening logo is visible on the right.

The screenshot shows the Ontario Ministry of Transportation website. The heading is "Why drive an EV?". Below it, it says "With an EV you can:". There are five icons representing different benefits, each with a text box: 1. "Save money. You will use less (or no) fuel and benefit from lower maintenance and operating costs. You can also take advantage of lower electricity rates when you charge at off-peak times." 2. "Get money back. You will receive an incentive of up to \$14,000 (based on the capacity of your new EV's battery capacity, seating capacity and retail price). You may also receive an incentive of up to \$1,000 on a new Level 2 home charging station." 3. "Enjoy green licence plates. These plates identify you as an EV owner and allow you to drive in all provincial high occupancy vehicle (HOV) lanes - even with only one person in the vehicle." 4. "Help make Ontario greener. By consuming less (or no) fuel, you will help reduce emissions of harmful air pollutants and greenhouse gases." 5. "Recharge easily. You can recharge your EV at home or at public charging locations." 6. "Get where you need to go. BEVs can typically travel at least 100 kilometres on a single charge, and PHEVs can generally travel more than 500 kilometres using a combination of battery and gasoline engine technology." The Ontario logo is at the top right.

The screenshot shows the Plug 'N Drive website. The heading is "Benefits of Driving Electric". There are four main sections with icons: 1. "Electric Cars Save You Money!" with a car and lightning bolt icon. Text: "Electricity costs less than gasoline! Especially if you charge over-night or on weekends when the cost of electricity is lowest. By driving an electric car in Canada, you can save \$1,500-\$2,000 per year on fuel." 2. "Electric cars need less maintenance!" with a car and wrench icon. Text: "Electric cars do not need oil changes, coolant flushes, mufflers or exhaust systems, saving you hundreds of dollars per year on maintenance." 3. "Government incentives reduce your upfront cost!" with a car and dollar sign icon. Text: "Ontario, British Columbia and Quebec have government purchase incentives in place, saving you up to \$15,000 off the purchase of your electric car and charging station." 4. "Electric Cars Reduce Emissions" with a car and leaf icon. Text: "The burning of fossil fuels produces hazardous chemicals and greenhouse gas emissions that pollute the air we breathe and contribute to global warming. The only emissions from your electric car are from the generation of electricity. Most of Canada's electricity comes from hydro and nuclear, both low-emitting energy sources, and by driving an electric car in Canada you can reduce your car's emissions by as much as 90%." There are also sidebars: "Electric Cars Available in Canada" with a car and lightning bolt icon, and "Electric Cars Deliver Top Performance" with a car and lightning bolt icon. The Plug 'N Drive logo is at the bottom right.

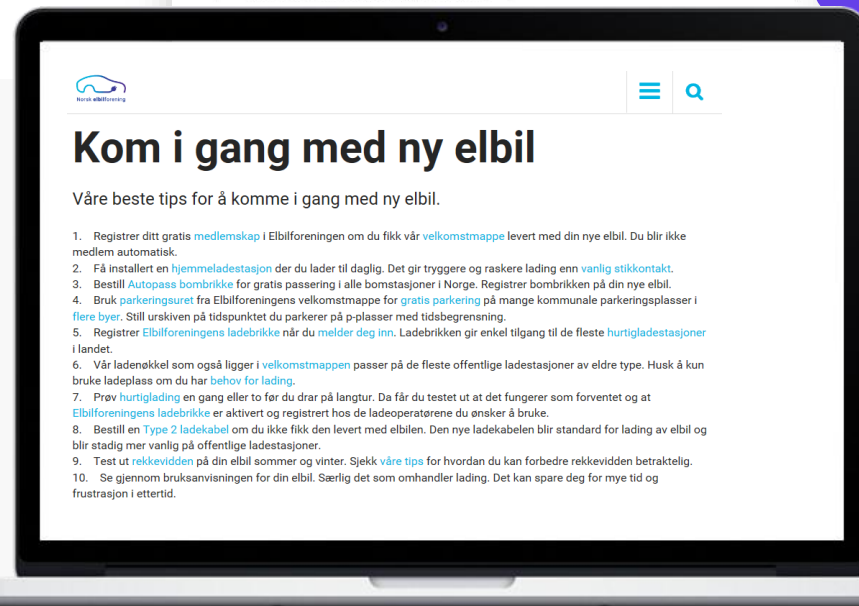
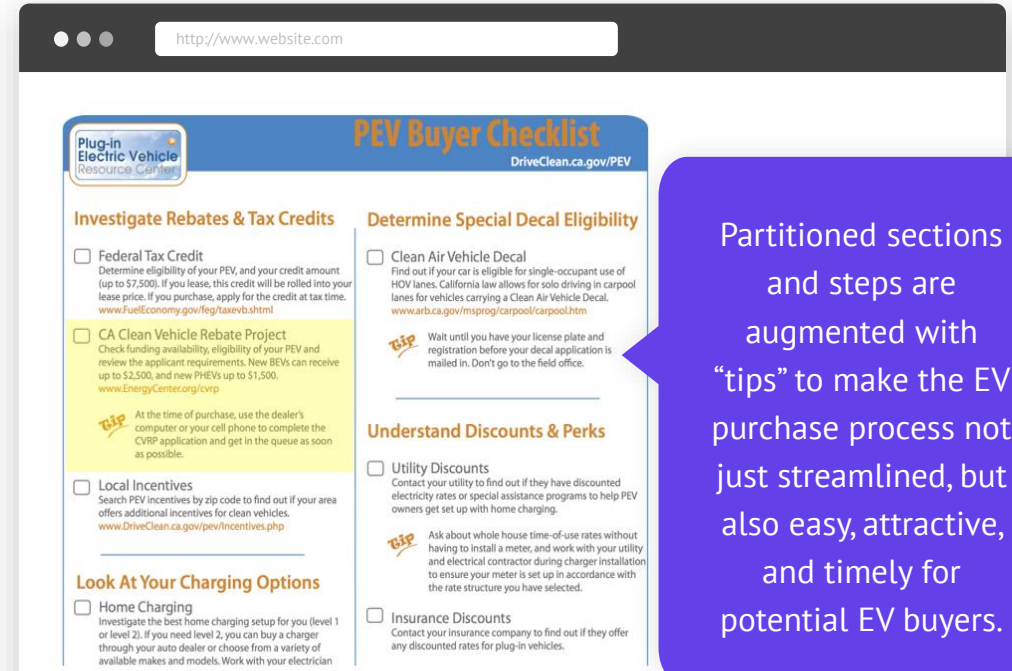
5.5. Changing Behaviour of Dealerships

