

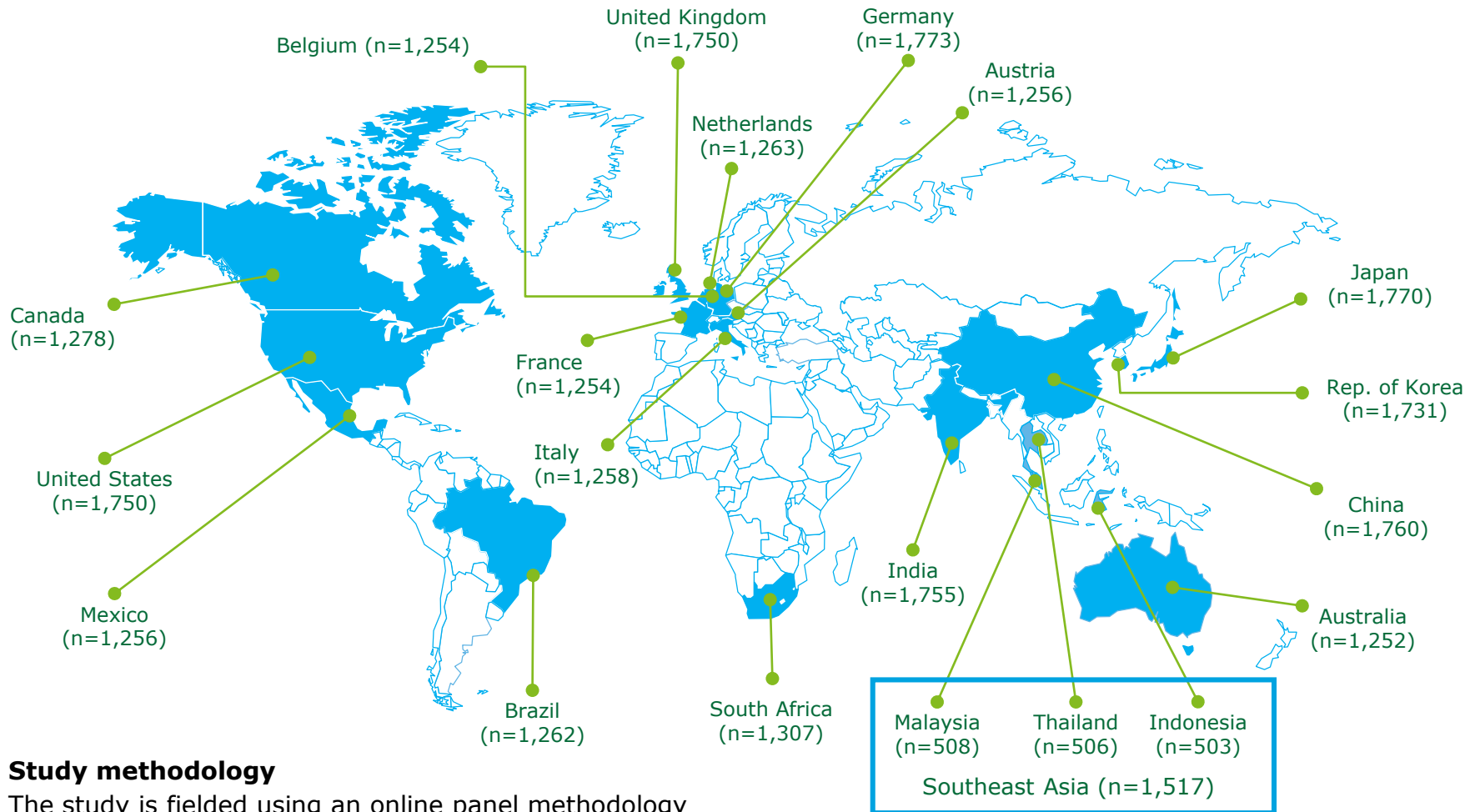


2019 Deloitte Global Automotive Consumer Study

Autonomous, connected vehicles and multi-modal mobility

Germany

The 2019 Deloitte Global Automotive Consumer Study includes more than 25K consumer responses across 20 global markets.



Study methodology

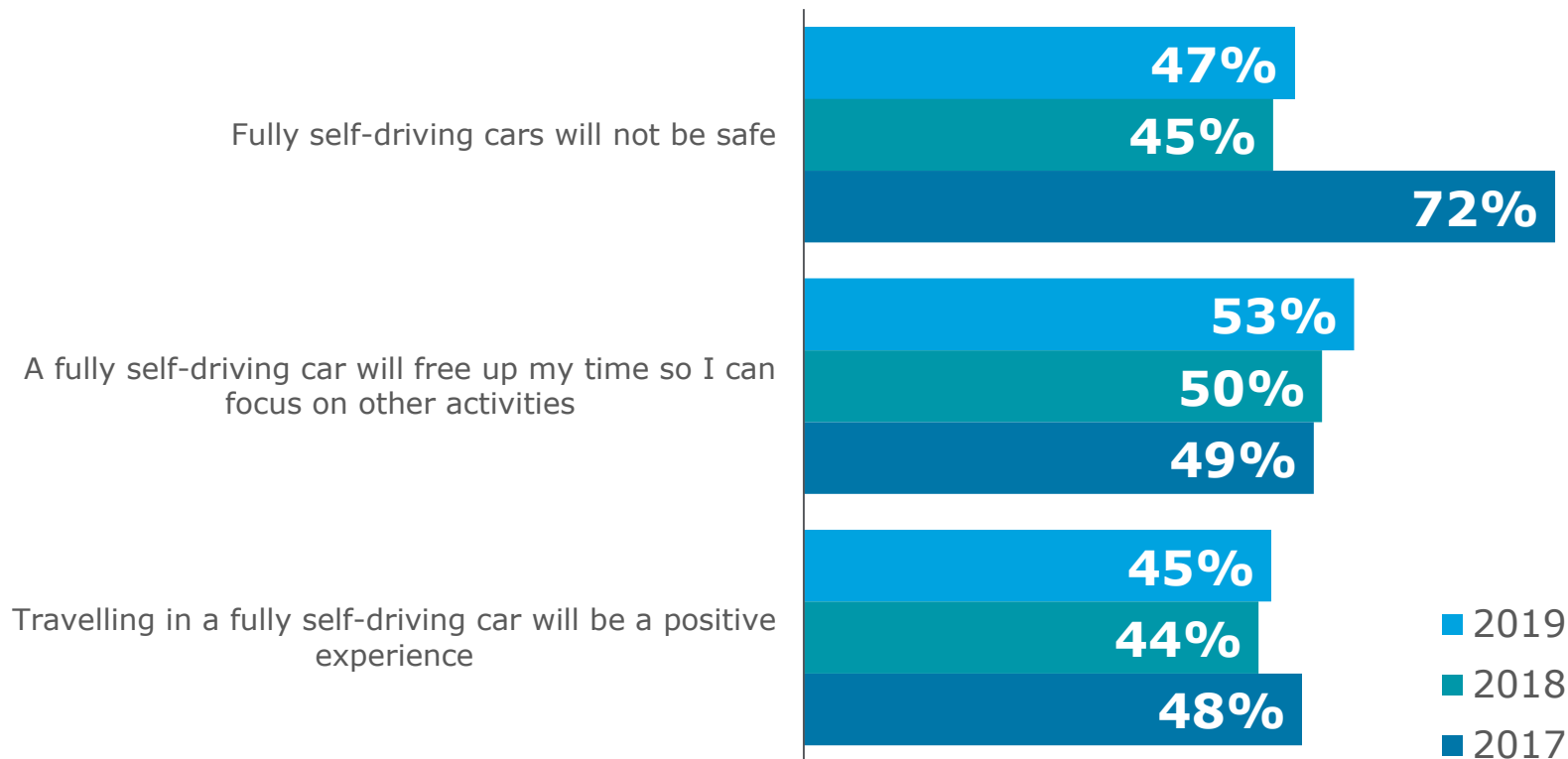
The study is fielded using an online panel methodology where consumers of driving age are invited to complete the questionnaire (translated into local languages) via email. It was fielded in 20 countries and designed to be nationally representative of the overall population in each market.

**What do consumers
think about autonomous
vehicle technology?**

Warming trend regarding autonomous vehicles has stalled

Consumers' perception about safety of self-driving vehicles hasn't improved over the last year

Percentage of consumers who agree that...



Note: Percentage of respondents who strongly agreed or agreed have been added together; did not consider "NA/Don't know" responses

Q3. To what extent do you agree with the following statements regarding future vehicle technology?

