



EVOLUTION OF MOBILITY: THE PATH TO ELECTRIC VEHICLE ADOPTION

AUGUST 2019

Cox
AUTOMOTIVE™

About the EV Study

Consumers

Online survey among a mix of EV owners,
EV considerers, and EV non-considerers
2,503 Consumers – Fielded

Dealers

Online survey among single or
group Franchise dealers
308 Dealers

Fielded January – March 2019

COX AUTOMOTIVE™

Research Objectives

1

Explore the gap between consumers and dealers' barriers and expectations with current EV realities in the US

2

Understand EV shoppers' dealership experiences during their purchase journey

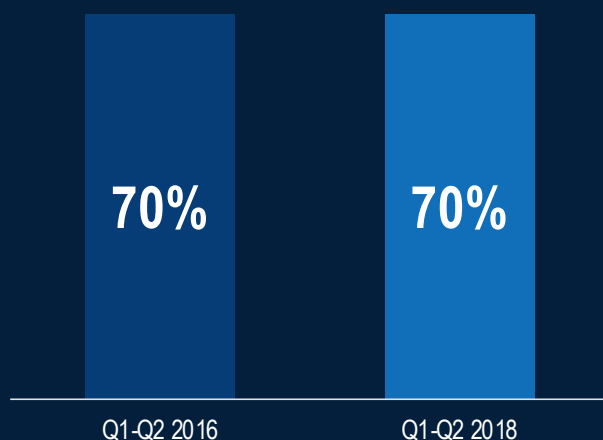
3

Examine key support areas dealers need to advance EV adoption

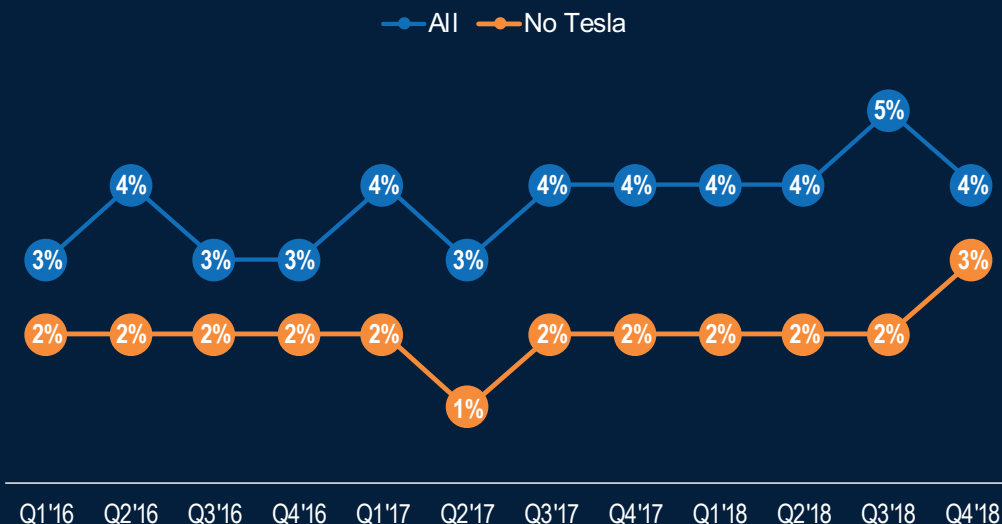
Consumers Believe EVs are Coming, But that Hasn't Increased Their Interest in Buying One

EV as the Vehicle Trend in the Next Five Years

(% More on the Road)



Electrical Vehicle Consideration

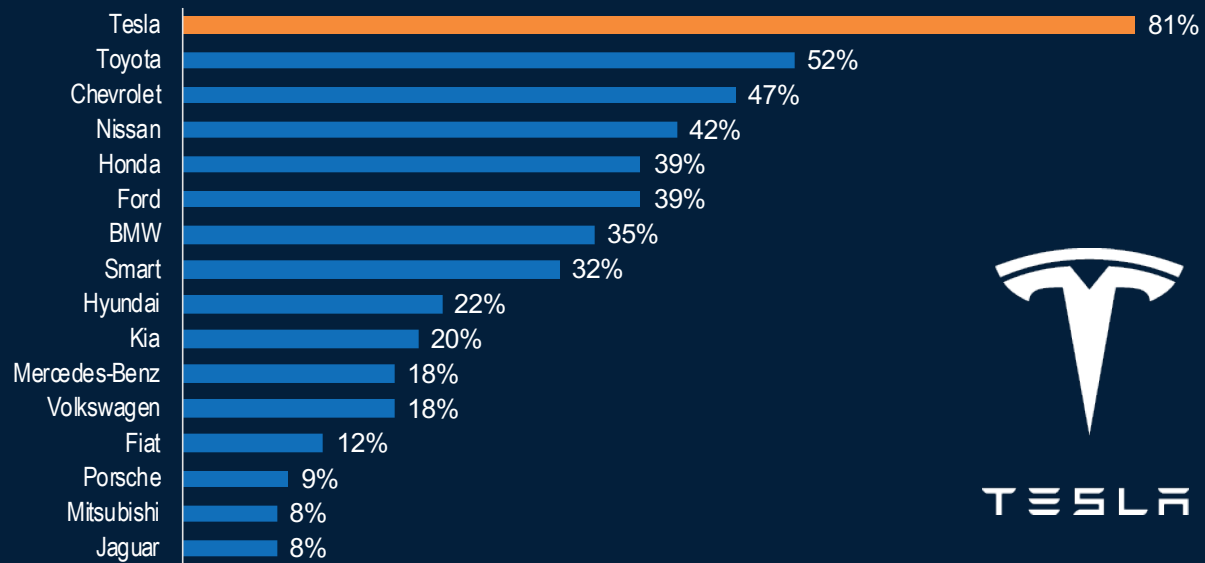


Q. Where do you think the trend is going for the following type of vehicles in the next 5 years?

Tesla Leads the Pack in EV Brand Awareness

EV Brand Awareness (Aided)