- ✓ An Ontario study found that salespersons' attitudes about EVs and the presence of EVs at a dealership were key variables affecting whether or not a consumer would purchase an EV.¹⁹
- ✓ The behavioural explanation for this is that users tend to choose the default option, and adding obstacles or “**friction factors**” (like dealerships that are not well-informed about EVs or uninterested in selling them) makes it much more likely that people do not act on any environmental urge or interest in EV that may have existed – that is, **widening the “action-intention gap.”**⁴
- ✓ One best practice we found to tackle this problem is from California, whose DriveClean website has put up **dedicated pages with resources for dealerships.**¹¹
- ✓ Another best practice from California is an annual awards ceremony – the Governor’s Geela Awards for ZEV Dealers – for dealerships that outperformed their peers on EV sales – this uses the behavioural concept of highlighting “**social proof**” – that is, having users (dealerships) compete with each other to make a certain outcome (sell more EVs) more socially acceptable in order to gain favour among the public.^{11, 20}



5.6. Checklists: To Help Buyers Feel Involved in the Process

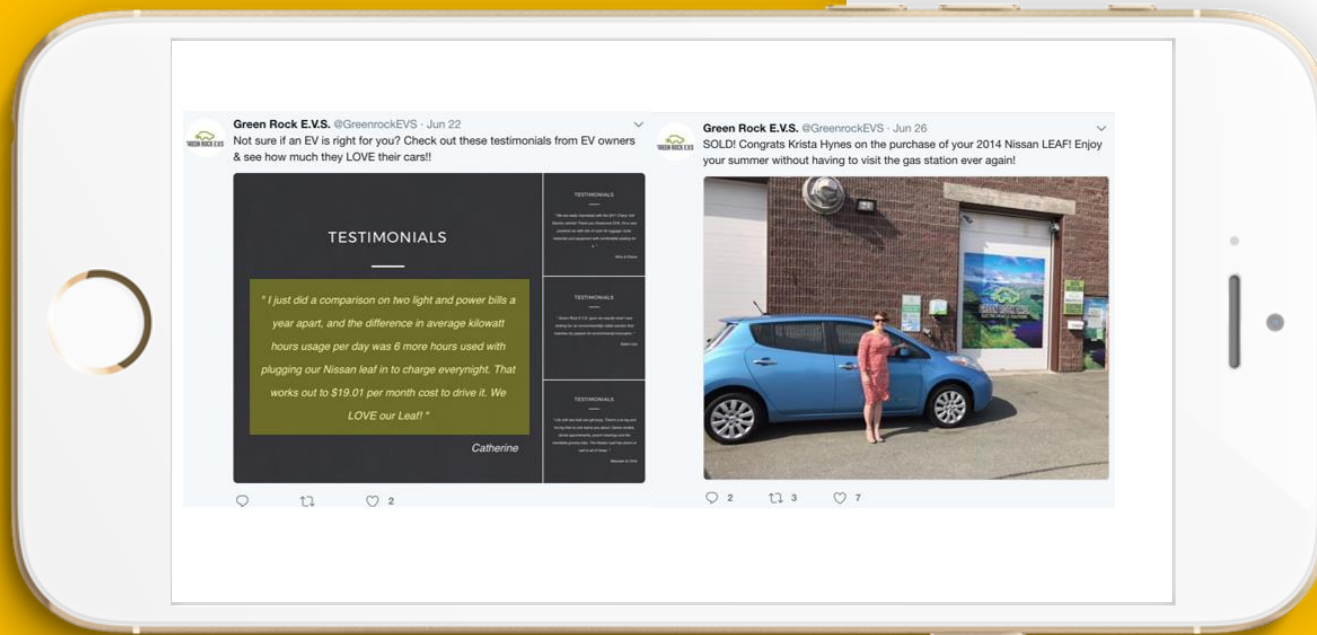
- ✔ **Enhanced active choice** is an approach that prompts users to make a choice between options, rather than simply opt-in or opt-out of the default option.²¹
- ✔ A standard example of enhanced active choice in practice is a **checklist**, where the user is nudged to “feel involved” in the EV buying process. Additionally, checklists also provide users with a sense of **perceived progress**, which when used with **partitioning** (i.e., breaking down complex tasks into smaller steps or portions) can help nudge users towards a desired goal. Additionally, this simple tool also helps individuals **fight status quo bias, tackle the action-intention gap** and “stay on track.”^{22 23}
- ✔ DriveClean California’s “PEV Buyer Checklist” is an excellent example of this as applied to EV purchase, outlining all of the steps that a potential buyer needs to consider when buying an EV in California. It is available both as a downloadable PDF and as an web-based checklist.¹¹
- ✔ Norway’s EV Association website does not have a checklist per se, but uses numbered steps, and has incorporated steps that go beyond just the EV purchase and incentives – such as recommendations for charging, maintenance, and joining EV associations.¹⁰