Sample size: n= 1,721 [2019], ; n= 1,697 [2018], n= 1,547 [2017]

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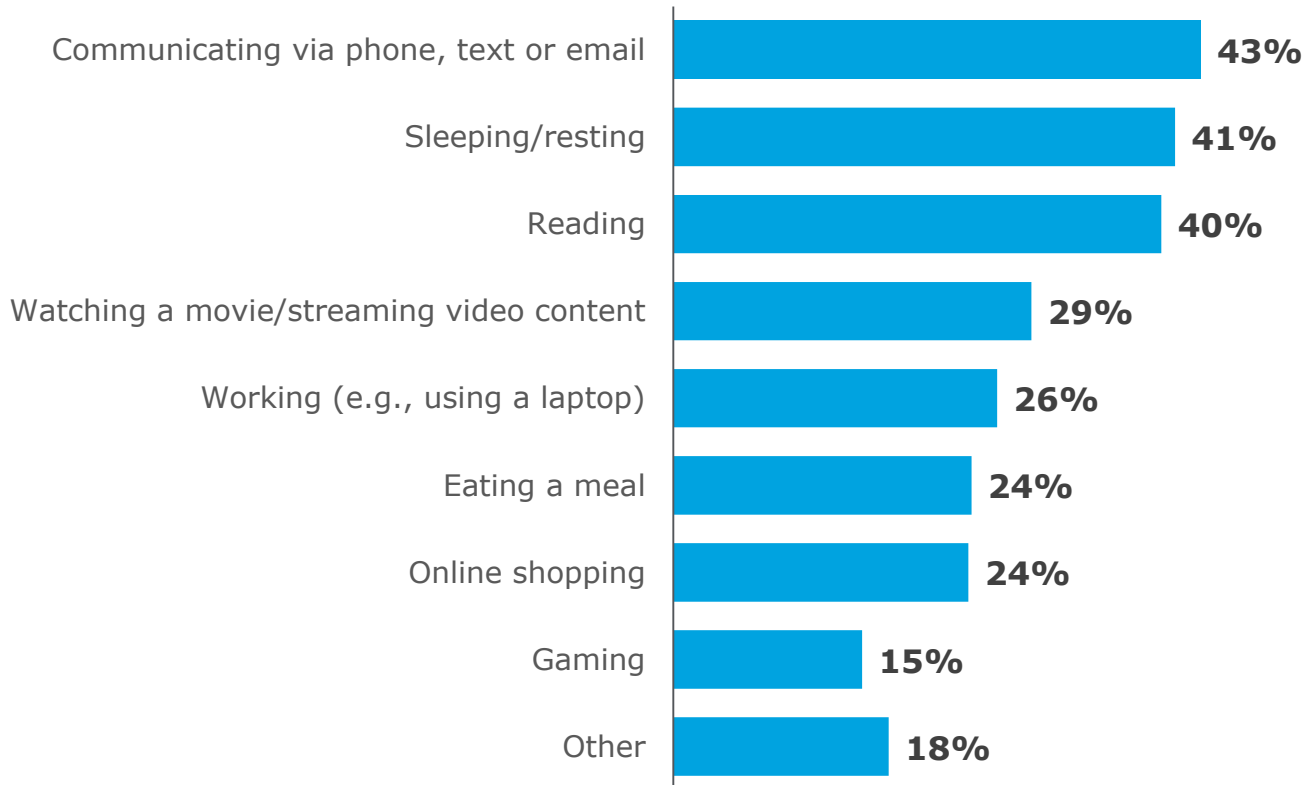
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People would most prefer to communicate while riding in an AV

Other top activities suggest that future vehicle interiors may not need to be that different than the ones we have now

Activities consumers would most likely engage in while riding in an autonomous vehicle



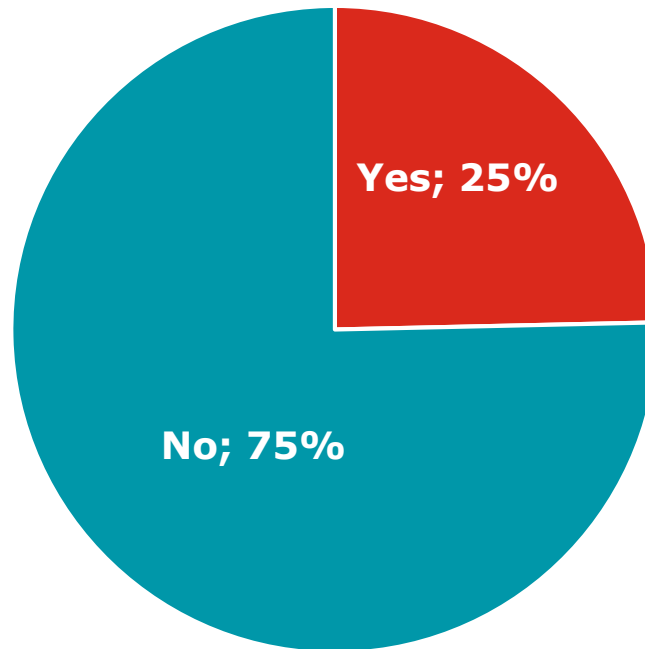
Q8. What activities would you most likely engage in while riding in a fully autonomous vehicle?

Sample size: n=1,773

But, one quarter of people are affected by motion sickness

Taking full advantage of riding in an AV to engage in a variety of activities may not be straight-forward for a significant number of people

Percent of consumers who suffer from motion sickness



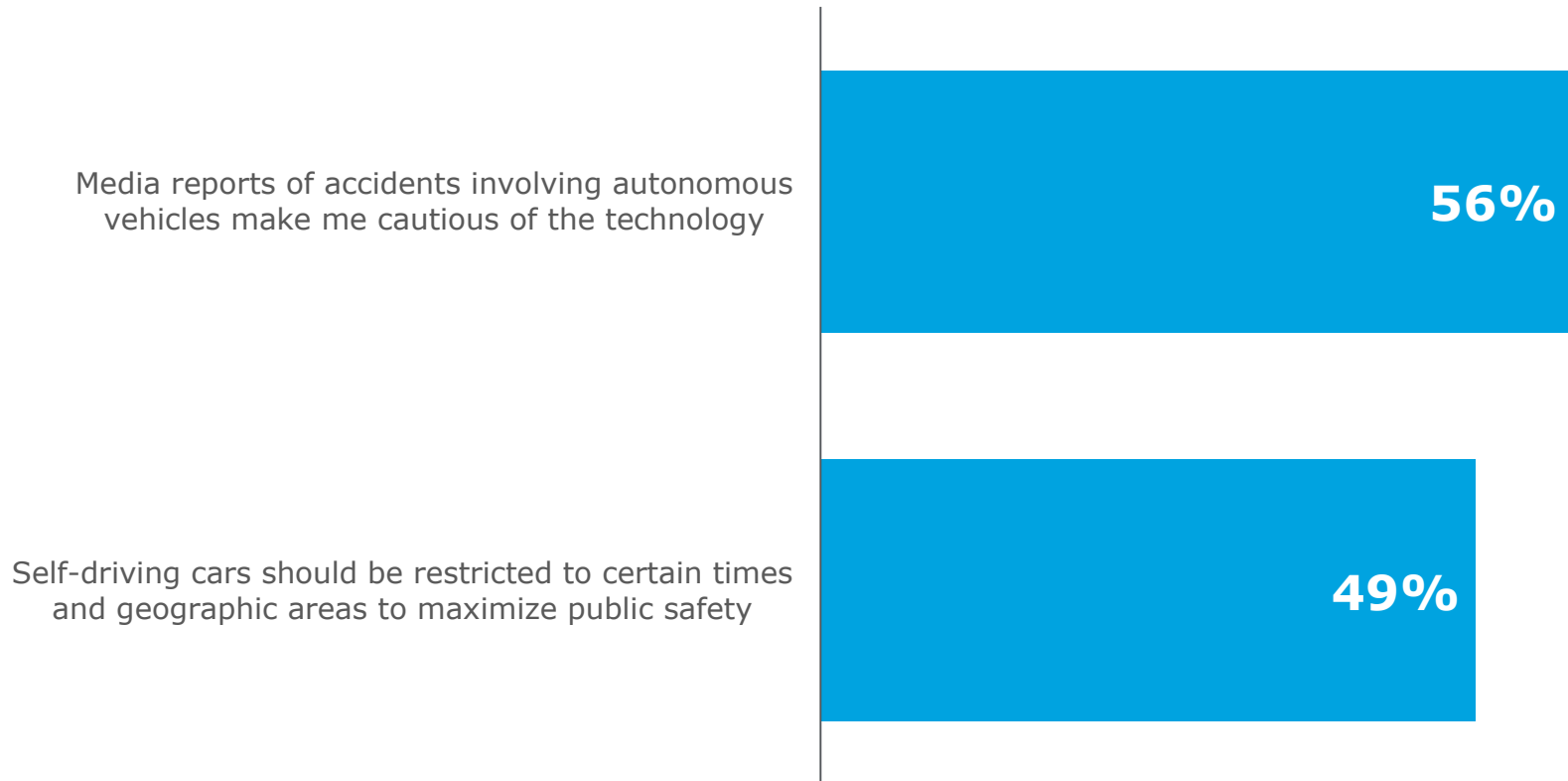
Q9. Does motion sickness currently prevent you from engaging in activities like reading or checking email while riding as a passenger in a vehicle?

Sample size: n=1,773

Negative media reports are impacting perceptions of AVs

Public safety along with recent accidents involving self-driving vehicles make consumers wary of advanced technologies

Percentage of consumer who agree that...



