

Future Autonomous Vehicle Driver Study September 2016





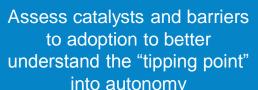
Autonomous Vehicles are capturing the attention of the industry, consumers, dealers, automakers and developers alike. The industry is thirsty for guidance and inspiration in a time of dynamic change, uncertainty and excitement. As an expert in Autonomous Vehicles, we wanted to gather consumer feedback to ignite new conversations around Autonomous Vehicles and the changes that will impact transportation and vehicles forever.

Identify current consumer perceptions and misperceptions of Autonomous Vehicles overall and by each level of autonomy

Size the current marketplace in terms of appeal and overall perceptions towards **Autonomous Vehicles**

Reveal the occasions and situations in which people would use autonomous vehicles

to adoption to better understand the "tipping point" into autonomy





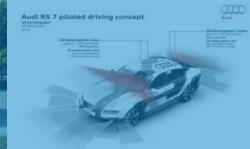












Methodology

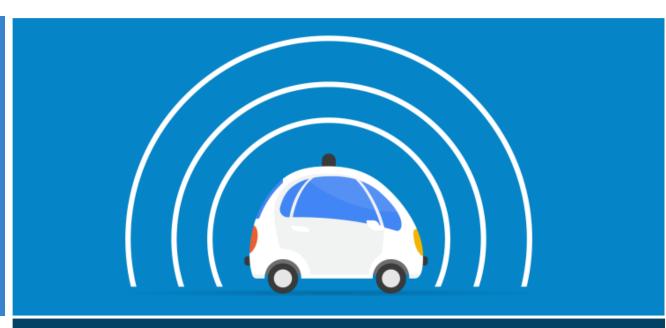
National online survey of U.S. residents 12-64 years old

n= **2,264**

Conducted from May 20-27, 2016 The sample was weighted to Census figures by age, gender, ethnicity and region.

In order to quickly educate our respondents and bring them up to speed with the levels of autonomy, we showed them a short animation that touched on features that differentiate each level from the next.

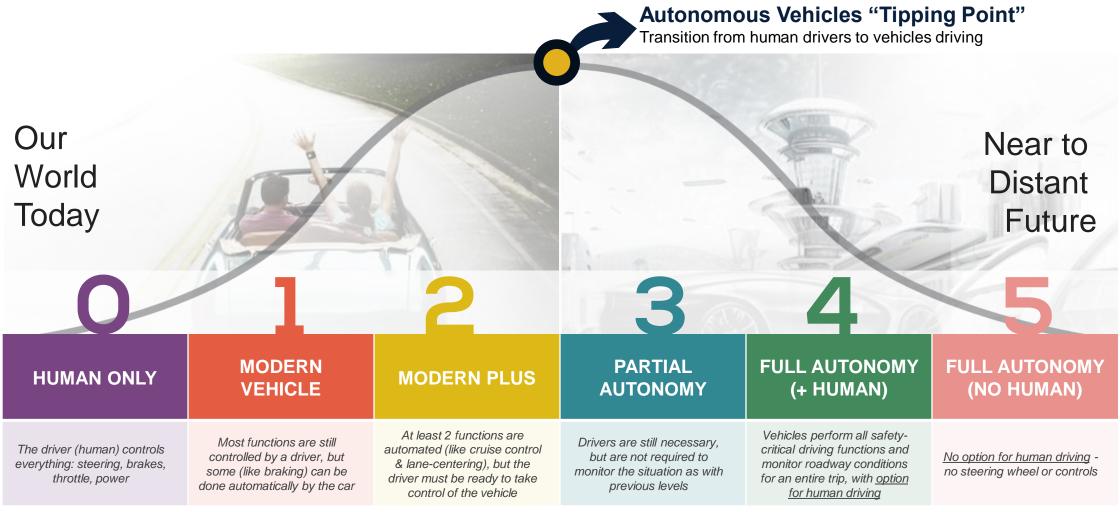






THE VEHICLE HAS NO AUTONOMOUS FEATURES

> The levels of Autonomous Vehicles

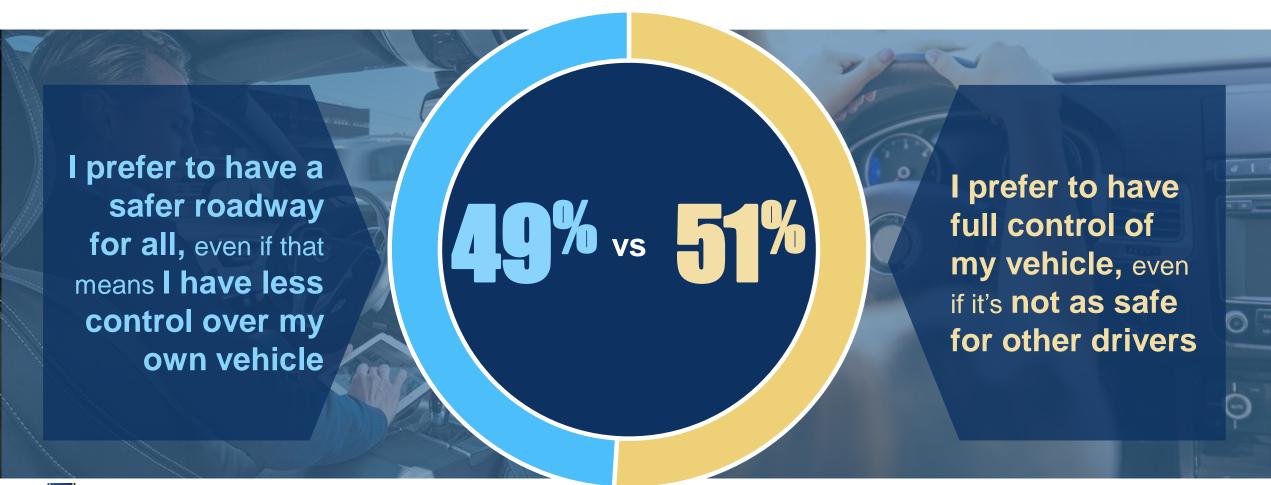






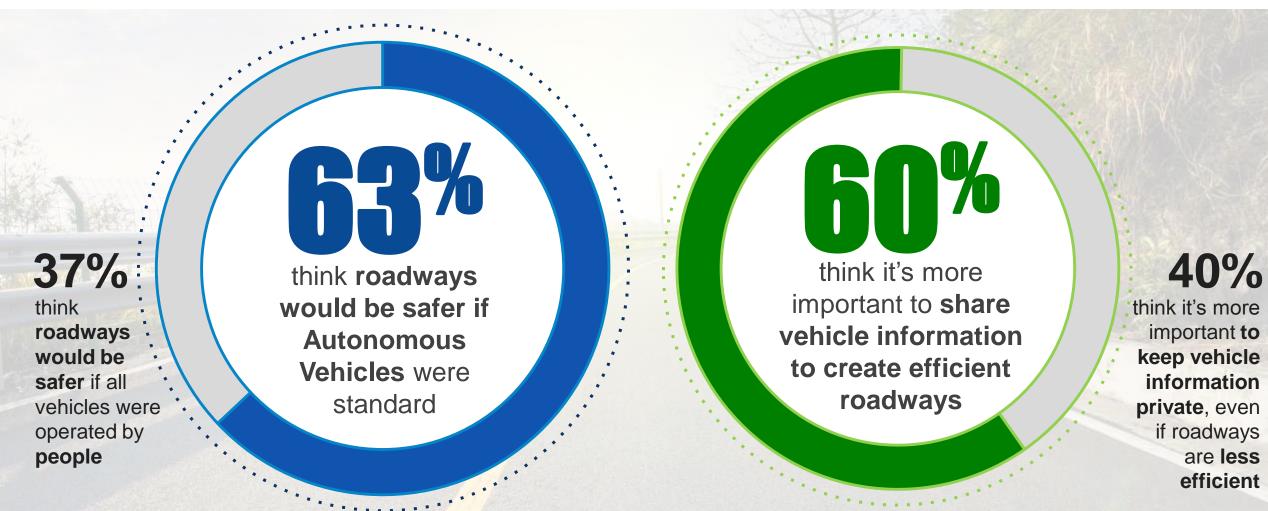


Consumers are torn between the need for safety and the desire for control





A majority of Americans see a world with fully Autonomous Vehicles as safer and more efficient... but there are detractors as well