5.7. Testimonials/ Referrals

- **Testimonials and referrals** are another way to use “**social contagion**” (or “word-of-mouth”) in order to motivate people to conform to a desired choice – when more users talk about or testify to the effectiveness or attractiveness of a certain outcome, they are likely to influence other users to make the same decision.²⁴
- Testimonials and other such services are often effective when giving expert advice, although such success depends on the individuals getting the advice.²⁵
- There are currently very few testimonial and referral programs for EVs administered through government-run channels. Most such testimonials are found on social media (Twitter, Facebook, etc.), especially on channels or groups run by EV enthusiasts, societies, or dealerships.

- Shown to the right are tweets from the twitter channel of Green Rock EVS (a Canadian EV dealer based in Newfoundland and Labrador), showing the testimonials of satisfied customers.²⁶
- The word-of-mouth or social contagion effect could be a powerful tool to integrate into EV promotion campaigns or incentive programs.



5.8. Varying Approaches

Based on our study of various best practices, it is clear that different parties have used differing approaches to promoting EVs and EV incentives.

Even the various government-backed initiatives differ in their marketing approach. For instance, California's DriveClean (government-run) promotes EV models, incentives as well as charging infrastructure. Quebec's official website for promoting EVs promotes the incentives as well as the charging infrastructure (the latter of which is branded and promoted separately as well). However, the website doesn't promote EV models as much.

There are also many other organizations that promote different aspects of EVs. For example, Plug 'N Share is a Canadian non-profit that promotes EV models and incentives through a clean, well-designed website. The website also provides links to other organizations or services that provide charging infrastructure. The EV Association of Norway (a non-governmental group) promotes both EV models and charging infrastructure, including a map integrated into the website, with an option to "plan a trip."

We considered these varying approaches to help us come up with a more integrated and behaviourally informed communication strategy for governments and organizations interested in promoting EVs and/or EV incentive programs to potential EV buyers.



6. Behaviourally Informed EV Marketing Strategy

Based on our study and feedback from design sessions, it is our conclusion that a behaviourally informed marketing strategy for government EV incentives **must promote all aspects of owning an EV:**

- ✓ **EV signage** and **charging stations:** a uniform road signage and branding strategy for charging stations, in order to help increase recall and salience of owning, driving, and charging an EV.
- ✓ **EV models:** providing information on currently available EV models and their features in a simple, easily sortable format.
- ✓ **Incentives:** explaining what monetary (if any) and non-monetary incentives are available to EV buyers, how to apply for them, and using “loss framing” as an effective way to help buyers compare EVs with conventional IC vehicles.*
- ✓ **Referrals and testimonials** from recent EV buyers: to help influence potential new buyers.
- ✓ **Dealerships:** providing information on closest available dealerships (that interested buyers can visit to test-drive an EV), and training or incentivizing dealerships to promote EVs.

**While financial incentives are an effective way to make EVs price comparable to conventional IC vehicles, simple nudging tools like checklists can make these incentives more salient to potential buyers.*