Note: Percentage of respondents who strongly agreed or agreed have been added together

Q3. To what extent do you agree with the following statements regarding future vehicle technology?

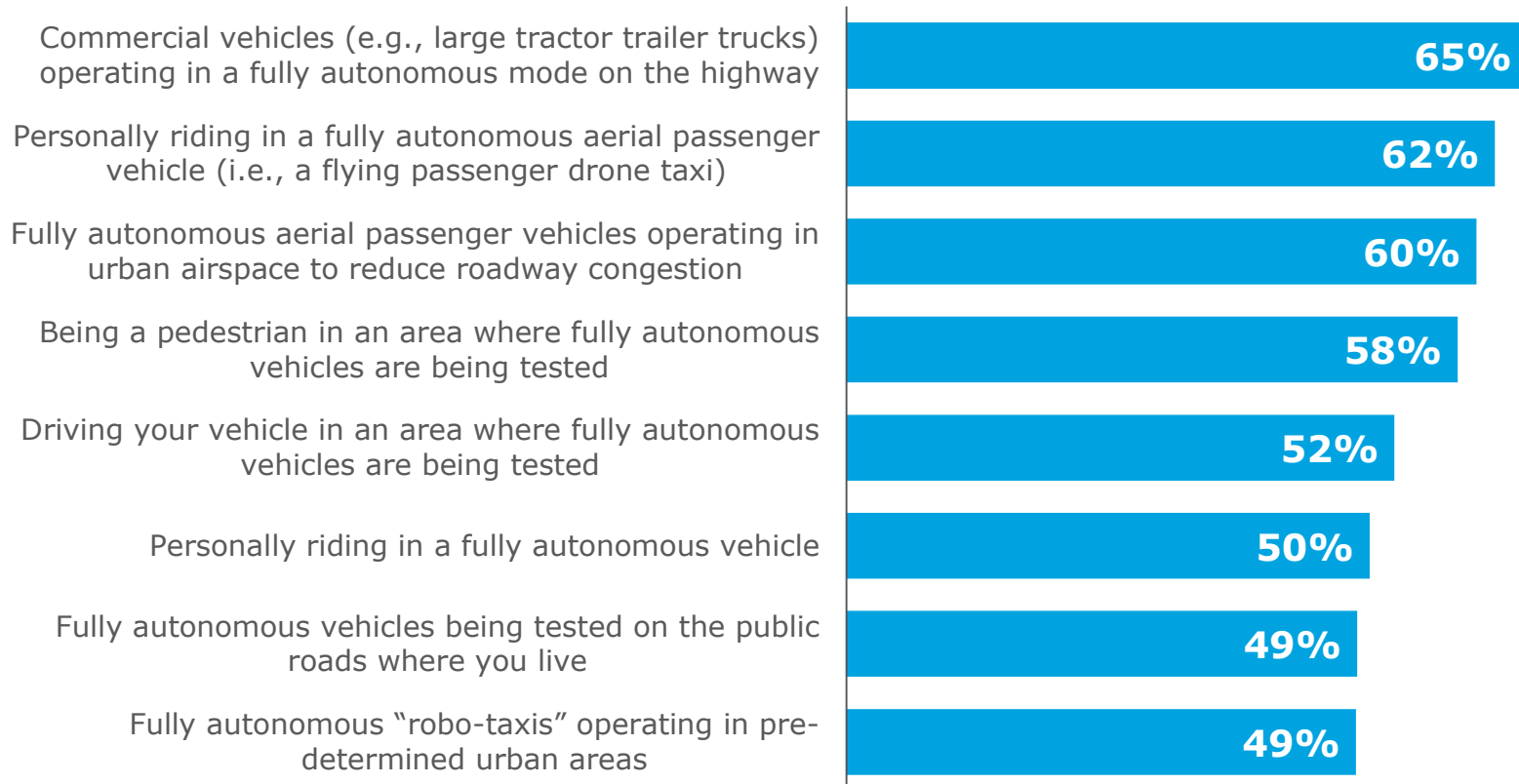
Sample size: n= 1,685

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Consumer apprehension goes well beyond riding in an AV

More than half of consumers are concerned to live, walk, or drive in an area where fully autonomous vehicles are in operation

Percentage of consumers who are concerned about...



Note: Percentage of respondents who are very concerned or concerned have been added together

Q4: How concerned are you with each of the following scenarios?

Sample size: n=1,773

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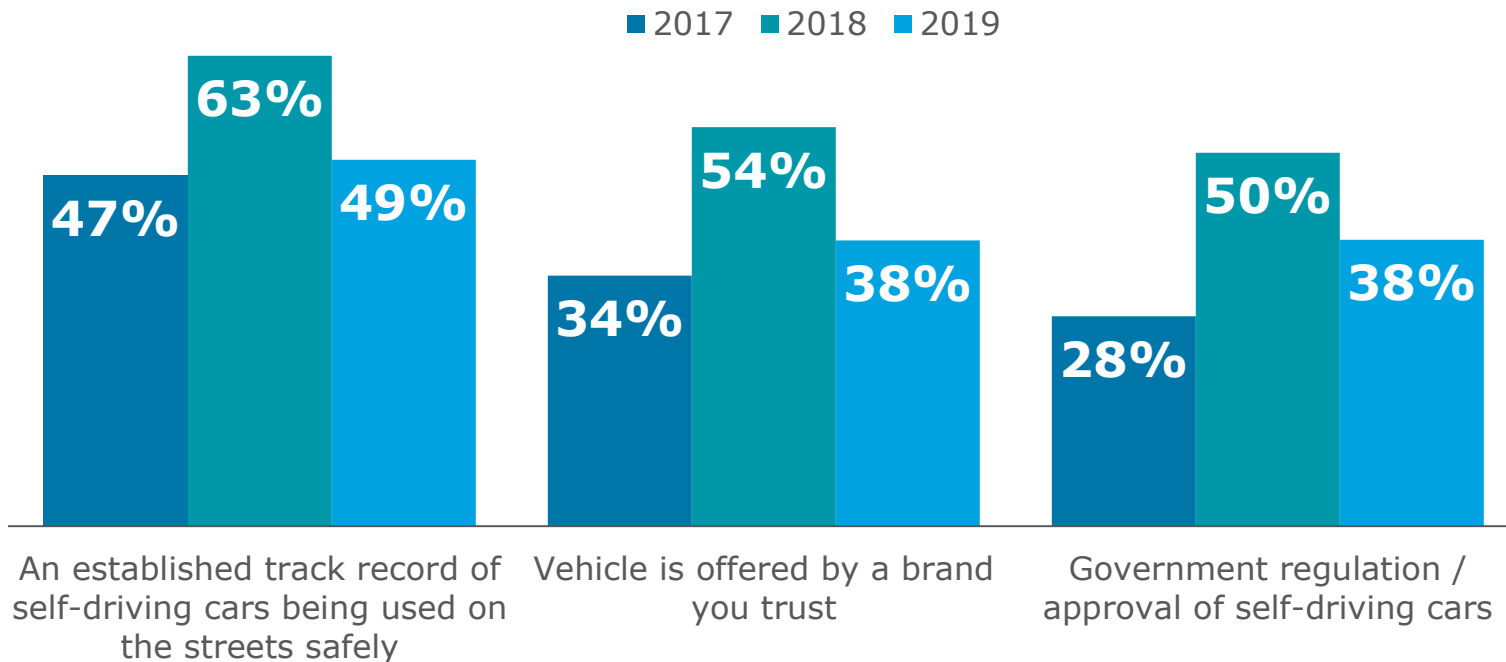
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Consumers still want an established safety record for AVs

Although the desire for government oversight of AV technology has cooled, there are still a significant number of people looking for it

Factors making consumers feel better about riding in a fully self-driving vehicle



Note: Percentage of respondents who strongly agreed or agreed have been added together; did not consider "Don't know" responses

Q6: Would the following factors make you more or less likely to ride in a self-driving car?