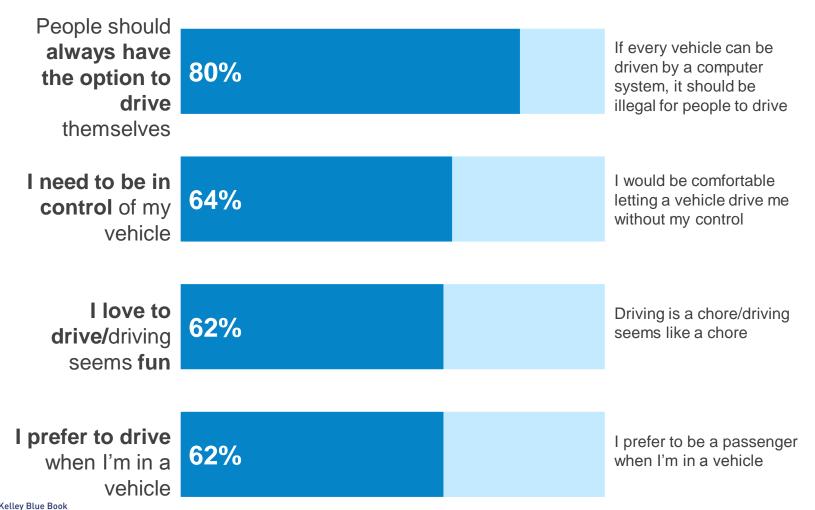


Base: Total (n=2264)

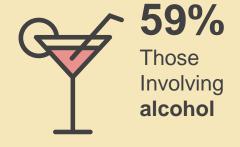
ATT1. Below are some statements that people have used to describe their feelings towards Autonomous Vehicles and driving in general. For each pair of statements, please indicate which statement you agree with more.

ATT1A. Below are two statements that people have used to describe their feelings towards this potential future, please indicate which statement you

However, today Americans still crave being in the driver's seat, as driving is far from being considered a chore



Occasions best fitted for Level 5 Full Autonomy (No Human) are limited to:







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ATT1. Below are some statements that people have used to describe their feelings towards Autonomous Vehicles and driving in general. For each pair of statements, please indicate which statement you agree with more.

AV9. For each occasion, please select the level(s) of autonomy that you think is the best fit.

> As such, Americans aren't quite ready for Level 5 Full Autonomy (No Human)











> Americans are more familiar with the term "Self-Driving Vehicles" than "Autonomous Vehicles"

Self-driving Vehicles

79%

Driverless Vehicles

70%

Autonomous Vehicles

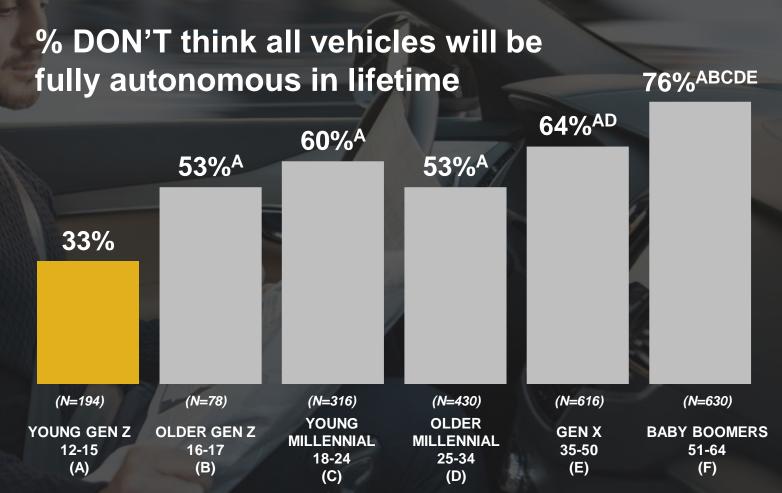
41%



Most consumers do <u>not</u> think they will live to see a world where all vehicles are fully autonomous; this sentiment is strongest among older consumers

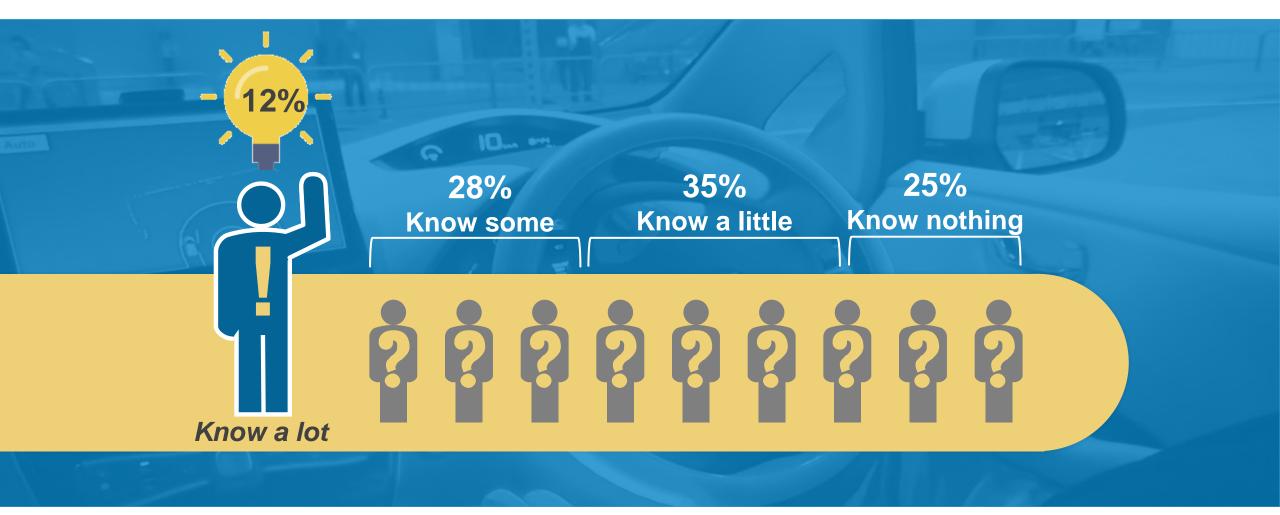


"I don't think all vehicles will be fully autonomous in my lifetime"



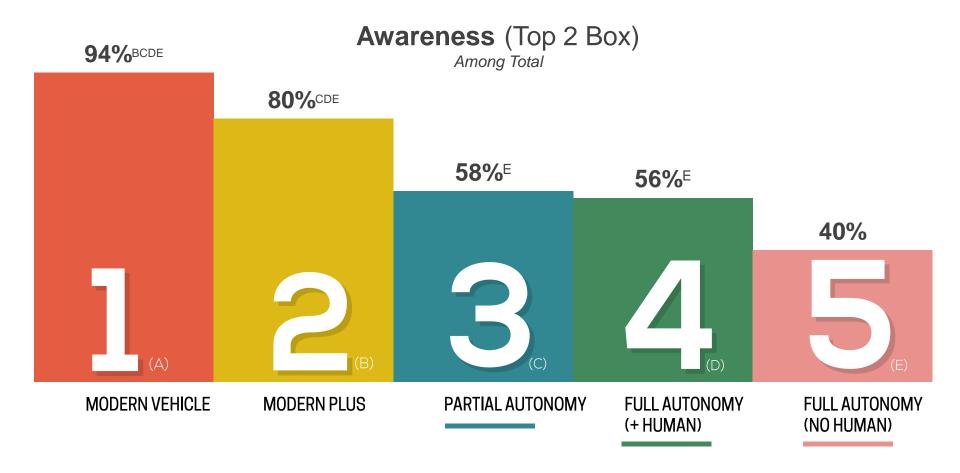


> 6-in-10 know little or nothing about Autonomous Vehicles





Only about half of Americans are aware of higher levels of autonomy, with a large drop off from Level 2 Modern Plus to Level 3 Partial Autonomy