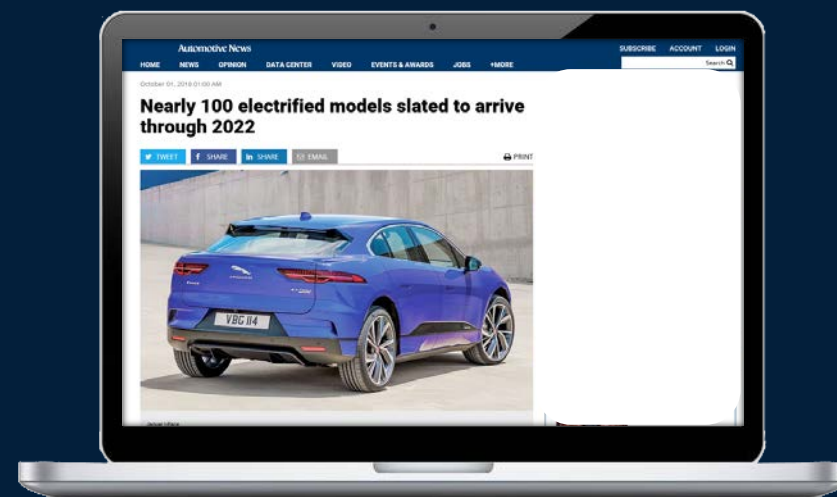
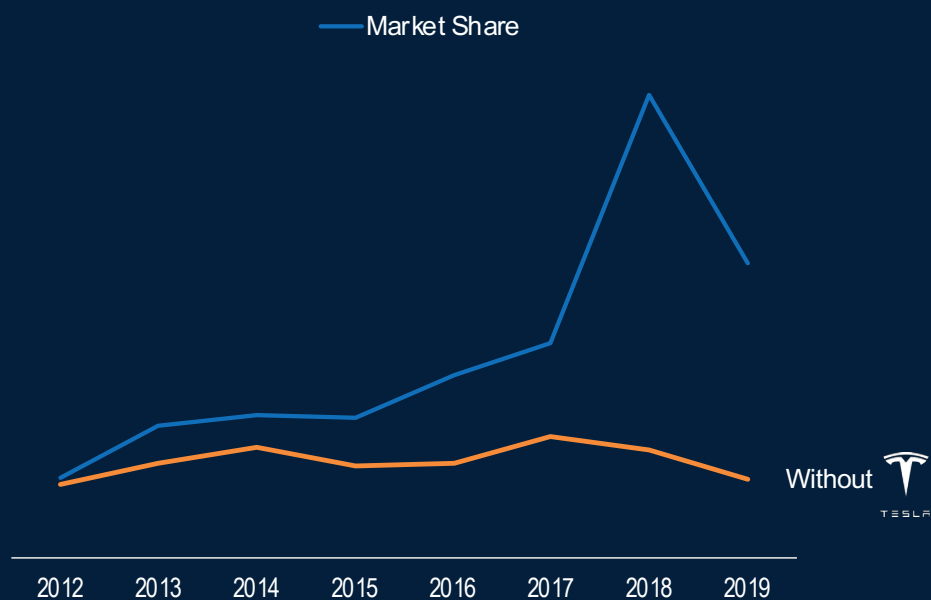
Considerers^
(n=1,001)



Q55. What brands of all-electric vehicles are you aware of?
Q56. Which of the following brands make an all-electric vehicle?

Without Tesla, EV Market Share is Stagnant, Yet Almost 100 Electrified Models are Coming Soon

EV Trended Market Share



A photograph of a young man and woman smiling and looking at a map together. The woman is in the foreground, pointing at the map, while the man stands behind her with his arm around her shoulder. They are outdoors, and the scene is bathed in warm, golden light, suggesting a sunset or sunrise. The image is partially covered by a dark blue geometric overlay on the left side.