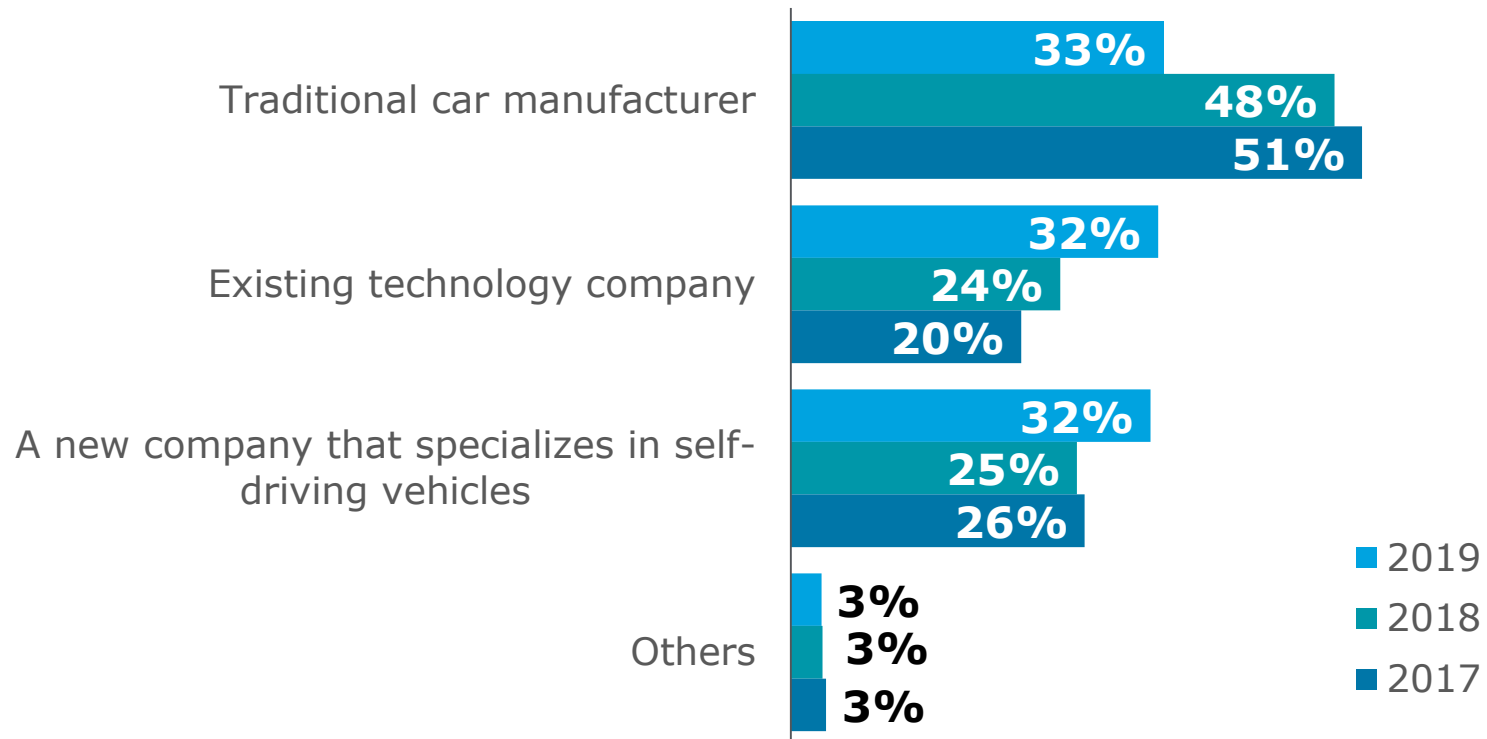
Sample size: n= 1,719 [2019] ; n= 1,624 [2018], n= 1,589 [2017]

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Speaking of trust, consumer faith appears to be shifting

Consumer trust in traditional OEs is declining while specialists and existing technology companies gain ground

Type of company consumers trust the most to bring fully self-driving technology to market



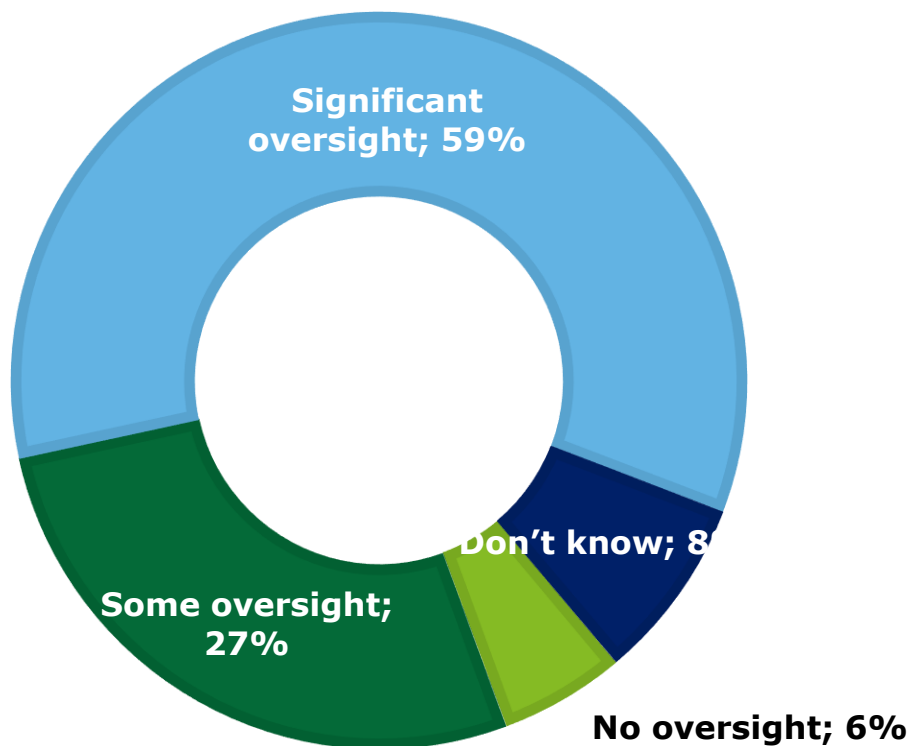
Q10: Which of the following type of company would you trust the most to bring fully autonomous (self-driving) vehicle technology to the market?

Sample size: n= 1,773 [2019], n= 1,759 [2018], n= 1,743 [2017]

Majority of consumers want a lot of regulatory oversight for AVs

Among those that want government oversight, the consensus appears to point to a desire for significant involvement to set standards

Expected level of government oversight (% of consumers)



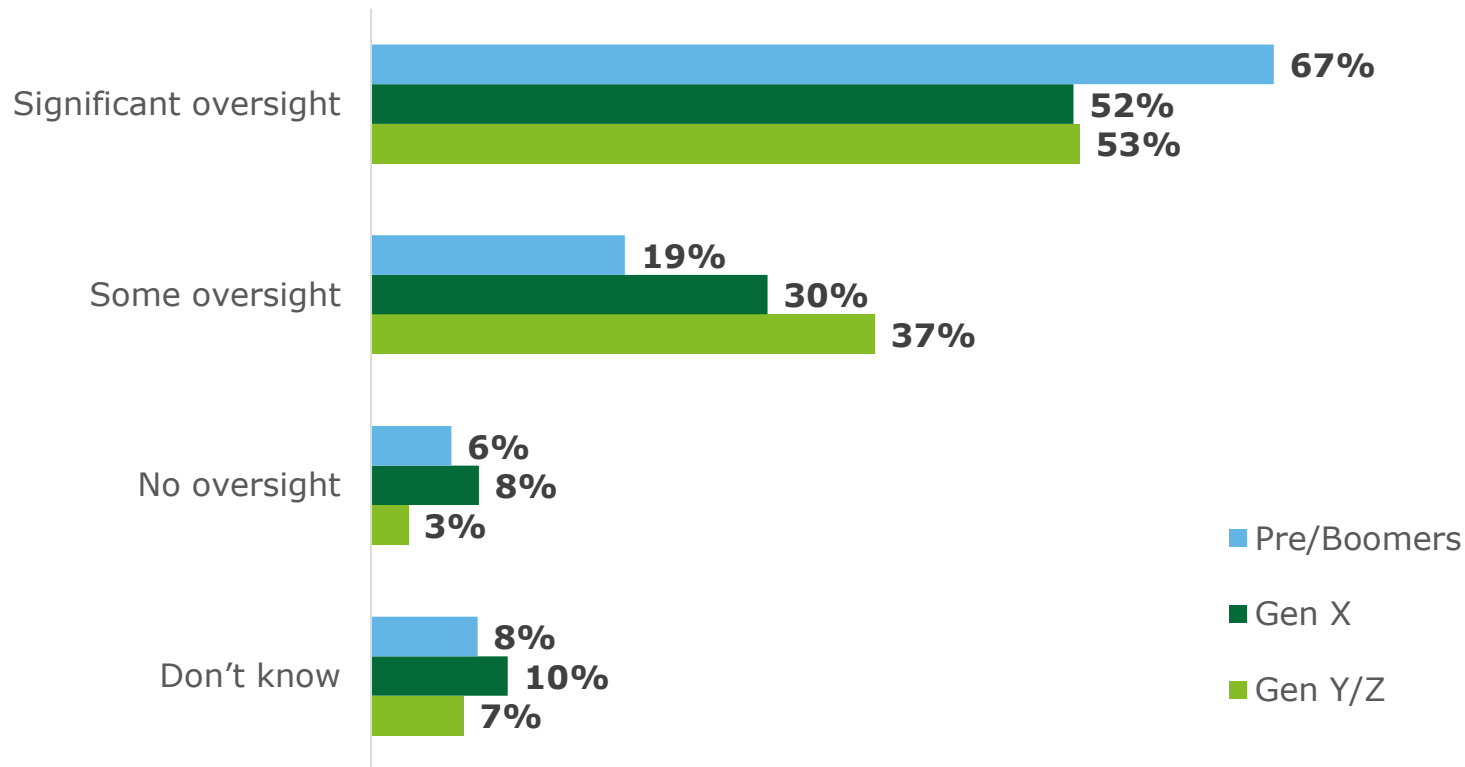
Q7: To what extent do you think government should be involved in the development and use of autonomous vehicles by providing oversight and standards?