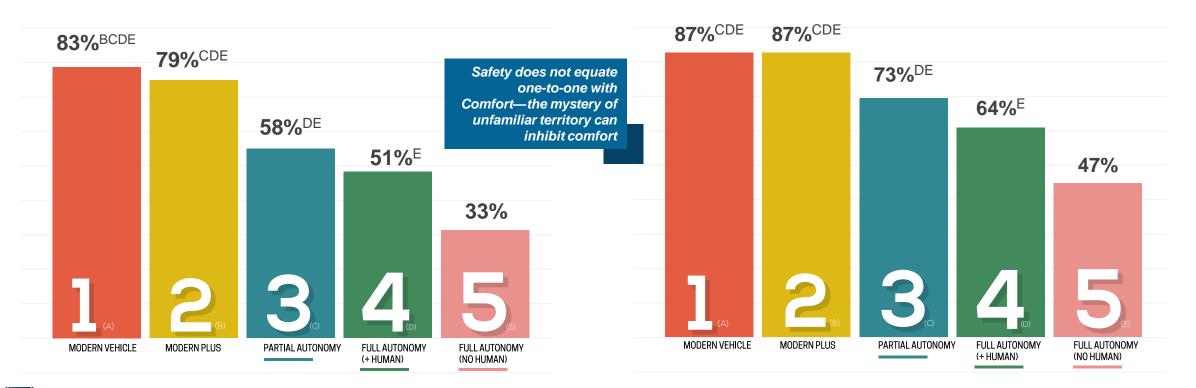


Americans are most comfortable with vehicles on the road today, even thinking Levels 1 Modern Vehicle & 2 Modern Plus are significantly safer than higher levels of autonomy



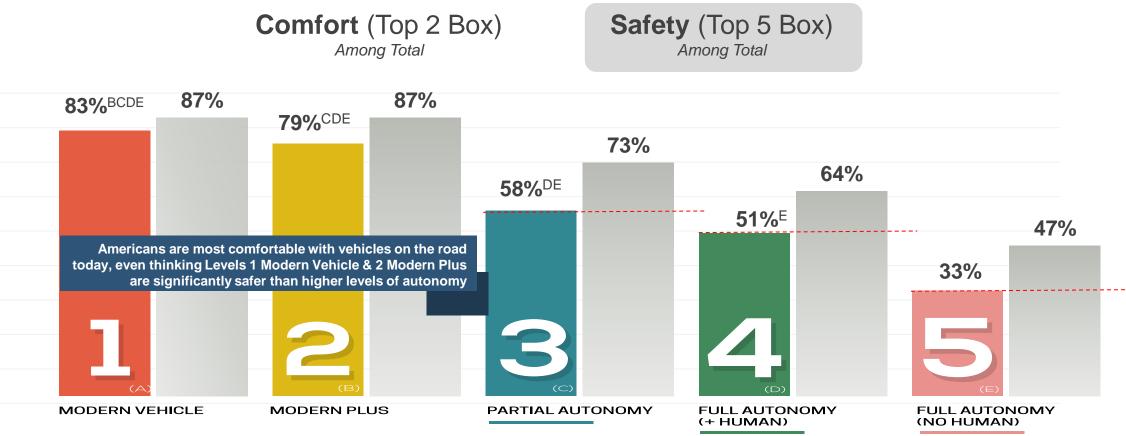
Safety (Top 5 Box)

Among Total





Safety does not equate one-to-one with Comfort when it comes to higher levels of vehicle autonomy as the mystery of unfamiliar territory may inhibit comfort





Though lower levels of autonomy are most associated with daily life activities, the jump to higher levels of autonomy is not far off (as Levels 3 Partial Autonomy and 4 Full Autonomy (+Human) are similar to Level 1 Modern Vehicle)





3 (C) PARTIAL AUTONOMY

FULL AUTONOMY (+ HUMAN)

(E)
FULL AUTONOMY
(NO HUMAN)

| | | Levels 1 | | | | |
|--|--------------------------|--------------------------|----------------------------|---------------------------|---------------------------|-----------------|
| Going shopping/running errands | | 34% ^{CDE} | 45% ACDE | 31% ^E | 30% ^E | 14% |
| Going to the movies/out to eat | day-to-day activities | 33% ^{DE} | 45% ACDE | 31% ^E | 29% ^E | 15% |
| City street travel | | 31% ^{DE} | 44% ^{ACDE} | 34% ^{ADE} | 30% ^E | 16% |
| Shuttling kids to school/activities | | 30% ^E | 45% ^{ACDE} | 30% ^E | 29% ^E | 18% |
| Heavy traffic | | 27% ^E | 43% ^{ACDE} | 30 % ^{AE} | 30% ^{AE} | 20% |
| Freeway and highway travel | lowas | 26% | 37% ^{AE} | 40% ^{ABE} | 41% ^{ABE} | 25% |
| Road trips longer than 100 miles | longer trips or | 24% | 30% ^{AE} | 37% ABE | 44% ABCE | 26% |
| Traveling for seniors | special situations | 16% | 28% ^A | 26% ^A | 37% ABC | 37% ABC |
| In situations that may involve alcohol | | 9% | 15% ^A | 13% ^A | 28% ABC | 59% ABCD |



Levels 3,4 and 5 are currently viewed for longer trips or special situations

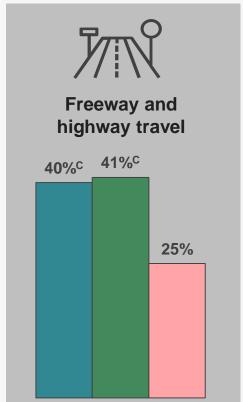


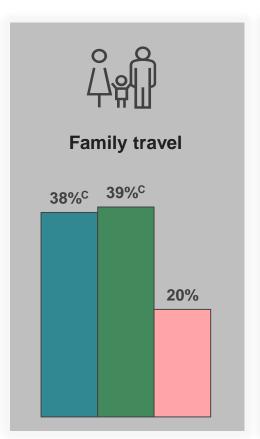


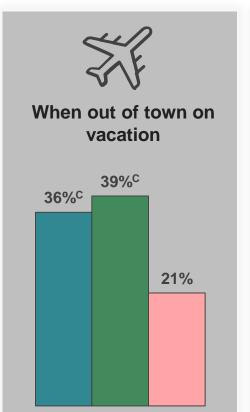
Within the higher levels of autonomy, Levels 3 Partial Autonomy & 4 Full Autonomy (+ Human) are perceived virtually identically in terms of utility [Level 5 drops off notably]