CLEAN UP MISCONCEPTIONS ON THE COST AND RANGE

There Are Very Clear Barriers to Adoption Among Non-Considerers



70%
Cost

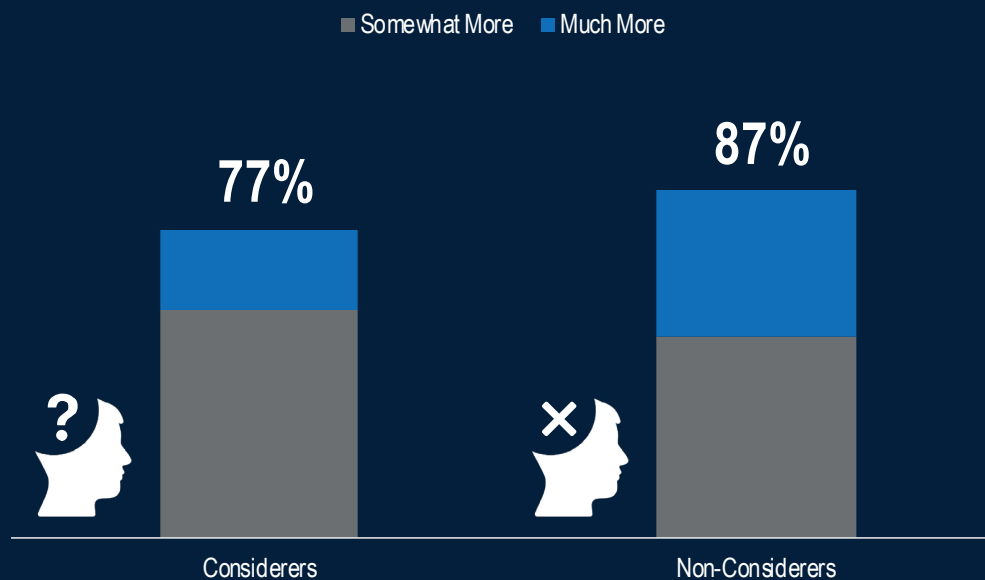


83%
Charging/Battery



Perceived Initial Cost is Higher than ICE Vehicles

EVs Cost MORE than Gas-Powered Vehicles

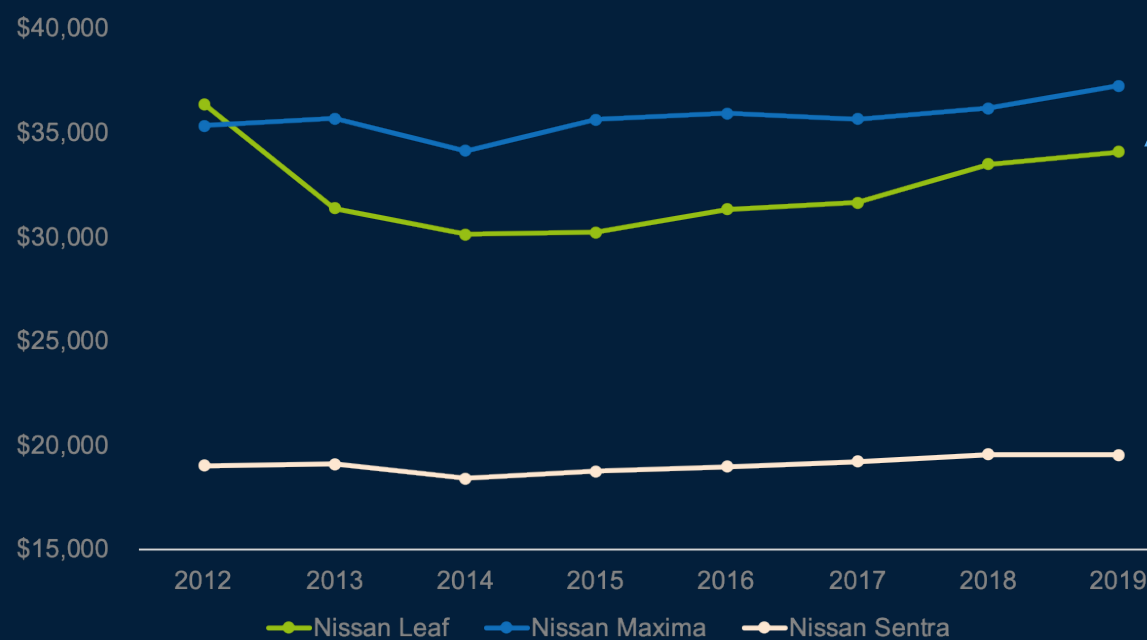


Q38. Do you think that the price for an all-electric vehicle on average is about the same, less or more than the price for a gas-powered vehicle?

Affordability Is Within Reach as the Price Gap Closes

Example

Average Transaction Prices Nissan



ATP Change

(2012 vs. 2019)

Nissan Leaf: -2.5%

Nissan Maxima: 7.5%

Nissan Sentra: 3.1%

Majority Perceive Cost of Ownership to Be Less for EVs



98%

Considerers

**Take Ownership Cost Into
Account When Initially
Considering the Cost of an EV**



65%

Considerers

**Think It Costs Less to
Charge an EV than Fuel a
Gas Vehicle**



54%

Considerers

**Think It Costs Less to
Maintain an EV than a Gas
Vehicle**

- Q39. Considering the cost of charging an all-electric vehicle versus the cost of gas for a gas-powered vehicle, do you think the cost of driving an all-electric vehicle is about the same, more, or less than the cost of driving a gas-powered vehicle?
Q14. What are your expectations about the costs of service and maintenance for an all-electric vehicle versus a gas-powered vehicle?
Q40. [Did/Will] you take the cost of driving an all-electric vehicle versus a gas-powered vehicle over time into account when considering the initial cost of purchasing/leasing an all-electric vehicle?

In Actuality, 5-Year Cost-to-Operate Savings is Positive for EV Consumers

Average 5-Year Total
Cost-to-Operate Savings

58%

EV vs. ICE



Average Fuel
Savings

60%



Average Service
Cost Savings

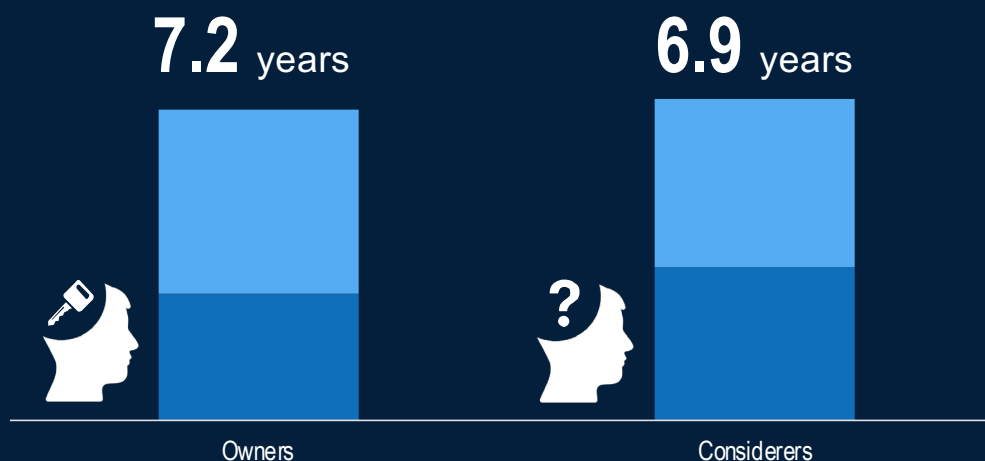
25%

*5-Year Cost to Operate includes Expenses such as Fuel, Insurance, Financing, State Fees (License, Registration, State Sales Tax, and Federal Tax Credits), Maintenance, and Repairs. Average includes calculations of EVs and their comparable ICE vehicles. Depreciation is excluded from Cost to Operate calculations. Vehicles in the analyses are: Kia Soul EV vs. Kia Soul ICE, Chevy Bolt vs. Chevy Sonic, Nissan Leaf vs. Nissan Sentra, Hyundai Ioniq EV vs. Hyundai Elantra GT, and Kia Niro EV vs. Kia Sportage.

The Cost Associated with Battery Replacement May Cause Concerns Around EV Battery Lifespan

Consumer Expected EV Battery Life

AVERAGE ■ 5 years/65k miles or less ■ 8 years/100k miles+



Q53. How long do you perceive that a typical all-electric vehicle battery lasts before it must be replaced?