Sample size: n= 1,773

Older consumers leading the charge for regulatory oversight

Younger consumers are more moderate when it comes to the amount of government oversight desired regarding AVs

Expected level of government oversight (% of consumers)



Q7: To what extent do you think government should be involved in the development and use of autonomous vehicles by providing oversight and standards?

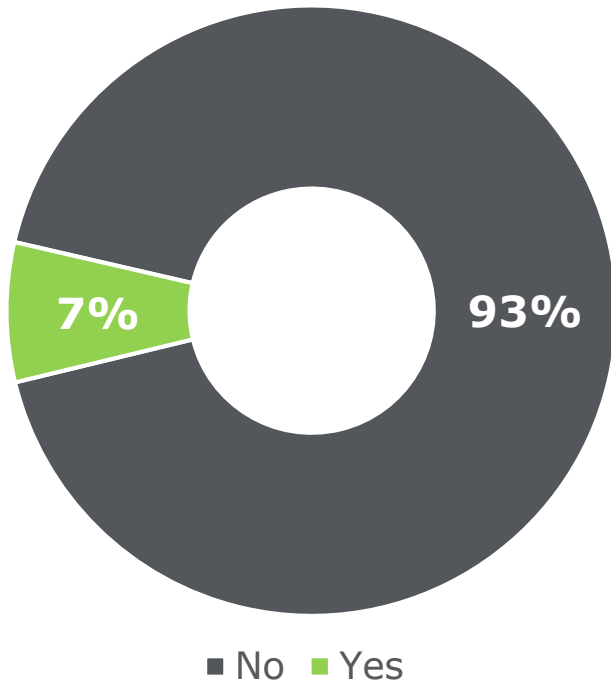
Sample sizes - [Pre/boomers, N= 820; Gen X, N= 373; Gen Y/Z, N= 580]

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Very few consumers have experienced an AV first-hand

However, half of the consumers who haven't experienced an AV said they are at least somewhat interested in giving it a try

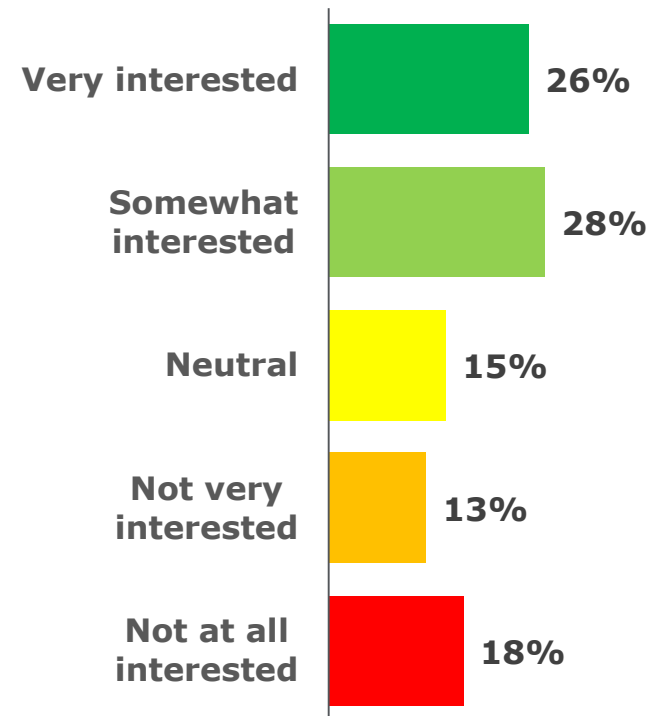
Percentage of consumers that have experienced an autonomous vehicle



Q5. Have you had the opportunity to ride in a fully autonomous vehicle as part of a demonstration or pilot program?

Sample size: n=1,773

Percentage of consumers who are interested in riding in a fully autonomous vehicle



Q5a. To what extent are you interested in riding in a fully autonomous vehicle?

Sample size: n=1,642

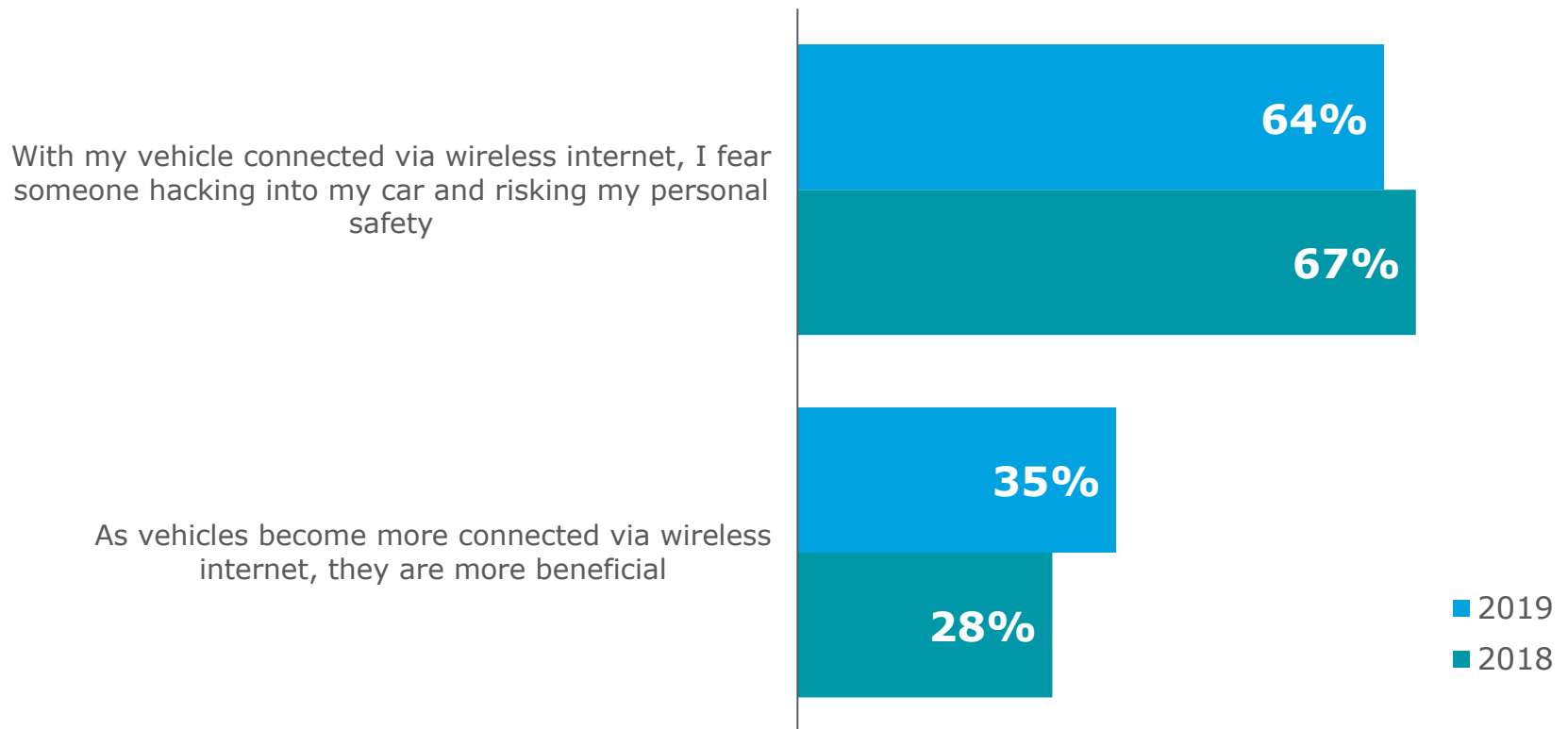
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**What do consumers
think about connected
vehicles?**

Consumers slightly less concerned with vehicle hacking YoY

Percentage of people that think more connectivity means more benefit is also directionally positive on a year-over-year basis

Percentage of consumers who agree that...



Note: Percentage of respondents who strongly agreed or agreed have been added together

Q3. To what extent do you agree with the following statements regarding future vehicle technology?