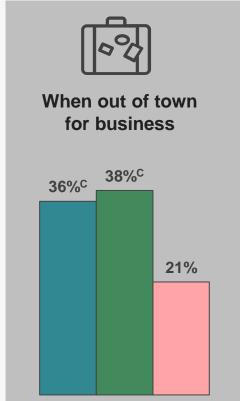
Occasion Fit

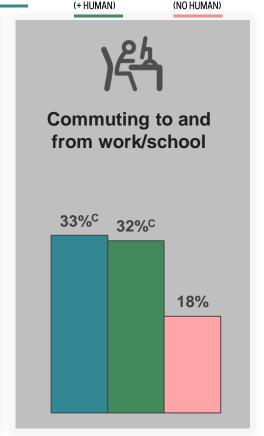
Among Total







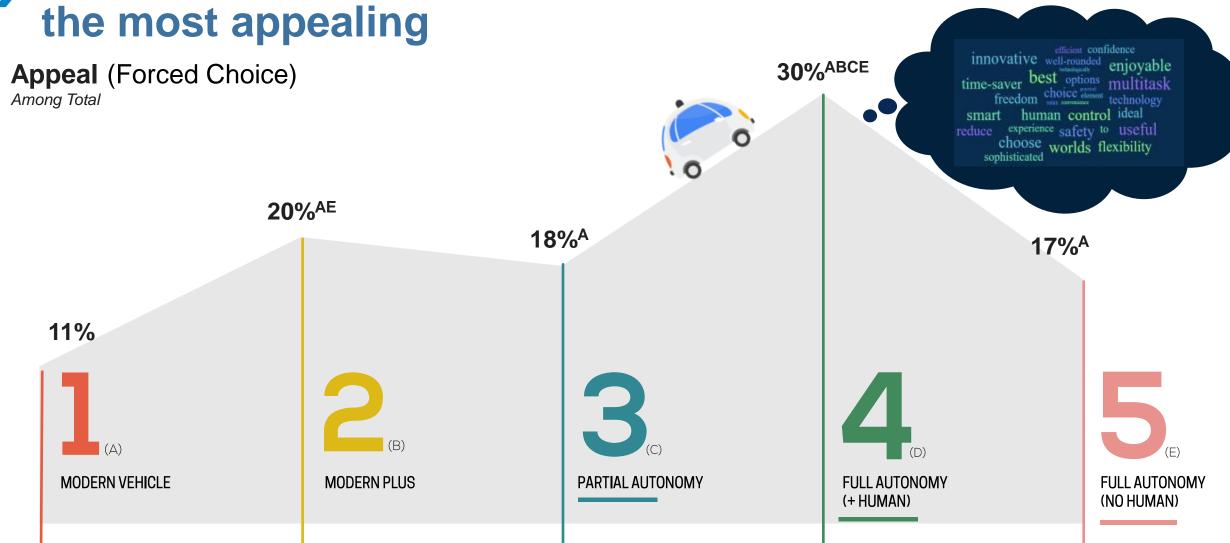




FULL AUTONOMY



However - Level 4 Full Autonomy (+ Human) autonomy is





Level 4 Full Autonomy (+ Human) hits the "sweet spot" by providing all the benefits of vehicle autonomy without stripping away driver control

PARTIAL AUTONOMY Not being able to "fully relax" is a top deterrent

FULL AUTONOMY (+ HUMAN)

"Having the option to drive myself" is a main attractor

FULL AUTONOMY (NO HUMAN)

Having "no option to drive" is one of the top deterrents



"It seems to offer the best rounded experience—allows people to not have to drive if they don't want to/can't for any reason (age, sickness, just don't feel like it, unfamiliar area, etc.), yet allows for one to drive if needed or desired."

"It gives me the option to drive or not drive. There are times that it is fun to drive a car—out in the country where you can stop or slow down to look at things. But for a long trip, the full autonomy would be great."

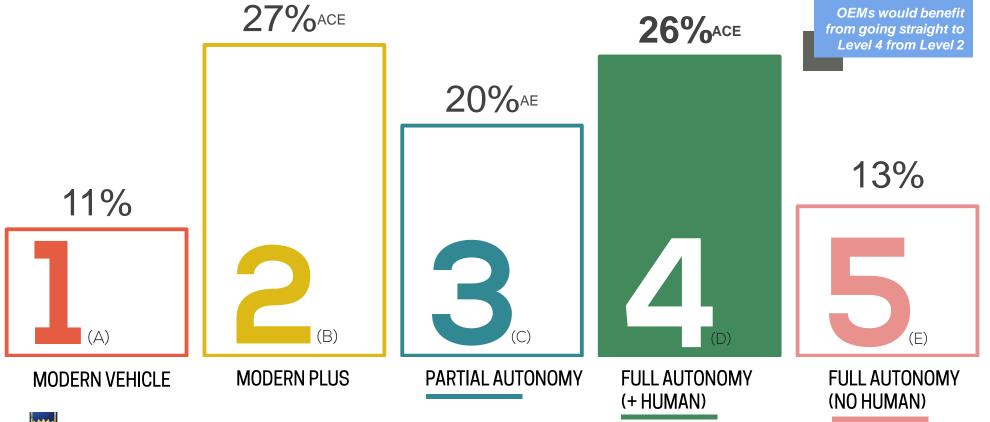
"Because even though it is chiefly autonomous it still is equipped with seating, a steering wheel and brakes so that a human can take over if needed. Machines are not 100% reliable and we need the human element to fall back on."



> Americans want to buy Level 4 Full Autonomy (+ Human) as much as vehicles available today

Purchase Consideration (Forced Choice)

Among Plan to Purchase/Lease Vehicle





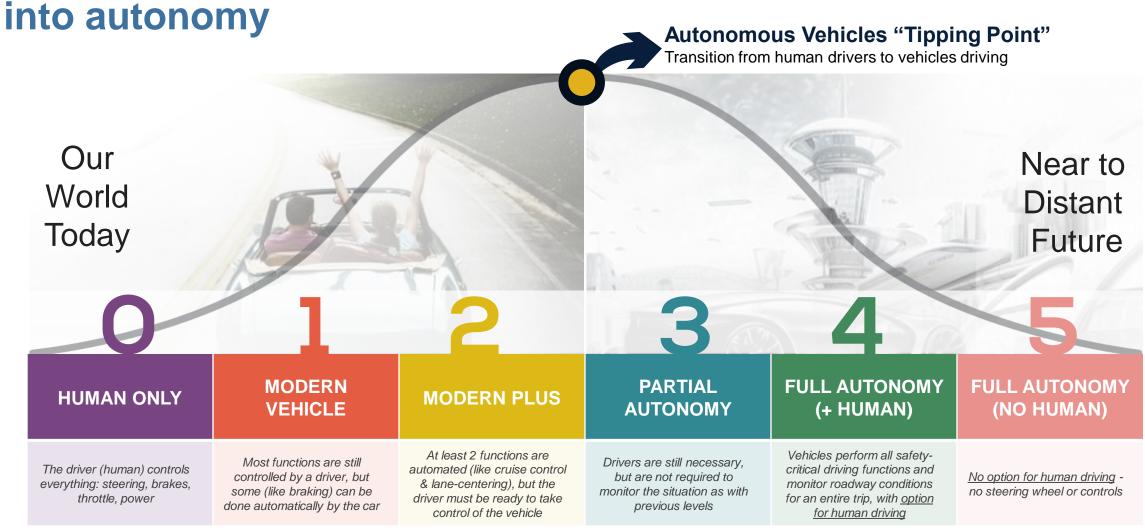
is the most appealing to me because it allows the vehicle to take over all driving tasks for the human, while still allowing the human to have 'executive control' in case of emergencies, system errors, or other unforeseen circumstances.





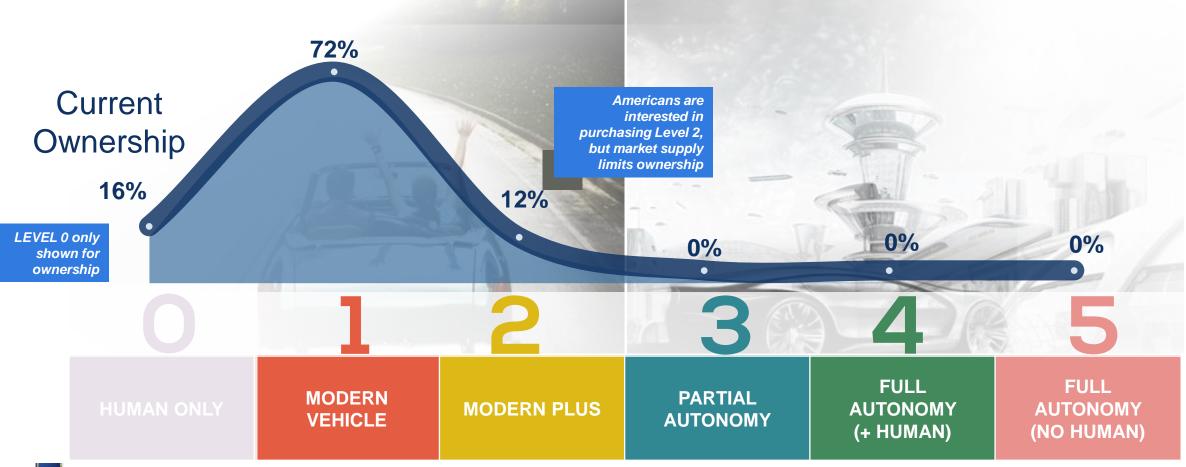


Level 3 Partial Autonomy adoption is when the market "tips" into autonomy





> The majority of vehicles on the road today are Level 1 Modern Vehicle





Perceived expense and fear of software malfunction hold most Americans back from "tipping" into autonomy