Warranty Programs and Declining Battery Pack Pricing Provide Assurance Over Battery Replacement Cost Concerns



Federal regulations mandate OEMs offer a minimum of 8-Year/100K miles warranty on batteries

Lifetime coverage on batteries is offered on the Hyundai Kona

Average Battery Pack Price Decrease

77%↓

from 2010-2016

45%↓

additional decrease
by 2021

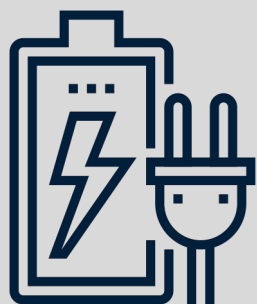
Q31. What are the main reasons you are not considering purchasing/leasing an all-electric vehicle?
Q33. What reasons, if any, might prevent you from purchasing/leasing another all-electric vehicle in the future?

COX AUTOMOTIVE™

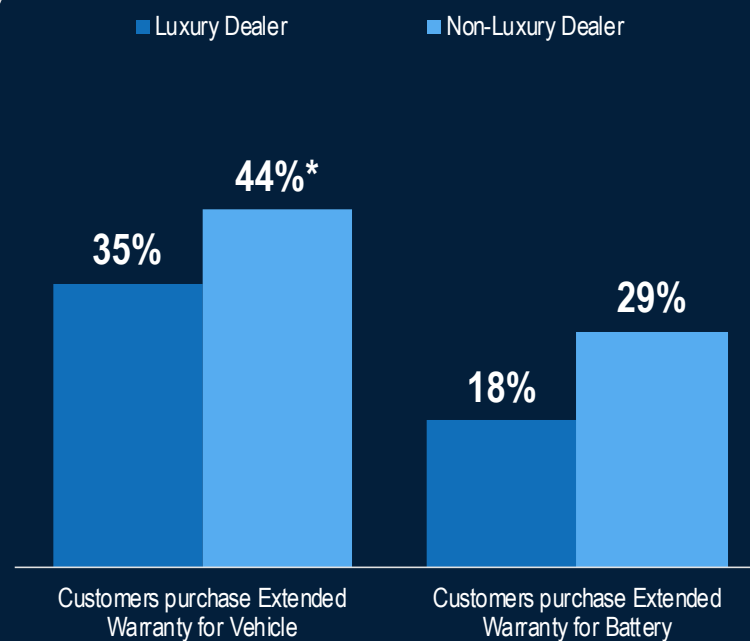
Source: 2019 Cox Automotive EV Study

Source: IHS Bloomberg; www.myev.com "Evaluating Electric Vehicle Warranties", Jan 15, 2019;
www.forbes.com "4 US EV Trends to Watch in 2019", Jan 2, 2019

More Than Half of Owners Bought Extended Warranty for Their EV Batteries



52%
of EV Owners
Purchased
Extended Warranty
for Battery



Q15. Did the dealership or showroom staff discuss any of the following with you regarding an electric vehicle?

Q16. Did you purchase any of the following for your electric vehicle?

* Statistically significant difference at 95% level

Considerers Desire Mileage Range Comparable to ICE

Battery Range Among Considerers



Min Acceptable

184
miles

Estimated

240
miles

Desired

300
miles

Range for ICE: **300-400** miles

Q45. How often do each of the following problems/issues happen with your all-electric vehicle?
Q35. What is the approximate number of miles you estimate an all-electric vehicle can be driven before the battery is fully depleted and needs to be charged?
What is the minimum acceptable number of miles you could drive between battery charges for an all-electric vehicle? And, what is your desired number of miles you could reasonably drive between battery charges for an all-electric vehicle?

Range is Becoming Less of a Concern

2019			2020			2021			2022		
		Mileage Range			Mileage Range			Mileage Range			Mileage Range
	Audi e-tron	204		BMW iX3	250		BMW i4	300		Tesla Pickup	500
	Hyundai Kona EV	258		Byton M Byte	323		BMW iNEXT	310			
	Kia Niro EV	239		Mercedes-Benz EQA	250		Genesis Electric Sedan	310			
	Kia Soul EV	111		Rivian R1T	400						
	Mercedes Benz EQC	310		Tesla Roadster	600						
	Mini Electric	200		Polestar 3	275						
	Nissan Leaf (extended range)	225		Volvo XC40	250						
	Polestar 1	93									
	Polestar 2	350									
	Porsche Taycan	300+									
	Tesla Model 3	264									
	Tesla Model Y	280									

RANGE IS FINE....
INFRASTRUCTURE
IS PRIORITY

GO GREEN WITH MANHEIM'S ELECTRIC VEHICLE
**CHARGING
STATION**



JOIN US IN DRIVING SUSTAINABILITY



NovaCHARGE
Powering the Future
NovaCharge.net

There Is a Clear Need for More Charging Stations

Too Few Charging Stations



Q50. What is your perception of the number of electric vehicle charging stations around the area where you live? Around the area you work?

Implementing Future Battery Charging Services Can Enhance the Current Infrastructure

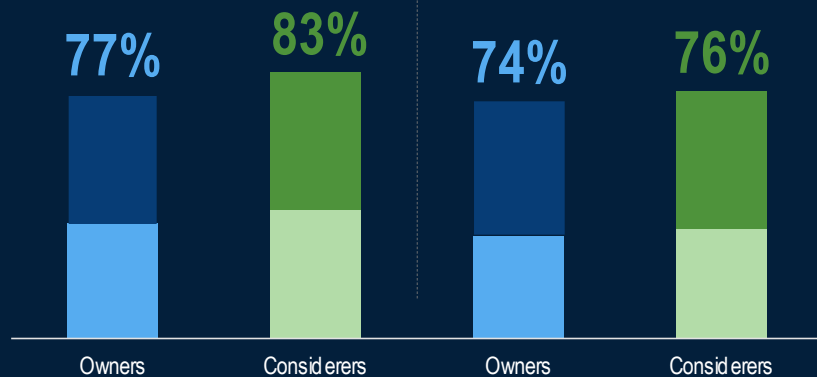
Interest in Future Battery Charging Services

Mobile battery charging service that comes to your location

Robotic charging station where a robot locates your vehicle, plugs it in and charges it (No human interaction)

Extremely Interested

Somewhat Interested



Q52a. How interested would you be in using each of the following services for your electric vehicle?