EV Signage

Charging stations

EV models

Incentives

Referrals

Incentivize dealerships

Promote all aspects of owning, driving, and charging an EV

6.1. Key Communication Channels

Website as a Powerful Channel

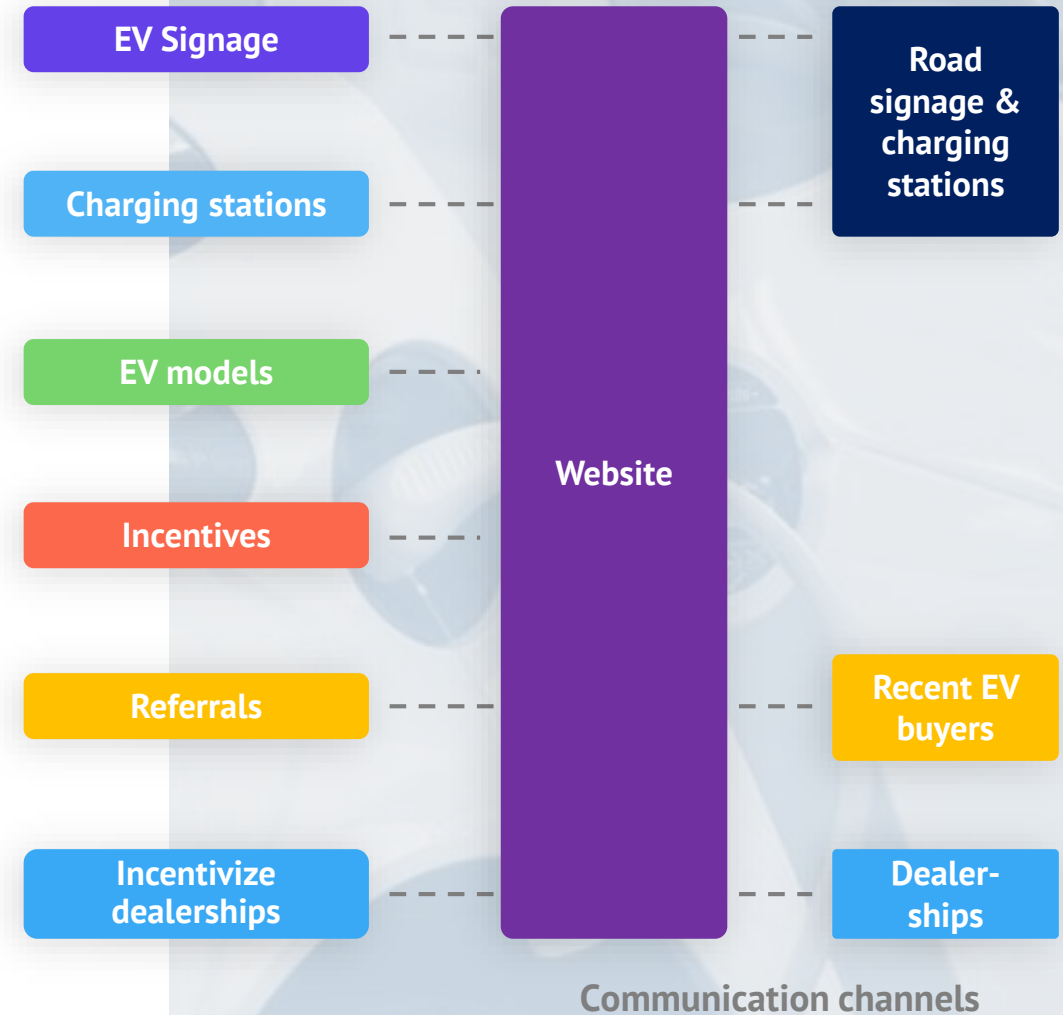
Our research indicates that the most effective communication channel for promoting EVs is a behaviourally informed/designed website – government run or otherwise. While the websites that our team studied in section 5 had their own strengths, we feel that, in order to be fully effective, any website that promotes EV incentives must promote and facilitate all six elements mentioned above. In the next few slides, we present a concept outline for such a website, including the key elements that it must contain, and also a few “policy recommendations” that could make some of the elements more effective.