Trial is the biggest catalyst to adoption, after safety and price



| | 3 | 4 | 5 |
|---|-----|-----|-----|
| More expensive than can afford | 47% | 51% | 50% |
| Expensive to fix | 44% | 46% | 48% |
| Software hack | 40% | 41% | 44% |
| Software/computer crash | 39% | 42% | 47% |
| Trust myself to drive more than technology | 31% | 33% | 38% |
| Concerned about interaction between AV & Non-AV | 31% | 34% | 37% |
| Can't fully relax | 28% | 26% | 27% |
| Fearful of vehicles not communicating well | 28% | 32% | 37% |
| No option to drive | 13% | 14% | 43% |



Catalysts to Autonomy

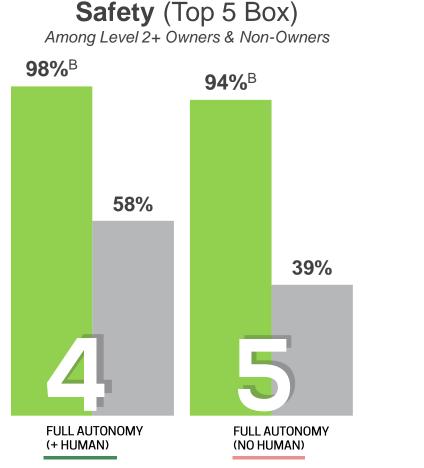
| | 3 | 4 | 5 |
|--|-----|-----|-----|
| Proven/shown to be a safe vehicle | 42% | 52% | 51% |
| Available in my price range | 37% | 51% | 53% |
| Insurance company told me my rates would go down | 26% | 34% | 35% |
| Try technology without fully committing | 24% | 30% | 30% |
| Tax breaks | 22% | 29% | 28% |
| It had the most advanced technology | 22% | 24% | 20% |
| Proven/shown to be more environmentally friendly | 18% | 20% | 19% |
| Came standard in vehicle I wanted | 17% | 27% | 28% |

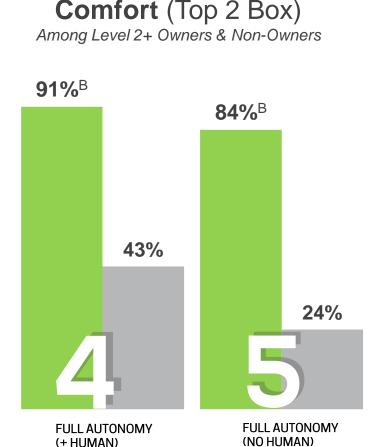
FIRST-HAND EXPERIENCE (like test drives, short-term leasing, or daily rentals) will be crucial in spurring Autonomous Vehicle adoption



Level 2+ Partial Autonomy Owners are significantly more favorable toward higher levels of Autonomy, and are less likely to think people should always have the option to drive themselves



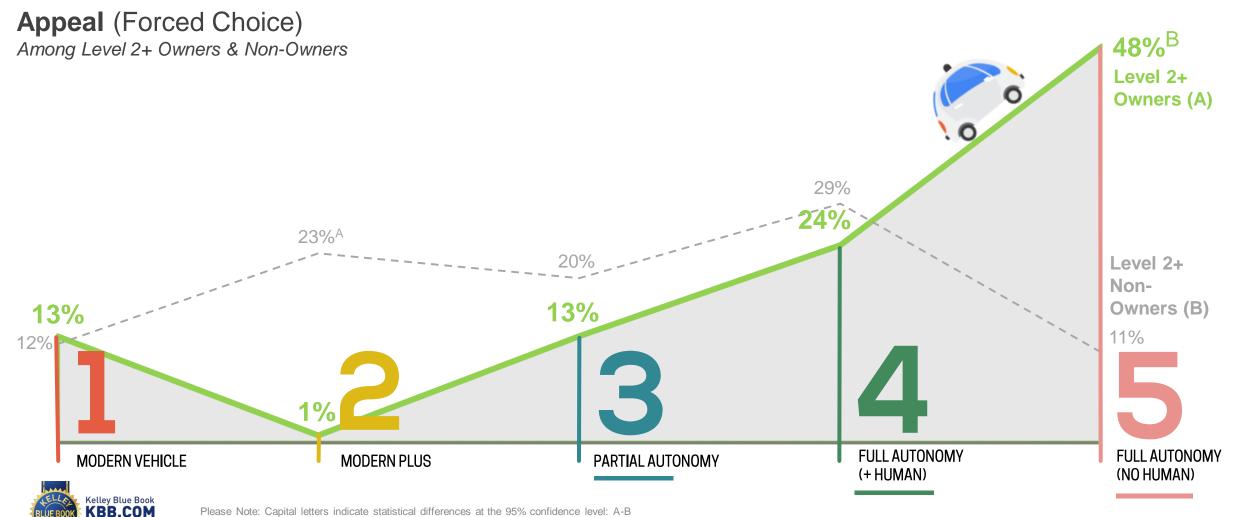






Please Note: Capital letters indicate statistical differences at the 95% confidence level: A-B Level 2+ includes those who own vehicles with cutting-edge Autonomous features but haven't quite reached full Level 3 capability (self identified) Base: Level 2+ Owners (n=77), Level 2+ Non-Owners (n=1573)

➤ Level 2+ Partial Autonomy Owners find Level 5 (No Human) significantly more appealing than Non-Owners



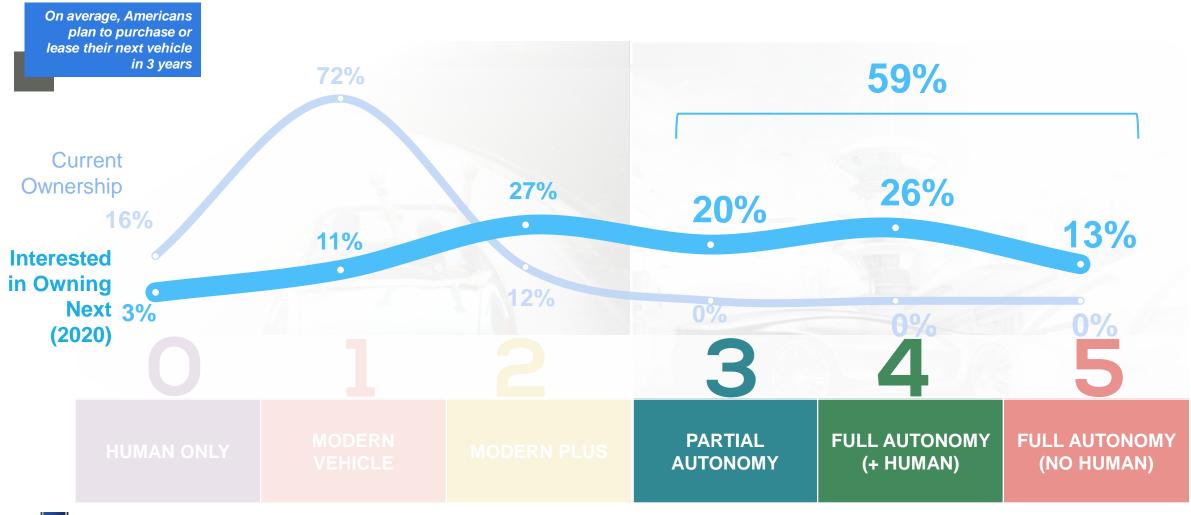
> Tipping point methodology

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To project the future automotive landscape, we combined respondents' estimated timing of their next vehicle purchase/lease and the level of autonomy they would be most likely to purchase/lease