* Statistically significant difference at 95% level

Source: 2019 Cox Automotive EV Study

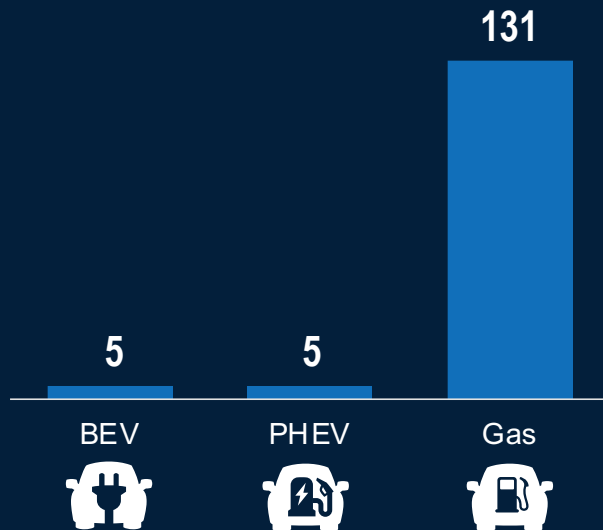
COX AUTOMOTIVE™



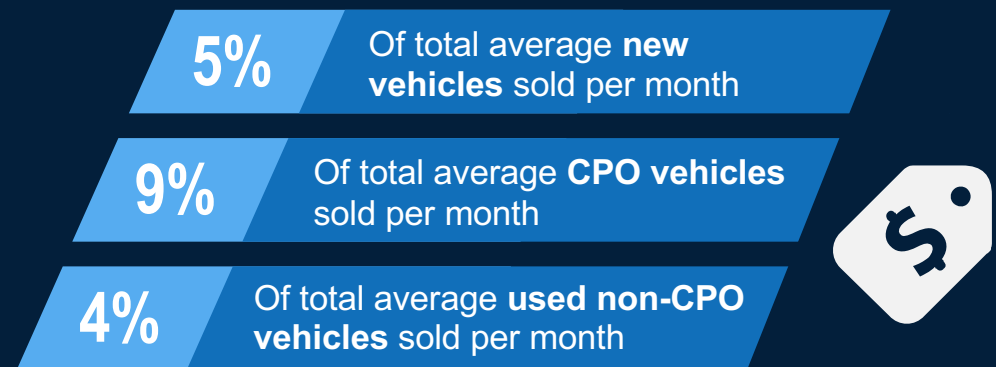
DEALERS HAVE MANY
BARRIERS TO OVERCOME

Dealers Aren't Really Selling Many EVs Today...

Average Number of Vehicles Sold per Month



Dealers Say EVs Represent Only...



...And In Reality It's Even Lower

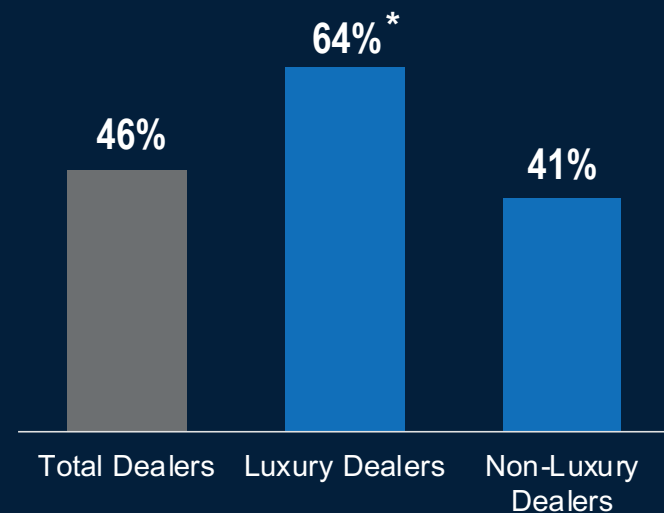
Q1. Calculated: Q1 monthly sales BEV/PHEV by type divided by Total Q1 monthly sales for all vehicles by type
During an average month, how many of each type of vehicle does your dealership sell to consumers in each of the following sales categories?

...And Dealers Aren't Convinced that Will Change

Only
9% of dealers feel their OEM is exerting high pressure to hit EV sales targets



Expect EV Sales to Increase in the Next 1-2 Years

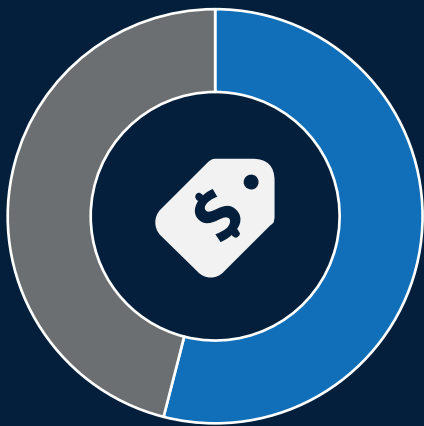


Q14. What level of pressure, if any, is your EV OEM imposing on your dealership regarding hitting sales targets of electric vehicles?
Q5a. How do you expect sales of the following types of electric vehicles to trend in the next 12-24 months? - Battery electric vehicles (BEV)
Q5b. How do you expect sales of the following types of electric vehicles to trend in the next 12-24 months? - Plug-in hybrid electric vehicles (PHEV)

Dealers' Lack of Urgency Can Be Attributed, in Part, to the Perception of Lower Profits for EVs