EV Buyers and Dealerships

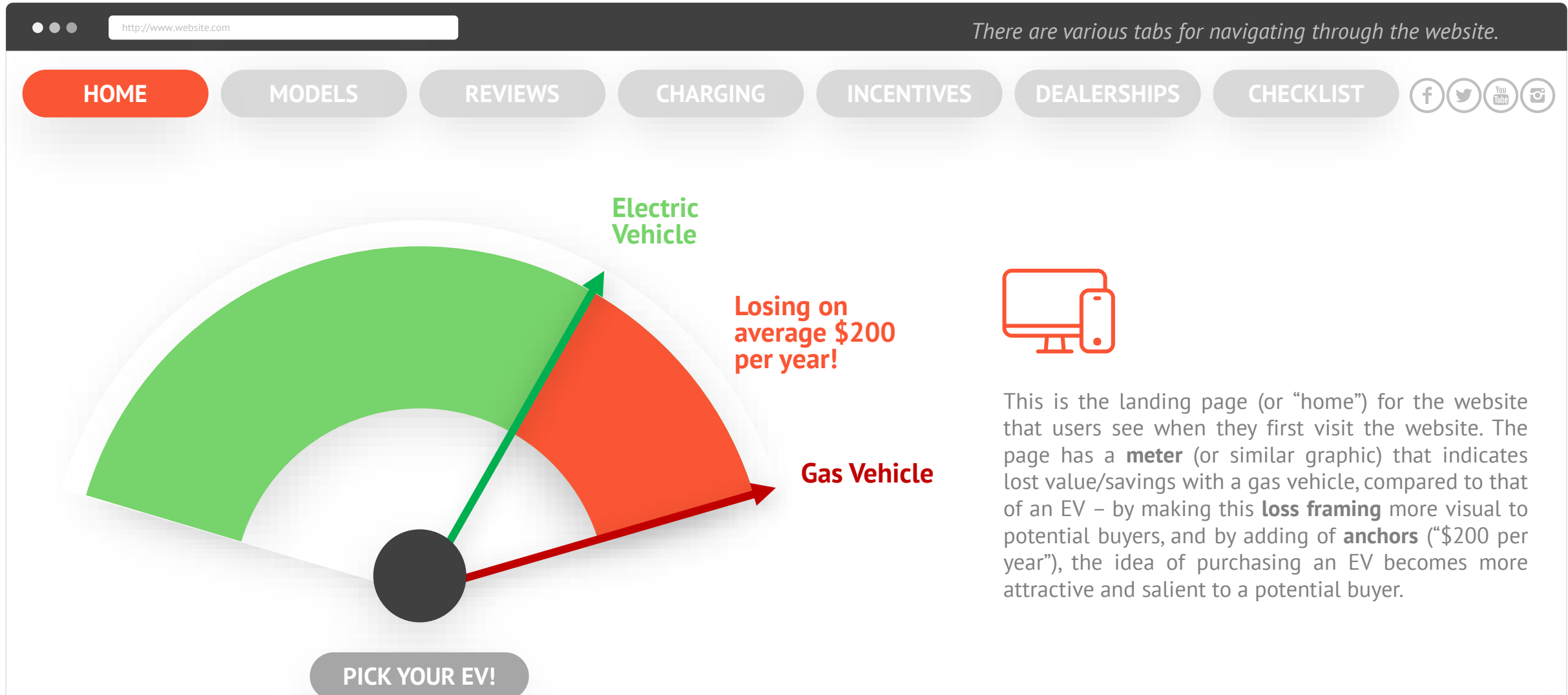
These are two other channels that can actually be effectively engaged through the website itself. Recent EV buyers could come back to the website to apply for the government purchasing incentives (both monetary and non-monetary). In addition, they could leave “reviews” of both the EV that they purchased as well as the dealership that they purchased the EV from. Dealerships on the other hand, could be incentivized to push EVs through “ratings” based on buyer reviews, and by linking up potential buyers to the closest EV dealerships.

Road Signage and Charging Stations

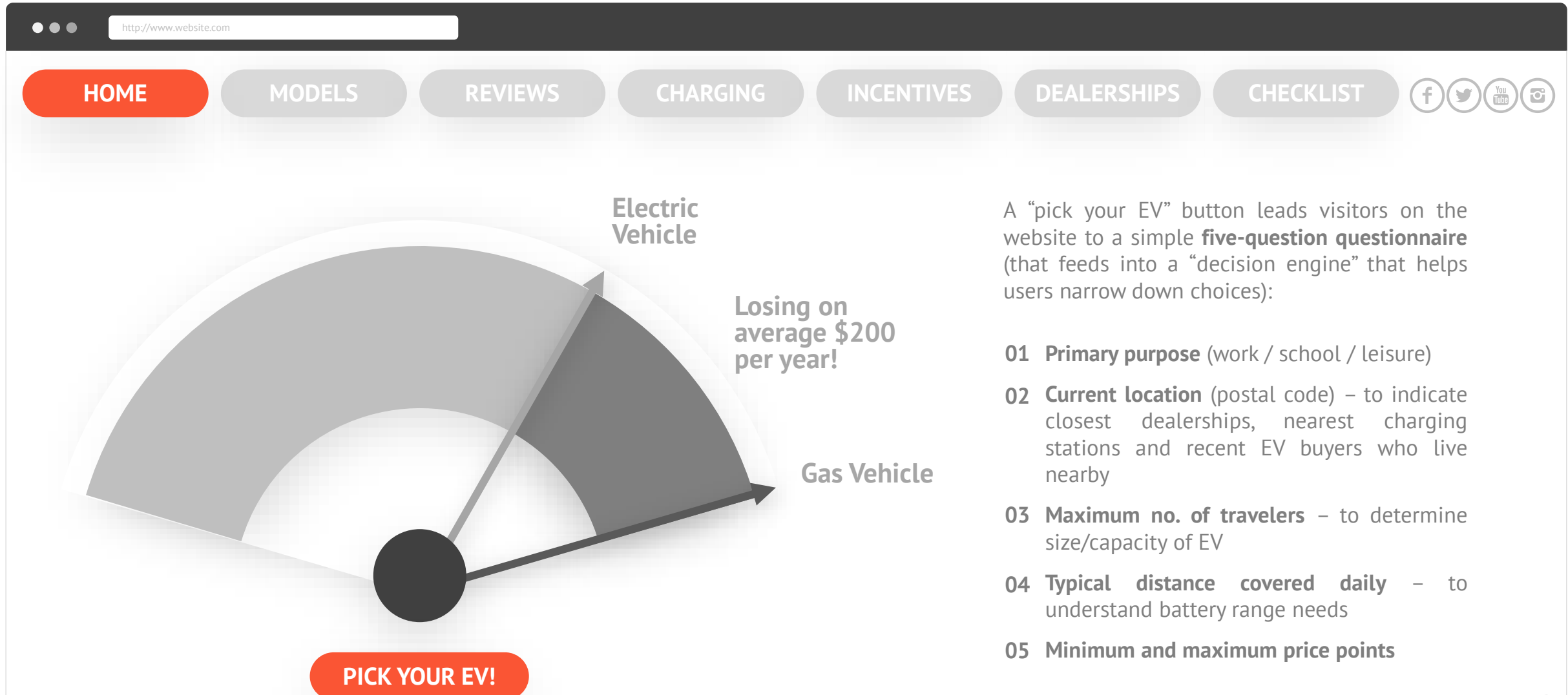
Designing a uniform branding of EVs (such as a universal official symbol for EVs) and prominently displaying this on road signs and charging stations is key to improving recall for EVs among the general public.