Sample size: n= 1,684

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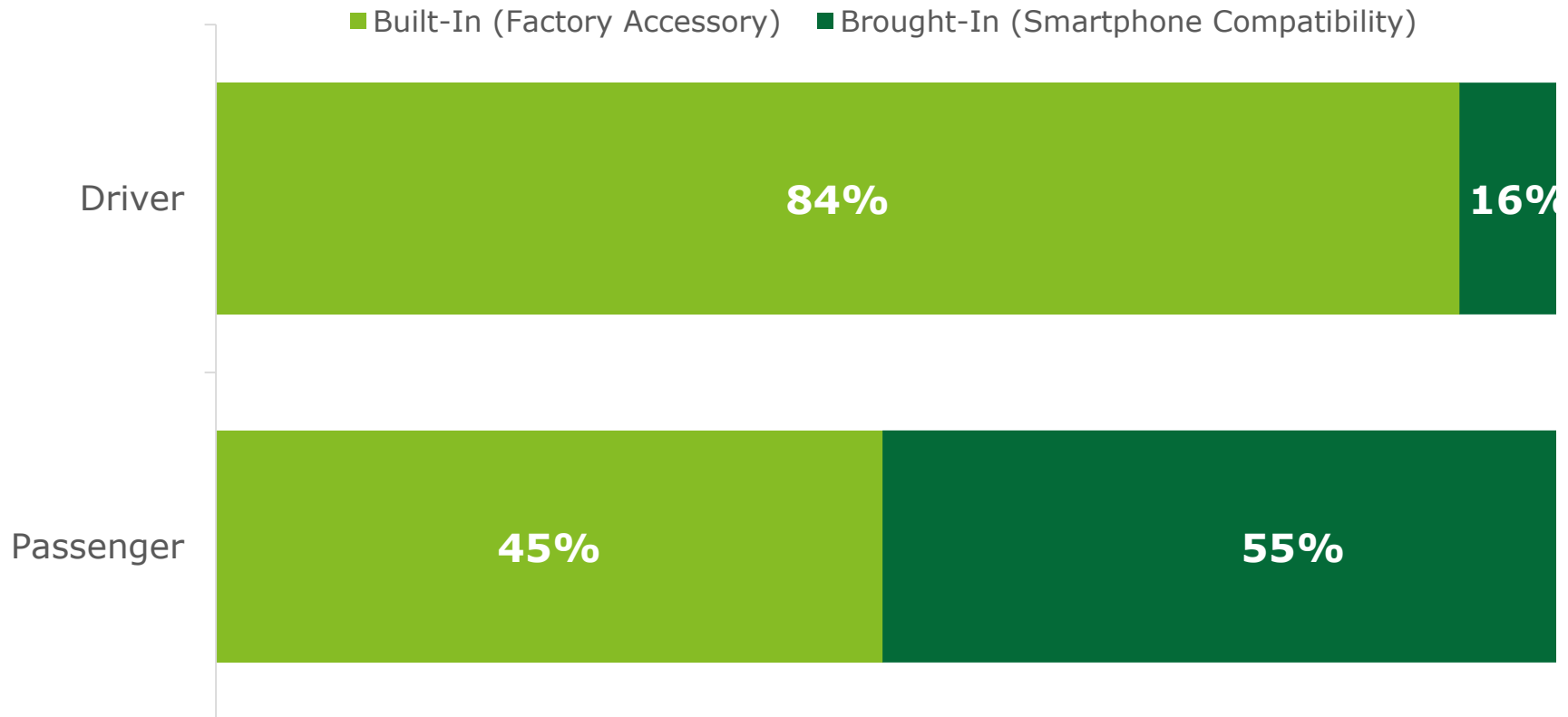
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Strong majority of drivers prefer “built-in” technology

Although drivers have a clear preference, passengers prefer “brought-in” technology which may have implications on AV contenting strategies

Preferred type of technology interface by type of vehicle occupant



Q18. In general, what kind of technology interface would you prefer in your vehicle?

Sample size: n =1,207

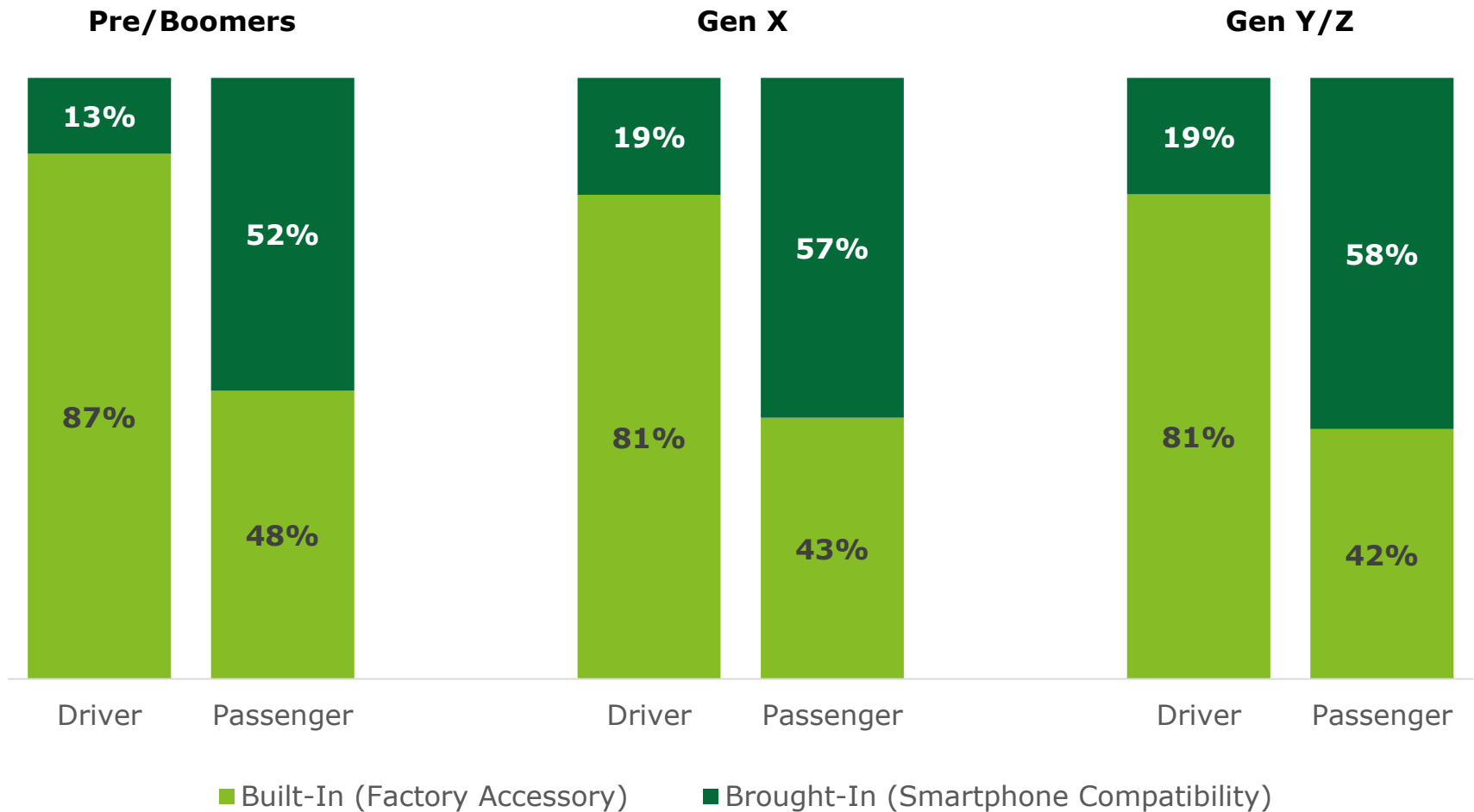
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2019 Deloitte Global Automotive Consumer Study

Across generations, drivers prefer 'built-in' technology

However, passengers prefer to have brought-in capabilities



Q18. In general, what kind of technology interface would you prefer in your vehicle?

Sample sizes - [Pre/boomers, N= 538; Gen X, N= 267; Gen Y/Z, N= 402]