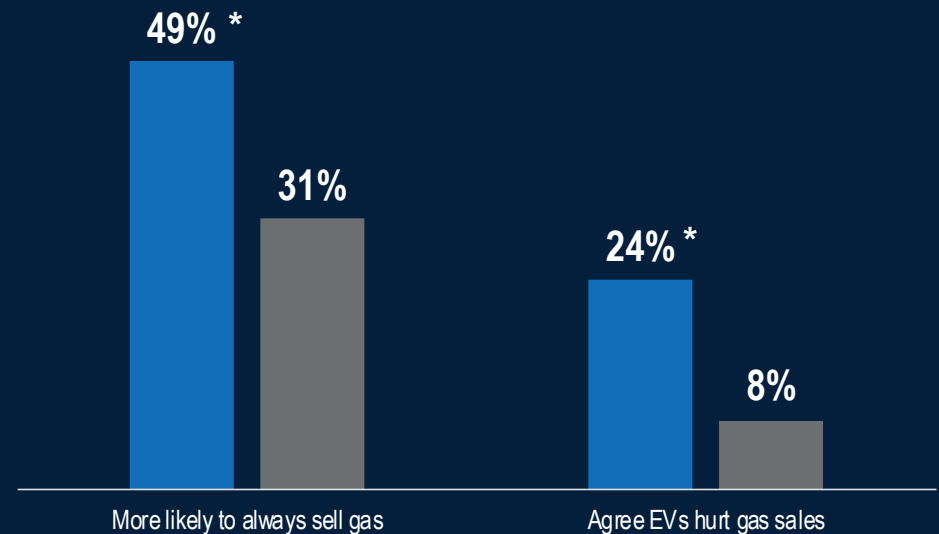
Dealer Perception of EV Service & Sales

■ See Lower ROI from EV Sales ■ Do Not See Lower ROI from EV Sales



54%

See lower **ROI** for sales of **EVs** compared to gas



Q31. Compared to gas vehicles, does your dealership...?
Q32. In which of the following ways is servicing electric vehicles different than servicing gas vehicles
Dealers with Service Department

Dealers Encounter Similar Barriers as Consumers

Barriers to EV Purchase



Dealers

79%

79%



Cost



Charging/Battery



Consumers

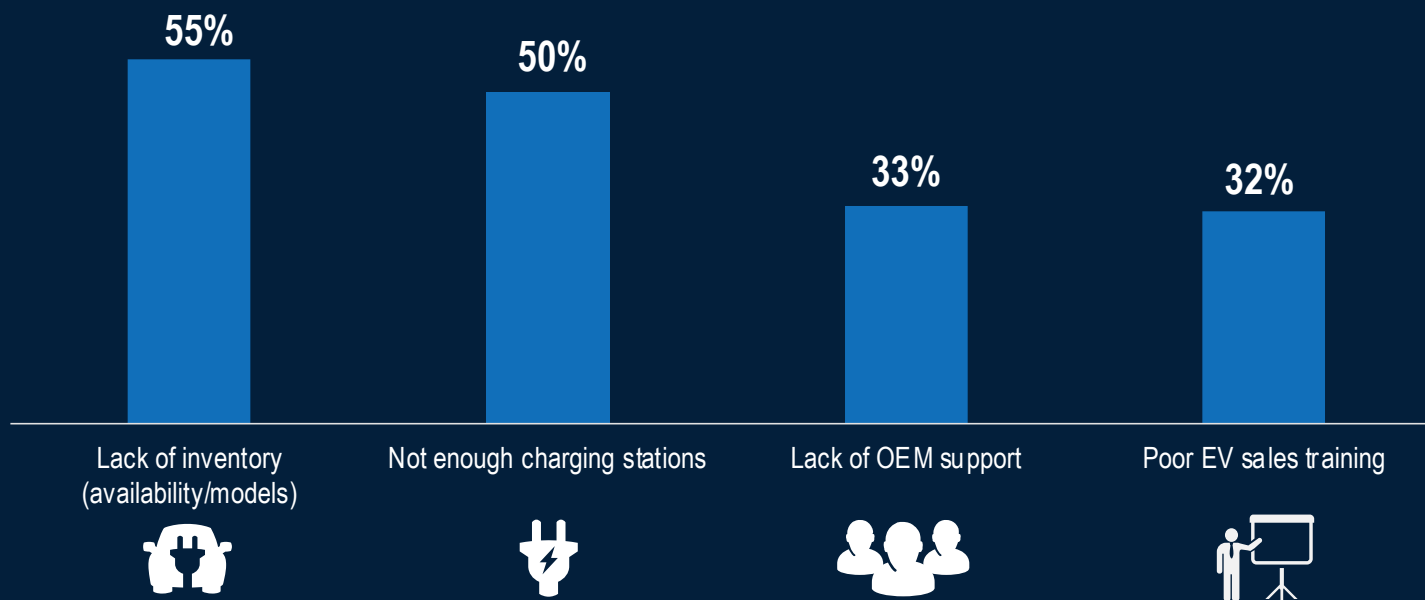
70%

83%

Q7-a and Q7.1-a Which of the following do you believe are customer barriers to purchase or lease of electric vehicles? / What is the most important or main barrier?
Q31 What are the main reasons you are not considering purchasing/leasing an all-electric vehicle? / What is the most important reason you are not considering purchasing/leasing an electric vehicle?

EVs Are Just More Complicated to Sell with Additional Internal Barriers

Top Internal Sales Barriers for Dealers



Q10.1 What are the key internal barriers that prevent your dealership from selling more electric vehicles (BEVs/PHEVs)?