6.2. Website Concept Design



6.2. Website Concept Design (contd.)




A “pick your EV” button leads visitors on the website to a simple **five-question questionnaire** (that feeds into a “decision engine” that helps users narrow down choices):


- 01 **Primary purpose** (work / school / leisure)
- 02 **Current location** (postal code) – to indicate closest dealerships, nearest charging stations and recent EV buyers who live nearby
- 03 **Maximum no. of travelers** – to determine size/capacity of EV
- 04 **Typical distance covered daily** – to understand battery range needs
- 05 **Minimum and maximum price points**


6.2. Website Concept Design (contd.)

http://www.website.com

HOME MODELS REVIEWS CHARGING INCENTIVES DEALERSHIPS CHECKLIST

 **Nissan Leaf**
Range: -----
Cost (with incentive): -----
REVIEWS
BOOK A TEST DRIVE

 **Chevrolet Volt**
Range: -----
Cost (with incentive): -----
REVIEWS
BOOK A TEST DRIVE

 **Kia Soul**
Range: -----
Cost (with incentive): -----
REVIEWS
BOOK A TEST DRIVE

MORE MODELS

Based on the responses to the simple five-point questionnaire for “pick your EV” (i.e., the “decision engine”) users are taken to the “Models” page where they are presented with **three potential EV models** (hence tackling choice overload).





These three models will be presented with minimal information – **range** and **cost** (with incentive included) with **reviews** (linked to Reviews) and option to **book a test drive** (linked to Dealerships).

More information can be obtained on each model on clicking further – see next slide.


Buyers also have the option of seeing the whole list of results and sorting through them, if they would like to explore further. This way, we ensure that we’re only highlighting the optimal choices and not limiting them.

6.2. Website Concept Design (contd.)

http://www.website.com

HOME MODELS **REVIEWS** CHARGING INCENTIVES DEALERSHIPS CHECKLIST    

#1: Nissan Leaf 2018



Range: 172km
Cost: ~~\$42,000~~
\$30,000 with Ontario EVIP rebate
Annual cost savings on gas: **\$1,540**
Specifications:

- _____
- _____
- _____
- _____



EXPERT REVIEWS [More...](#)

★★★★★
“The best wallet-friendly EV on Canadian the market today.”
- *Autocar Canada*

USER REVIEWS [More...](#)