Assuming each level of autonomy was available When are you planning to purchase or lease your next vehicle? (Single Select) on the market today, what (among current vehicle owners/leasers) level of autonomy would Within the next year Current year Mid 2016 Within the next 2 years Mean is you be most likely to > Avg. yrs until next purchase + 3 years Within the next 3 years ~3 vears Within the next 4 years Year for projection = 2020purchase/lease? Within the next 5 years or more (Single Select) I am not planning to purchase/ lease another vehicle at all, ever (among those planning to purchase/lease another vehicle) Level 0 Level 5 Interested in **Owning Next** *Every respondent required to choose a level (2020)**Determining** the year for Calculating the the projection projection line **FULL AUTONOMY** PARTIAL FULLAUTONOMY (NO HUMAN) AUTONOMY (+ HUMAN) Kelley Blue Book

By 2020, assuming all levels of autonomy were available, 59% of consumers would be interested in purchasing/leasing higher levels of autonomy

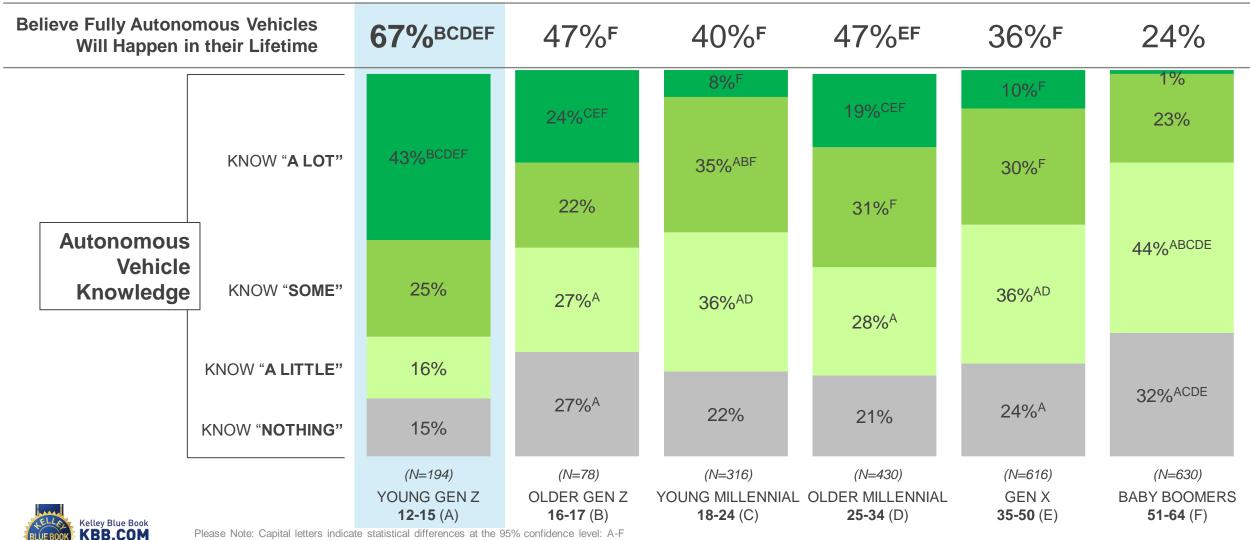








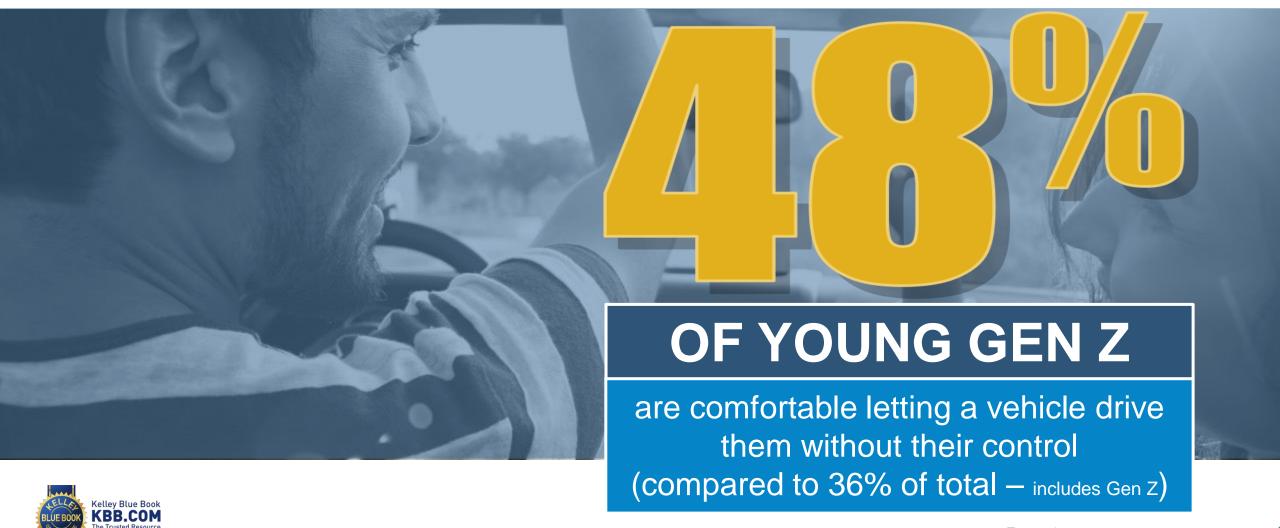
Their generation feels as though they are the most educated about Autonomous Vehicles; Boomers feel the least educated



Please Note: Capital letters indicate statistical differences at the 95% confidence level: A-F Base: By Generation (varies)

ATT5. Do you believe all vehicles will be fully autonomous/self-driving in your lifetime? AV2. How much do you know about Autonomous Vehicles?

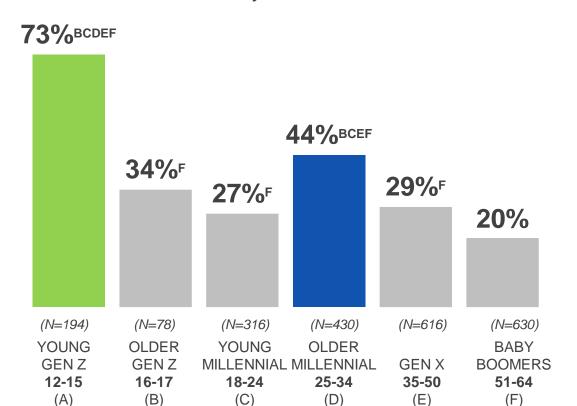
> Pre-driving Young Gen Z don't crave vehicle control like other cohorts



Young Gen Z are the most comfortable and feel safest with the highest level of vehicle autonomy, with Older Millennials, who have actual purchasing power today, are not very far behind