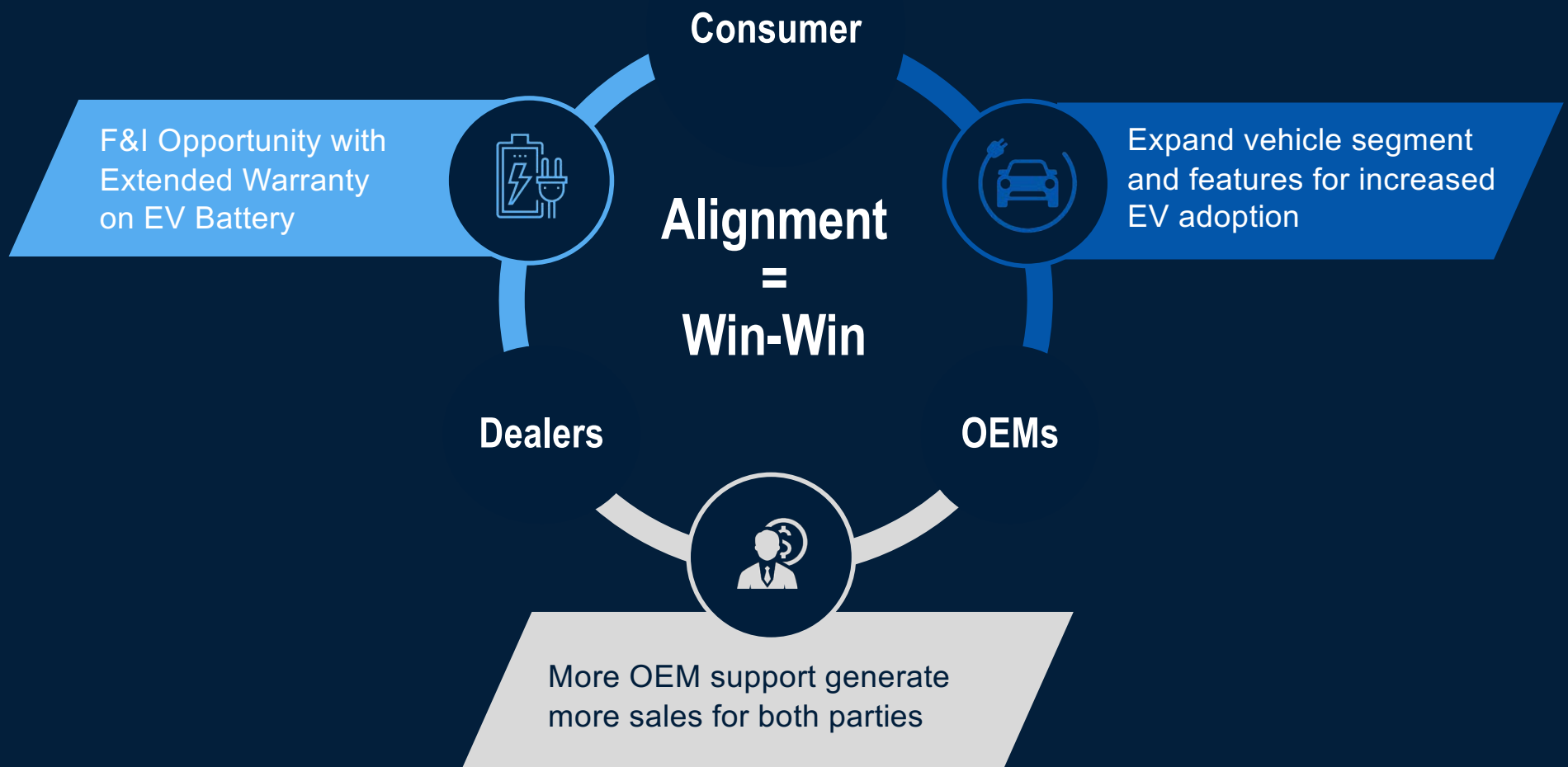



COX AUTOMOTIVE™



Source: 2019 Cox Automotive EV Study

THE RIGHT
ALIGNMENT IS KEY

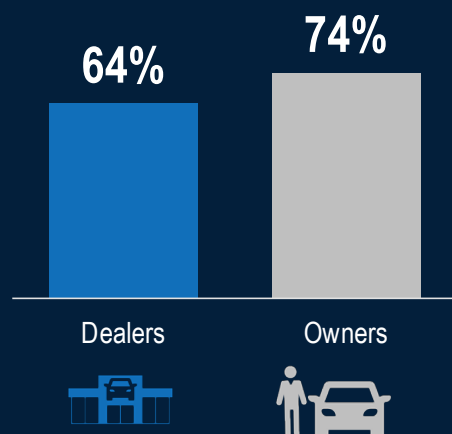




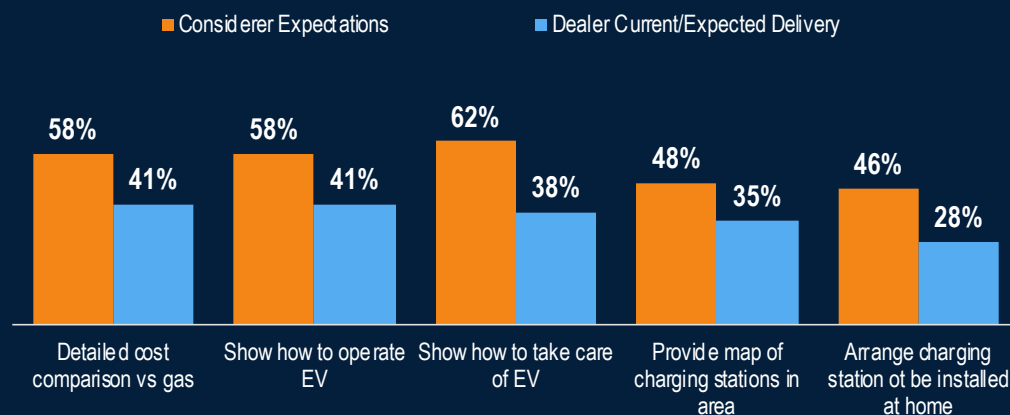
MORE OEM
SUPPORT GENERATES
MORE EV SALES FOR
DEALERS AND OEM

Dealers Are Underestimating Their Influence. OEMs Can Help Fill the Influence Gap.

Dealer/Salesperson has Strong Influence on EV Purchase Decision



EV Considerer Expectations vs. Dealer Delivery



Q21. How much influence do you think the dealership experience has on your customers' final decision to purchase/lease an electric vehicle?

Q6 Consumer. How much influence did the dealer/showroom have on your final decision to purchasing/leasing an all-electric vehicle?

Q9 Consumer. What expectations [do/did] you have of the dealership/showroom and staff when you shopped for an electric vehicle?