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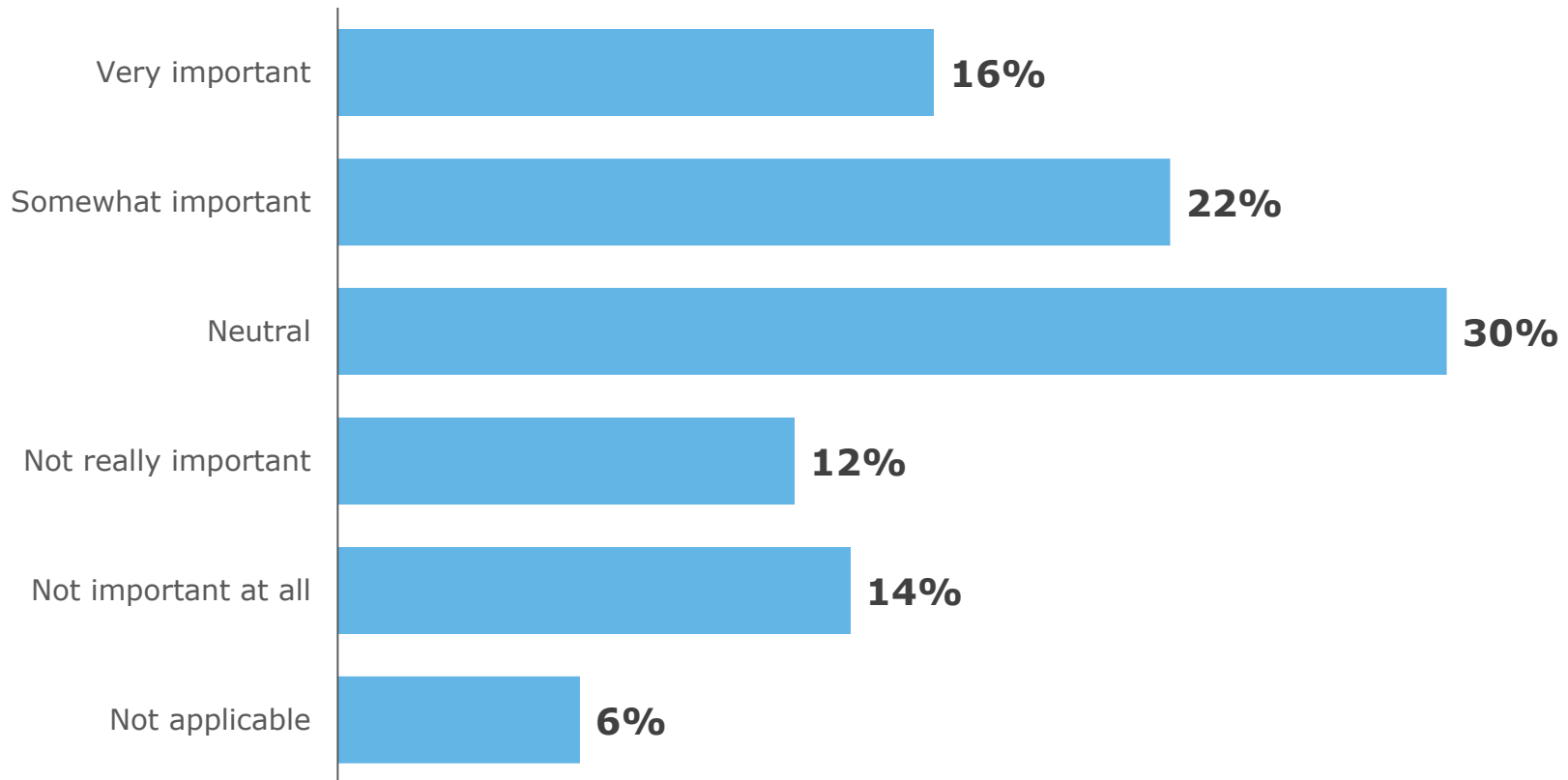
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Having the same interface across multiple vehicles is important

38% of consumers think it is at least somewhat important to have the same technology interface across multiple vehicles

How important is having the same technology interface across multiple vehicles?



Q19. How important is it to have the same technology interface across multiple vehicles in your household?

Sample size: n=1,207

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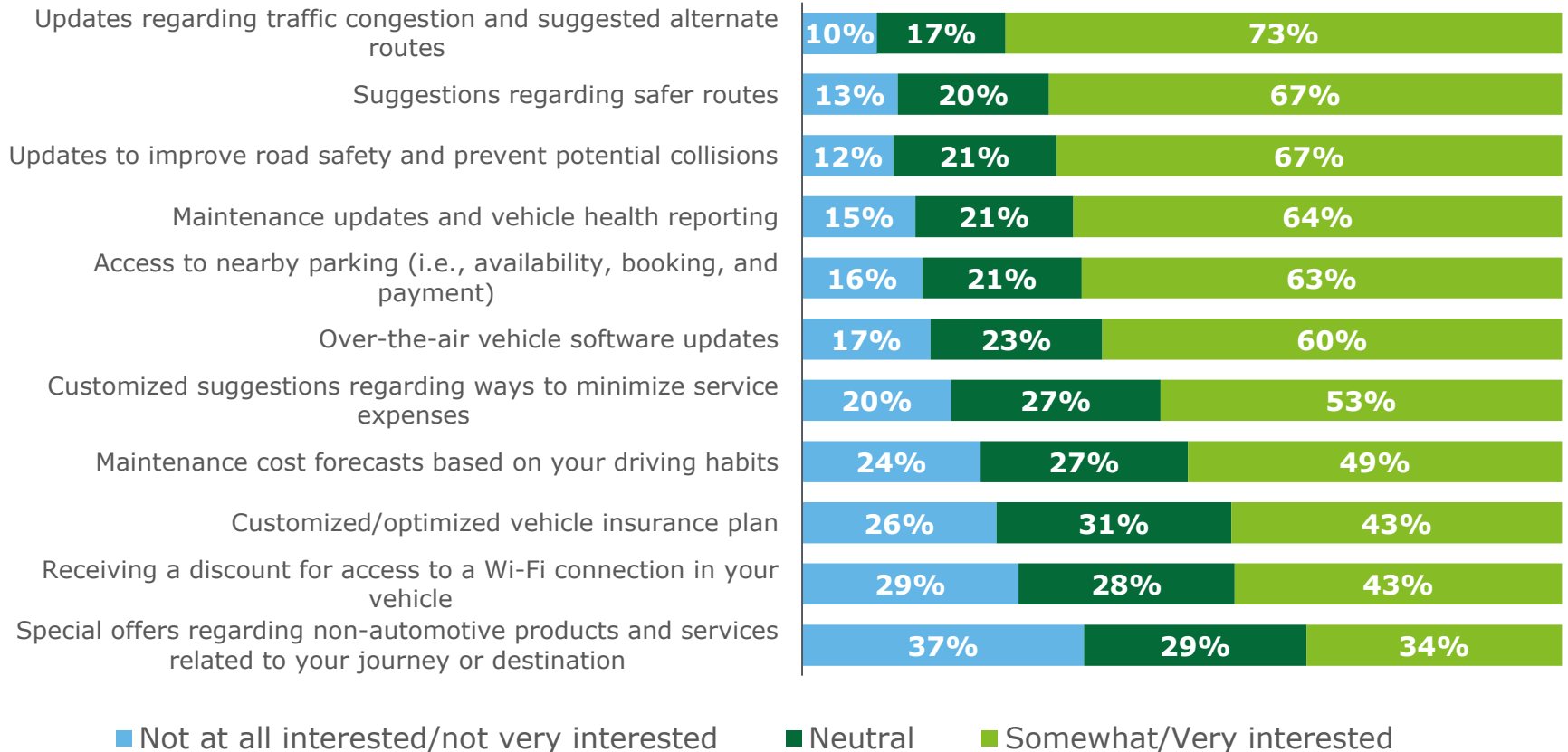
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Consumers are most interested in traffic updates

More than two-thirds of consumers are interested in benefits such as traffic updates, safer travel routes, and collisions detection

Consumer opinions on benefits of connected vehicles



Note: Percentage of respondents who are somewhat or very interested have been added together

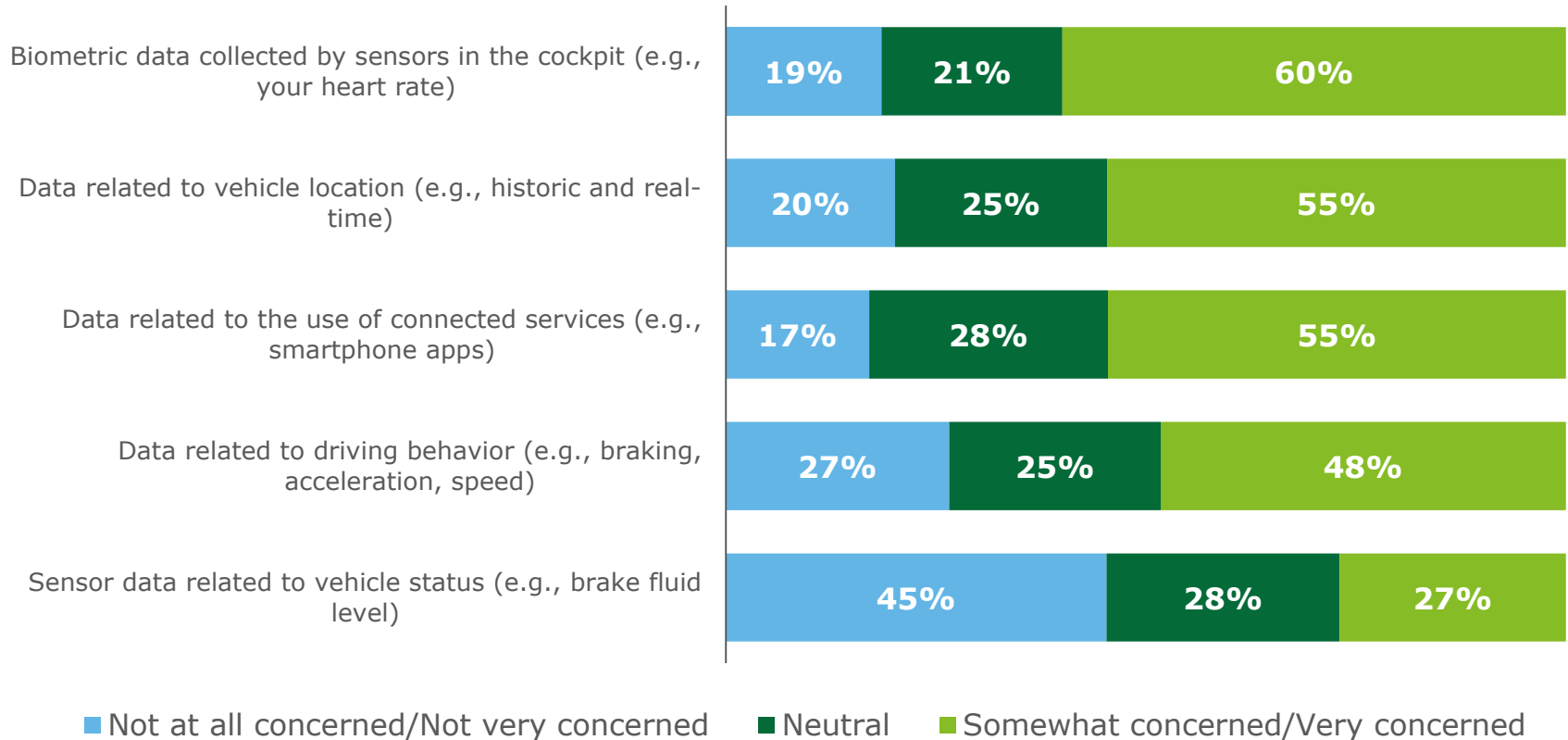
Q21: How interested are you in the following benefits of a connected vehicle if it meant sharing either your own personal data or the data generated by the operation of your vehicle?