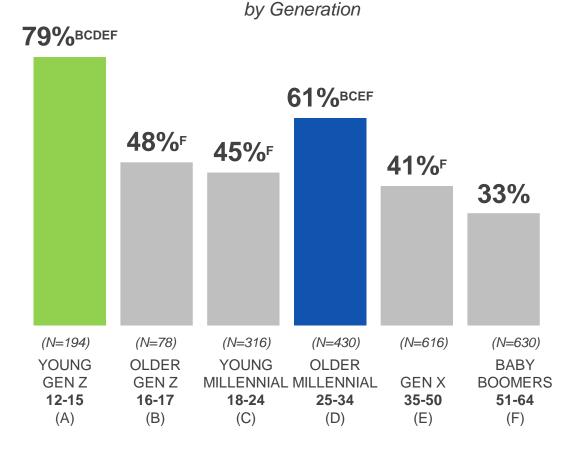
by Generation



Kelley Blue Book

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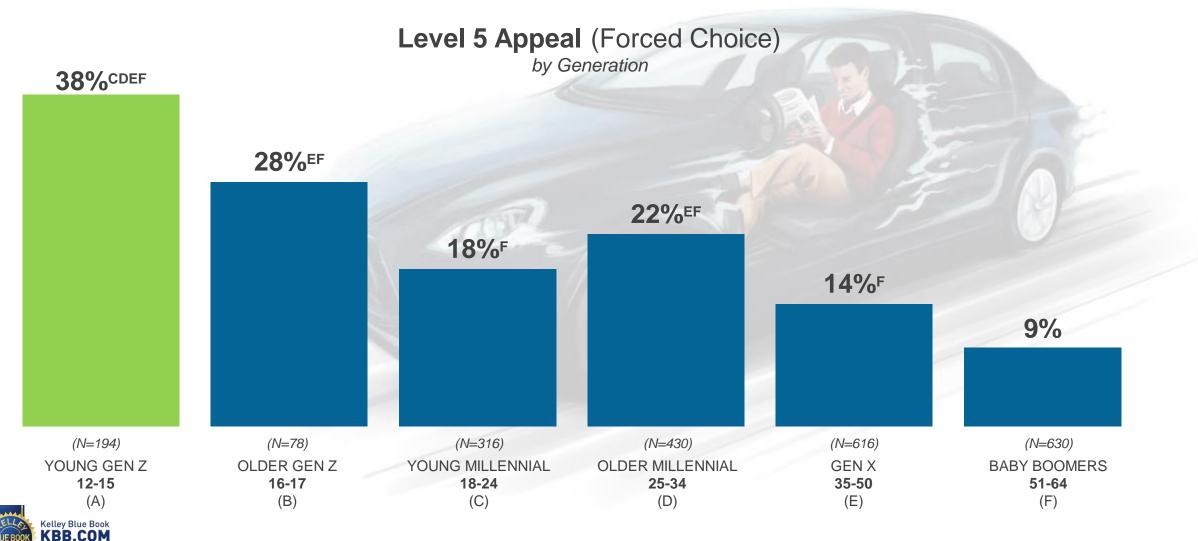
Level 5 Safety (Top 5 Box)

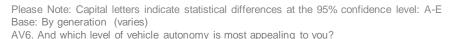




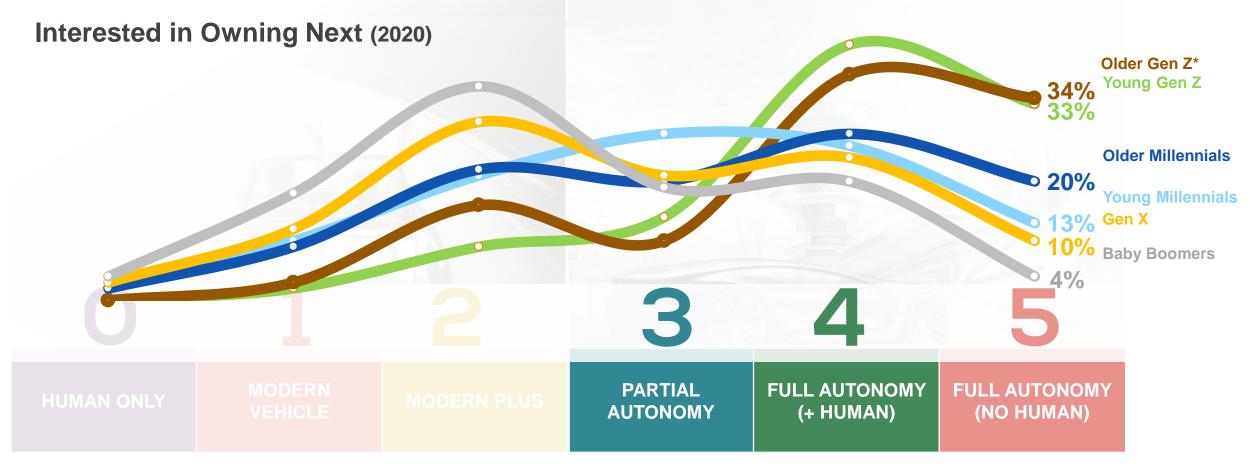
AV7. How safe would you feel traveling in a vehicle at each level of autonomy?

Across generations, Level 5 Full Autonomy (No Human) is by far the most appealing to Young Gen Z





Young Gen Z won't need or experience a tipping point, as they generally would like their first vehicles to be Level 4 Full Autonomy (+ Human) and 5 Full Autonomy (No Human)

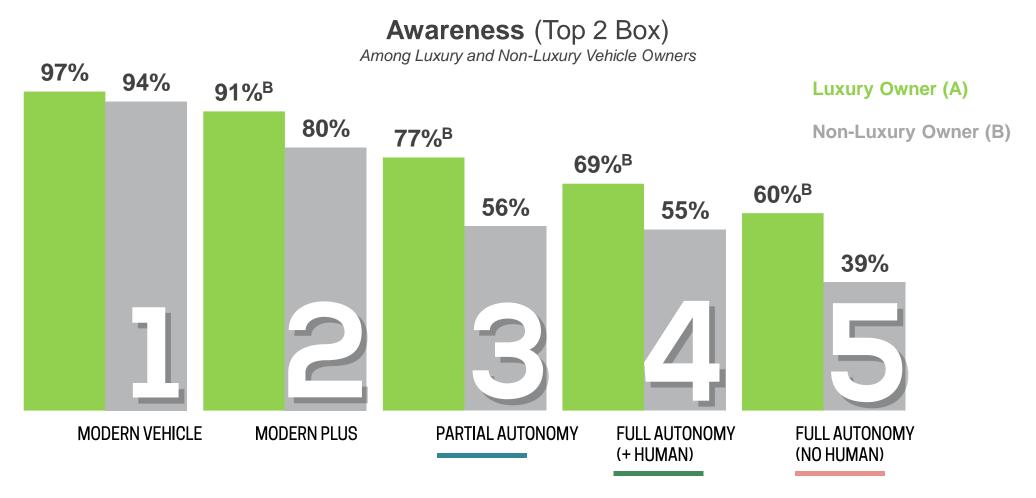








Luxury Vehicle Owners have more awareness of higher levels of Autonomy versus Non-Luxury Vehicle Owners, particularly for Level 5 Full Autonomy (No Human)





Compared to Non-Luxury Vehicle Owners, Luxury Vehicle Owners are more comfortable with higher levels of Autonomy, also finding them safer

Comfort (Top 2 Box)

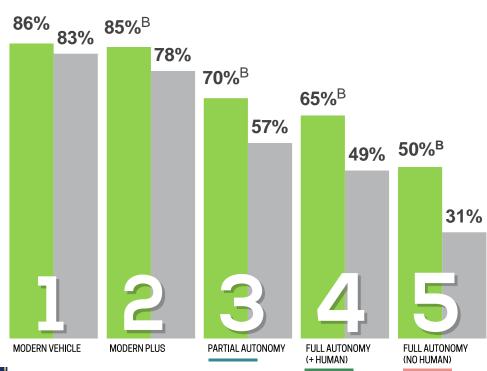
Among Luxury and Non-Luxury Vehicle Owners

Luxury Owner (A)

Non-Luxury Owner (B)

Safety (Top 5 Box)