“Excellent features and great price in one package.”
- *Sam Bobbage, Toronto*

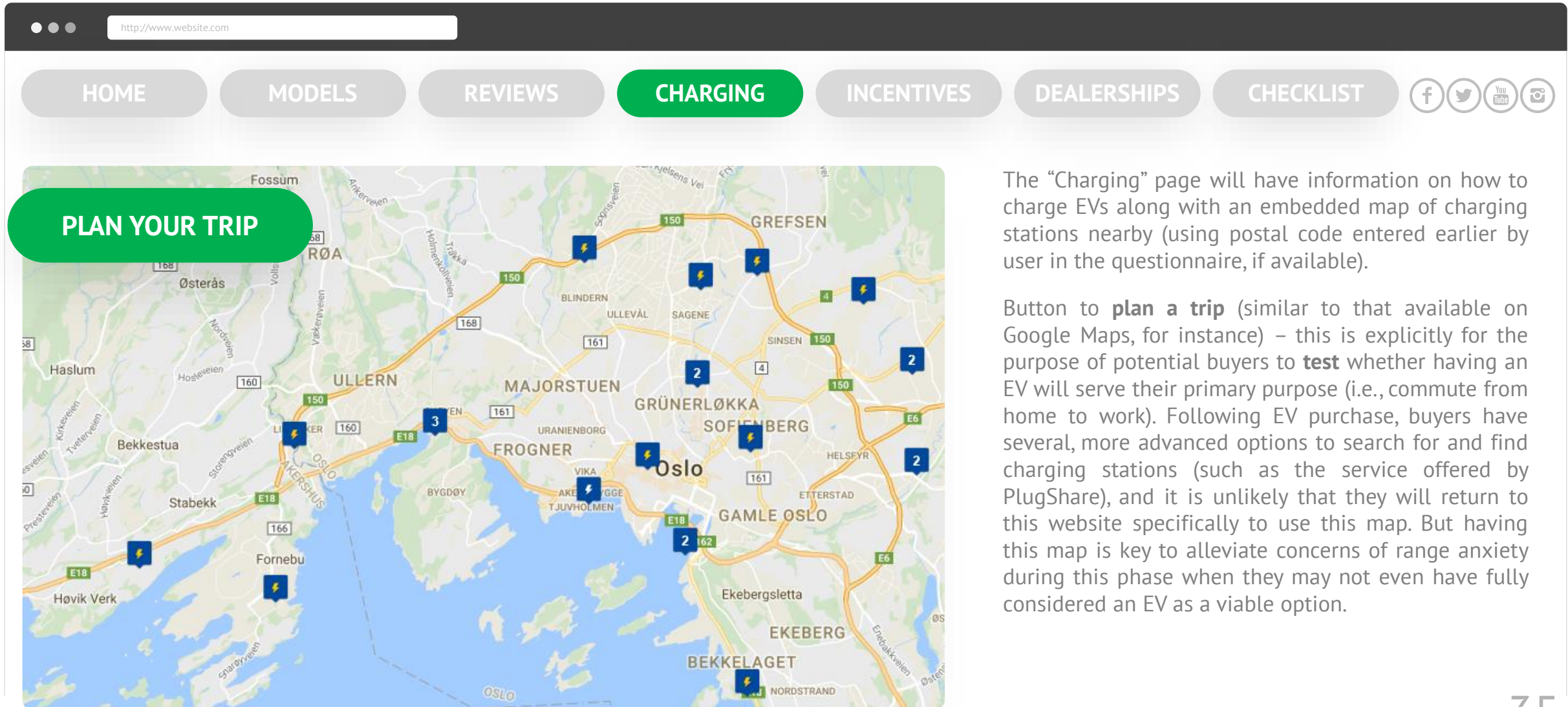
“The Leaf is the one EV to rule them all.”
- *Phillip Christansen, Ottawa*

 **Book a Test Drive** |  **Contact Us Today**

On clicking a particular model, users are taken to the “Reviews” page, where they can learn more about the model. But rather than overload them with data, they will be provided information pertaining to these five parameters only:

1. **Battery range** (to combat range anxiety)
2. **Cost** (with available incentives included)
3. **Annual cost savings on gas** (anchor used to make loss/savings salient)
4. **Top 2-3 reviews by experts and recent buyers** of same model - recent buyers can leave reviews, which could be further rated/validated by other buyers (similar to the “was this review useful” feature on Amazon). Expert reviews can be taken from trusted popular sources.
5. **Nearest dealerships** – to book a test-drive or for contact information

6.2. Website Concept Design (contd.)



The “Charging” page will have information on how to charge EVs along with an embedded map of charging stations nearby (using postal code entered earlier by user in the questionnaire, if available).

Button to **plan a trip** (similar to that available on Google Maps, for instance) – this is explicitly for the purpose of potential buyers to **test** whether having an EV will serve their primary purpose (i.e., commute from home to work). Following EV purchase, buyers have several, more advanced options to search for and find charging stations (such as the service offered by PlugShare), and it is unlikely that they will return to this website specifically to use this map. But having this map is key to alleviate concerns of range anxiety during this phase when they may not even have fully considered an EV as a viable option.

6.2. Website Concept Design (contd.)

http://www.website.com

HOME MODELS REVIEWS CHARGING **INCENTIVES** DEALERSHIPS CHECKLIST

f t YouTube i

Policy recommendations:

- 1. Simplifying complex eligibility requirements** is one way to make them easy for buyers to understand and make a decision about considering and/or buying an EV. For example, it might be better to have a flat EV rebate rate for a certain base EV model rather than having tiered incentives based on other characteristics like seating capacity.
- Financial incentives could be more powerful when combined with **“social contagion” or “word-of-mouth”** – that is, there could be an **option to reward “influencers” more**. For instance, a small portion of the currently available rebate (say \$1,000, out of a \$15,000 rebate) could be “locked” away and would be made available to recent buyers if one of their referrals became successful. The chain then repeats with the new buyer.

APPLY

Clicking on “Incentives” leads to a list of both monetary (like purchase rebates) as well as non-monetary EV benefits like HOV lane access, free charging stations, green number plates, etc. There will also be information on eligibility for these incentives based on specific criteria like EV models, battery capacity, seat quantity, etc.

After buyer has purchased an EV, the website must provide an option for him/her to apply for purchase rebates online. This could be in the form of a drop-down menu button called “Apply” under “Incentives.” When buyers click on this button, they would be taken to a page hosting an application form (and additional documents, if any). There should be both an online form (that can be submitted online) and a downloadable PDF file (which can be filled and mailed out or submitted elsewhere).