...But Dealers Aren't Experiencing Enough OEM Support

66% of Dealers Are Receiving
Some to No OEM Sales
and Marketing Support

Among dealers receiving any support,
only 32% consider it very **helpful**

- Q14. What level of pressure, if any, is your EV OEM imposing on your dealership regarding hitting sales targets of electric vehicles?
- Q15. What level of marketing and sales support (e.g., programs, promotions, incentives) is your EV OEM providing to help you sell/lease more electric vehicles?
- Q17. How helpful is the marketing and sales support provided by your OEM in selling more electric vehicles? / Base Dealers receiving any OEM support



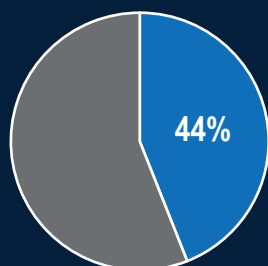
COX AUTOMOTIVE™



Source: 2019 Cox Automotive EV Study

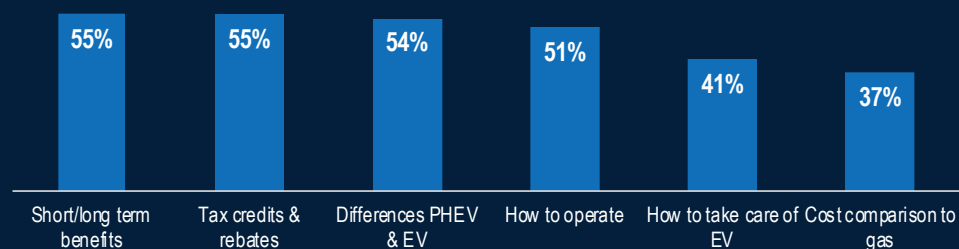
Even Among Dealers Who Feel **Well-Prepared** for Future EV Demand, Most Are in Need of OEM Support in Several Areas

Are Extremely/Very Prepared

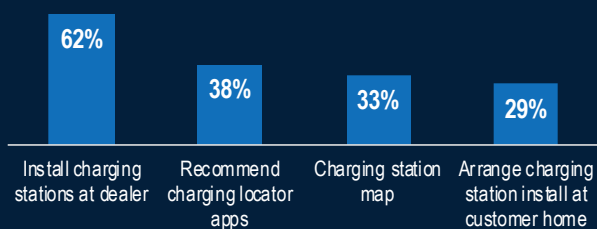


Among those dealers...

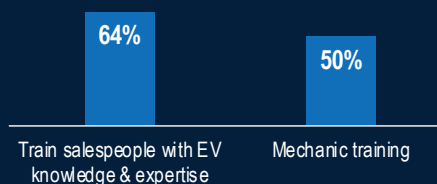
Consumer Education Offered



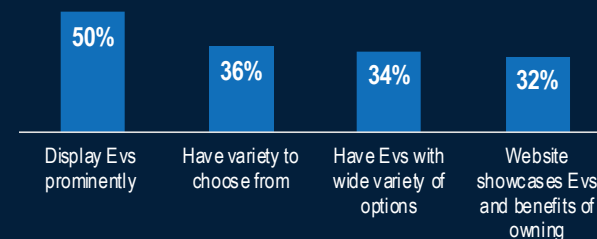
Charging Support Offered



Training Offered



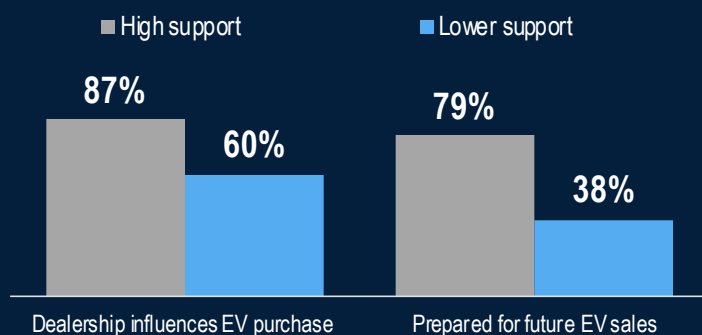
Marketing & Variety Offered



Q8. With that in mind, how prepared do you think your dealership is if there is a future increase in sales of electric vehicles?
Q9. What methods is your dealership currently implementing to prepare for the increase in sales of electric vehicles?

There's Payoff with the Right Alignment... Dealers Receiving Quality OEM Support Enjoy Higher EV Sales

High Support Dealers Sell
88% More EVs than Lower Support



- Q21. How much influence do you think the dealership experience has on your customers' final decision to purchase/lease an electric vehicle?
- Q8. With that in mind, how prepared do you think your dealership is if there is a future increase in sales of electric vehicles?
- Q1. During an average month, how many of each type of vehicle does your dealership sell to consumers in each of the following sales categories?
- Q2a/b. How, if at all, did [new/used] vehicle sales change in 2018 versus 2017, for each of the following vehicle types?

COX AUTOMOTIVE™

Source: 2019 Cox Automotive EV Study

Key Takeaways

1

Cost & Battery remain the biggest consumer and dealer barriers to EV adoption.

2

Public charging infrastructure is critical to further EV proliferation.

3

Dealers do not feel a sense of urgency to sell EV due to lack of inventory levels, perceived profits, and OEM support.

4

Dealers need more education, marketing and sales support from automakers to ensure preparedness to sell and service EVs.





APPENDIX

Methodology: Consumer Survey

An online survey was conducted via a representative online panel from January 16 – February 4, 2019.

US Representative General Population Sample

Age 18-72 & not employed in sensitive industries
Vehicle decision maker

EV Owners

(n=502)

- Own/drive a Battery Electric Vehicle (BEV)
- Purchased/leased BEV from dealer or website
- Visited a dealer showroom as part of BEV research

EV Considerers

(n=1,001)

- Aware of BEVs but do not own/drive
- Plan to purchase/lease vehicle in the N12M
- Would consider a BEV in the N2Y
- Would consider purchasing from a dealer or online

EV Non-considerers

(n=1,000)

- Do not own/drive BEV
- Plan to purchase/lease vehicle in the N12M
- Would NOT consider a BEV in the N2Y
- Would consider purchasing from a dealer or online

Oversampling was conducted to increase the overall base sizes of these groups to:

n=103 Generation Z (age 18-22)

n=305 Luxury Automobile Owners
n=105 Generation Z (age 18-22)

n=305 Luxury Automobile Owners
n=105 Generation Z (age 18-22)

Methodology: Dealer Survey

An online survey was conducted using a qualified Cox Automotive list from March 8 - March 18, 2019. Cox Automotive was identified as the sponsor of the research.

308 US Dealers

- Single or group Franchise dealership
- Sell 5+ new and/or used vehicles a month
- Sell new or used BEVs or PHEVs
- Involved in vehicle sales operations decisions or strategy and business operations decisions