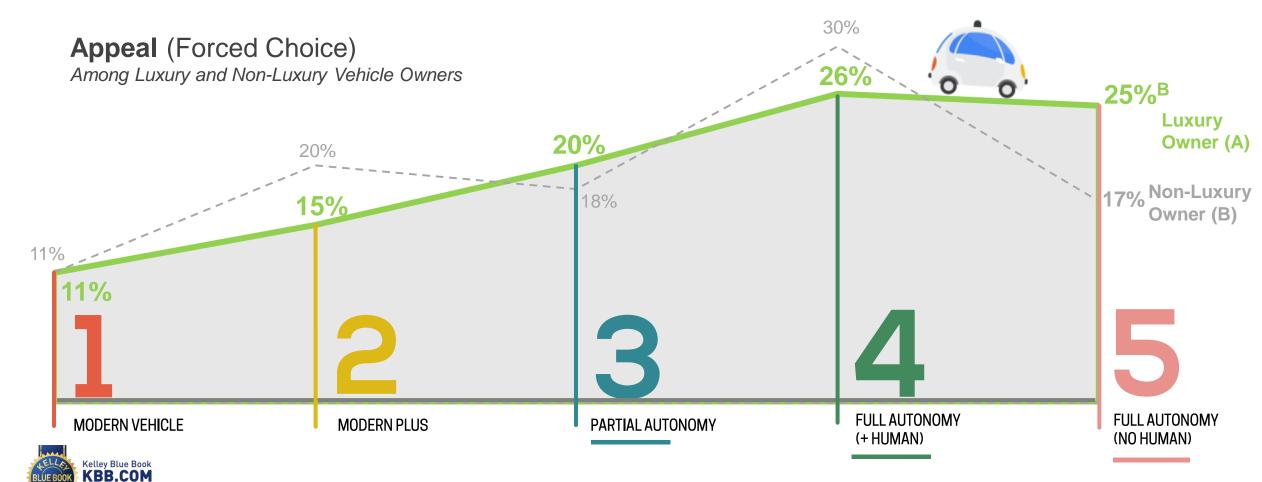
Among Luxury and Non-Luxury Vehicle Owners







Level 4 Full Autonomy (+ Human) and Level 5 Full Autonomy (No Human) are equally appealing to Luxury Vehicle Owners, while Non-Luxury Vehicle Owners favor Level 4 Full Autonomy (+ Human)





Americans Are Still Revving Up to the Idea of Autonomous Ride-Sharing Services



Americans lean slightly more toward human drivers rather than self-driving vehicles when ride-sharing

I would prefer to use services such as taxis, Uber or Lyft with self-driving vehicles

44%

56%

I would prefer to use services such as taxis, Uber or Lyft with human drivers









However, those who already use ride-sharing services are more likely to give autonomous ride-sharing vehicles a chance versus their counterparts

I would prefer to use services such as taxis, Uber or Lyft with

self-driving vehicles



Ride-Share User

51% 49%

42% 58%

Non Ride-Share User



I would prefer to use services such as taxis, Uber or Lyft with

> human drivers

Ride-Share Users are **significantly more comfortable letting a vehicle drive** them without their control versus Non Ride-Share Users



44% vs. 34%

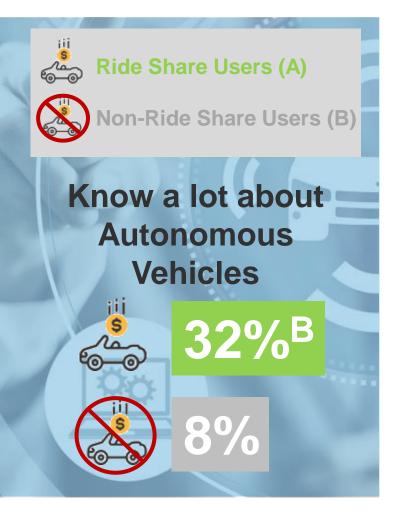


Ride-Share Users

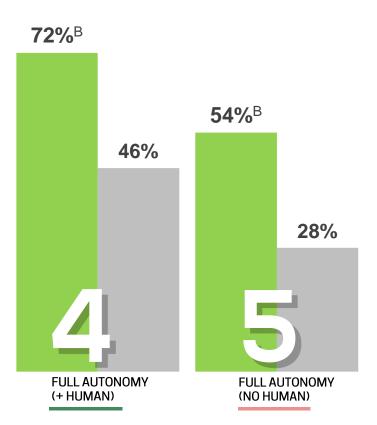
Non Ride-Share Users



Not only are Ride-Share Users more knowledgeable about Autonomous Vehicles, but they are more favorable toward higher levels of autonomy

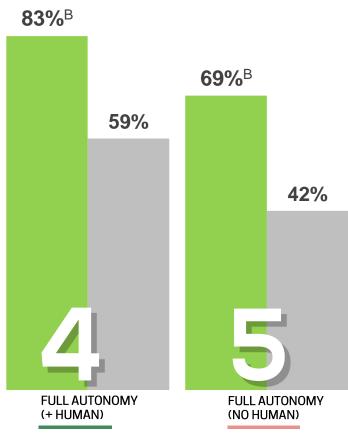






Safety (Top 5 Box)

Among Ride Share Users & Non-Users





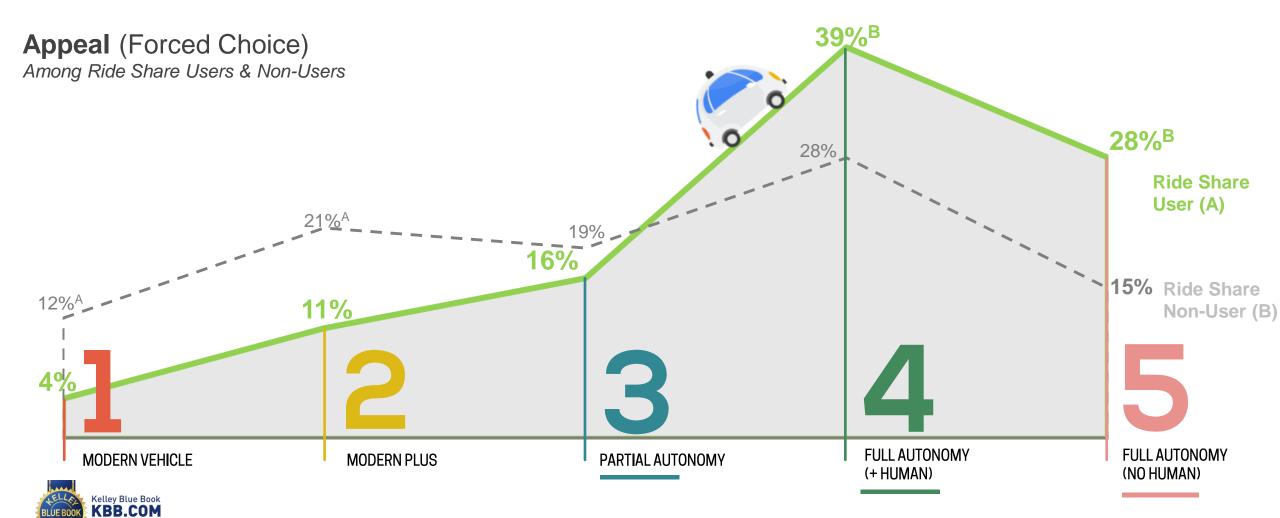
Please Note: Capital letters indicate statistical differences at the 95% confidence level: A-B Base: Ride Share User (n=405), Ride Share Non-User (n=1859)

AV2. How much do you know about Autonomous Vehicles?

AV7. How safe would you feel travelling in a vehicle at each level of autonomy?

AV8. Based on what you've seen, heard, or read, how comfortable are you with each level of vehicle autonomy?

Both Ride-Share Users and Non-Users find Level 4 Full Autonomy (+Human) the most appealing, but Ride-Share Users are significantly more likely to do so. They are also almost twice as likely to pick Level 5 Full Autonomy (No Human) as most appealing.



What's the story around Autonomous Vehicles?

- On the road to autonomy, interest peaks with Level 4 Full Autonomy (+ Human) as it offers the best of both worlds a fully Autonomous Vehicle that still provides the option to drive
- With most Americans living in a Level 1 Modern Vehicle world, Autonomous Vehicles are still a novel and almost foreign concept
- Americans will need convincing to reach a Level 5 Full Autonomy (No Human) future
- A quarter of Americans are enthusiastic about Autonomous Vehicles and show interest in purchasing higher levels of autonomy
- Experiencing higher levels of autonomy first-hand is a key to "tipping" into an autonomous future
- Young Gen Z and Luxury Owners are excited about and ready for an autonomous future