6.2. Website Concept Design (contd.)

The screenshot shows a website interface with a navigation bar containing buttons for HOME, MODELS, REVIEWS, CHARGING, INCENTIVES, DEALERSHIPS (highlighted), and CHECKLIST. Social media icons for Facebook, Twitter, YouTube, and Instagram are also present. The main content area is divided into two sections. The left section, titled 'Best dealerships in your area:', lists three dealerships: Forest Hill Nissan Dealership (5 stars, 5 km away), Yorkville Toyota (4 stars), and Markham BMW (3 stars). A 'See in maps' button is at the bottom. The right section, titled 'Policy recommendations:', contains an introductory paragraph and three numbered points: 1. Better educate salespersons on incentives and charging infrastructure; 2. Incentivize salespersons to provide pre-filled incentive forms; 3. Collect user reviews for ranking dealerships.

http://www.website.com

HOME MODELS REVIEWS CHARGING INCENTIVES **DEALERSHIPS** CHECKLIST

Best dealerships in your area:

Forest Hill Nissan Dealership
★★★★★
5 km away

Yorkville Toyota
★★★★

Markham BMW
★★★

See in maps

Clicking on “Dealerships” leads users to a list of dealerships selling EVs nearby sorted by proximity (using postal code entered earlier by user in the questionnaire, if available). In case the user had not filled the questionnaire, there will be an option to input a postal code and find out nearest dealerships with buyer reviews. Top-performing dealerships (in terms of sales, and buyer reviews) could be showcased here using a ranking system.

Policy recommendations:

Dealerships are a very critical touchpoint in the EV buyer journey, and hence are important channels in any EV marketing strategy.

1. There must be opportunities to **better educate salespersons** of currently available government purchasing incentives (both monetary and non-monetary) and availability of charging infrastructure.
2. Another key recommendation is to **incentivize salespersons** to provide pre-filled or partially filled incentive application forms for new EV buyers to complete alongside regular paperwork associated with the purchase. There could also further be an option for the dealerships to apply for the incentives on behalf of the buyer.
3. **User reviews** could be collected on the website and used for ranking the best dealerships.

6.2. Website Concept Design (contd.)

The image shows a browser window with the URL `http://www.website.com`. The navigation menu includes: HOME, MODELS, REVIEWS, CHARGING, INCENTIVES, DEALERSHIPS, and CHECKLIST (highlighted in purple). Social media icons for Facebook, Twitter, YouTube, and Instagram are on the right.

#1 Apply for incentives

- Have Driver's License
- Evaluate **EV models** Link to "Models" with top 3 options
- Choose model

#2 Purchase EV

- Visit **dealership** Link to "Dealerships" with map showing closest dealerships
- Test drive chosen EV
- Purchase EV

#3 Financial Incentives

- Confirm **eligibility** Link to "Incentives" with eligibility details
- Estimate incentive:
 -
 - +
 -
 - +
 -
 - =
 - Total \$ _____

This page hosts a checklist of "to-do" style steps that potential EV buyers need to go through before/after purchasing an EV (both web-based and downloadable PDF option). Some obvious items like "have a driver's license" can be already checked off to give perception of progress.

#4 Apply for incentives

- Talk to your dealership
- OR
- Apply online** Link to "Apply" with online application form

6.3. Road Signage & Charging Stations

Having a **uniform design for EV-related road signage** is important for current and potential EV buyers to increase awareness about infrastructure options available to them (dedicated parking, public charging stations, access to HOV lanes, etc.). Having a **universal symbol for EVs** is also helpful to improve recall and normalize EVs with potential buyers.

Policy recommendation: preparing a set of design/branding guidelines for charging stations (both public and privately owned/operated) could be effective in improving the public perception and recall for EVs. This could include making it mandatory for charging stations to use the universal EV symbol. There is precedence for recognition of simple symbol recognition in healthcare.²⁷



7. Experimenting

While our study revealed several elements of behaviourally informed design that could help improve the adoption of EVs, it is important to understand that behavioural science is very much an evidence-based practice. It is crucial to test our proposed behavioural interventions rigorously through randomized controlled trials (RCTs) i.e., a study or set of experiments in which users are randomly allocated (or “treated”) to one or more “treatments”. RCTs must also include a “control group” – i.e., users that did not receive the treatment(s) being tested.

Our proposed interventions offer excellent opportunities for testing and evaluation: While our study revealed several elements of behaviourally informed design that could help improve the adoption of EVs, it is important to understand that behavioural science is very much an evidence-based practice. It is crucial to test our proposed behavioural interventions rigorously through RCTs.

Our proposed interventions offer excellent opportunities for testing and evaluation:

- The website itself could be the stage for various A/B testing options – the landing page could be tested with different versions of the graphic to determine which one results in users clicking on “Pick your EV” the quickest. The graphic is an excellent way to use “loss framing” to influence buyer decision-making.
- Another section of the website that offers testing opportunities is reviews (of both EV models and dealerships by buyers) – different versions of these reviews could be tested to see which were effective in making users click on “book a test ride” or so on.
- An offline channel that we feel could use extensive testing is the dealership – while these are complex channels to test behavioural interventions on, we understand that it is a very critical bottleneck in the EV buyer journey at the moment, due to the ambiguity bias that exists with both buyers and salespersons. Hence it is crucial to experiment with dealerships with different kinds of EV-related messaging and buyer interaction interfaces.



8.

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