Sample size: n=1,207

Consumers concerned if personal data is collected by the car

More than half of consumers are concerned if data related to biometrics, apps, and vehicle location is collected and shared

Consumer opinions on futuristic scenarios



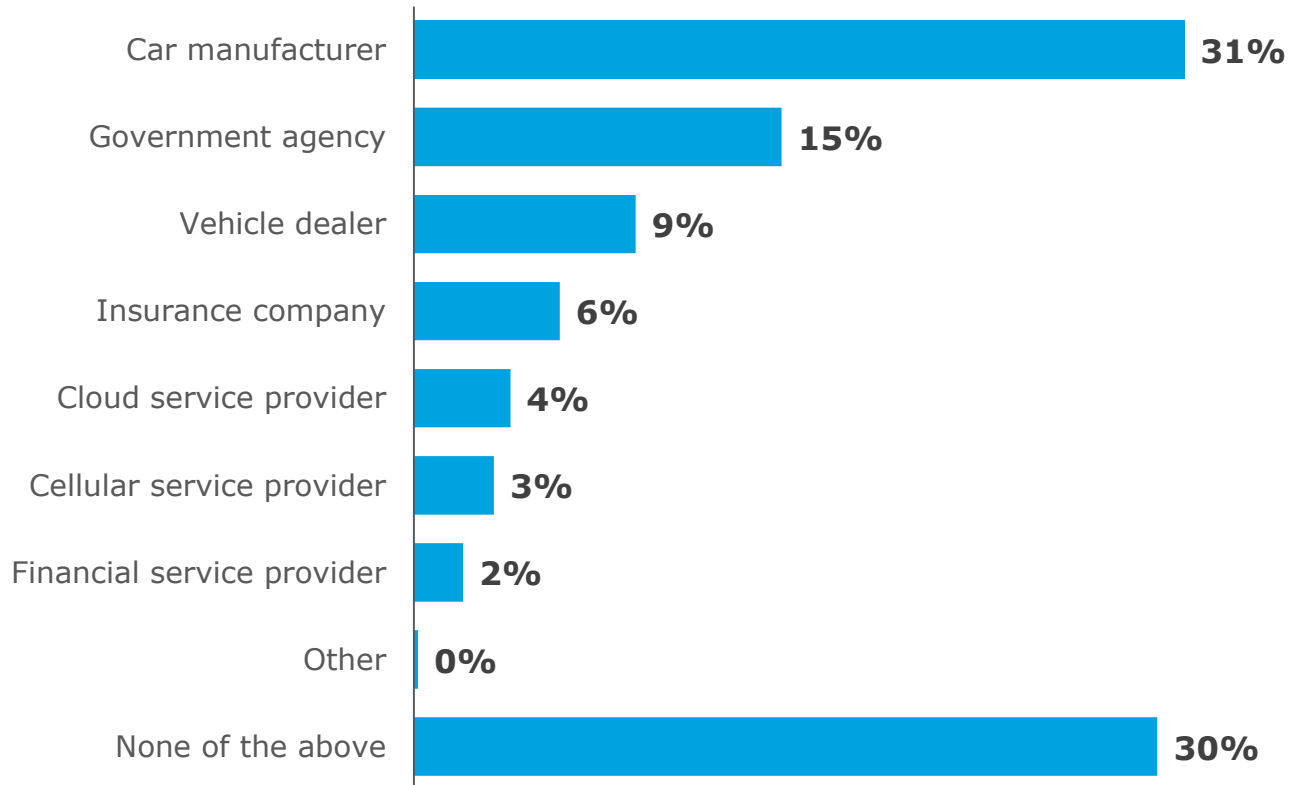
Q22. As vehicles become more and more connected to the internet, how concerned would you be if the following types of data were shared with your vehicle manufacturer, dealer, insurance company and/or other third parties?

Sample size: n=1,207

Consumers trust OEMs the most in managing collected data

At the same time, 30% percent of consumers said they do not trust anyone in managing the data that is generated in a connected vehicle

Consumer opinions on whom they trust the most to manage data generated/collected by their vehicle



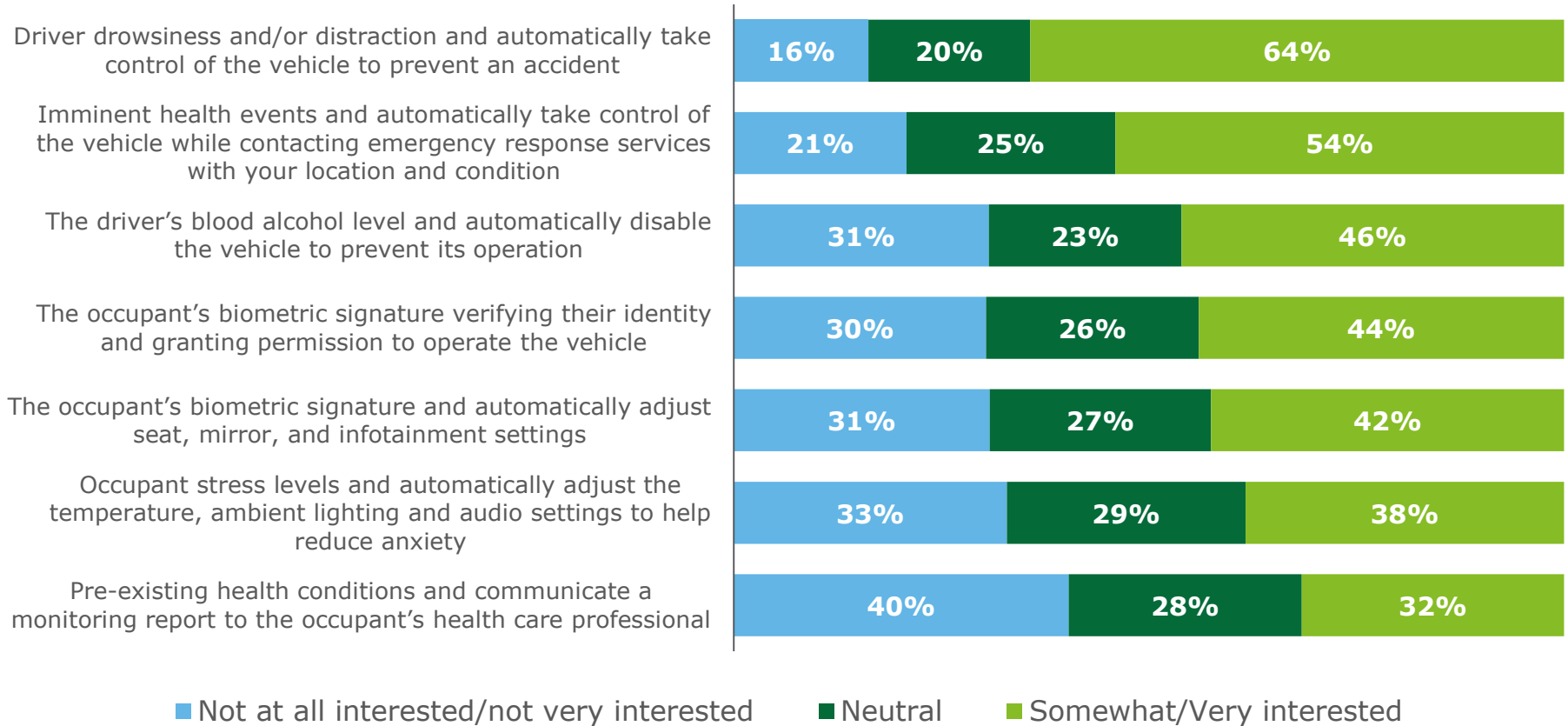
Q23. In a scenario where you owned a connected vehicle, which of the following entities would you trust the most to manage the data being generated and shared?

Sample size: n=1,207

Consumers fine to handover vehicle control in some situations

Consumers are fine with a vehicle automatically taking control in case of driver drowsiness/distractions, poor health, and high alcohol level

Consumer opinions on benefits of connected vehicles



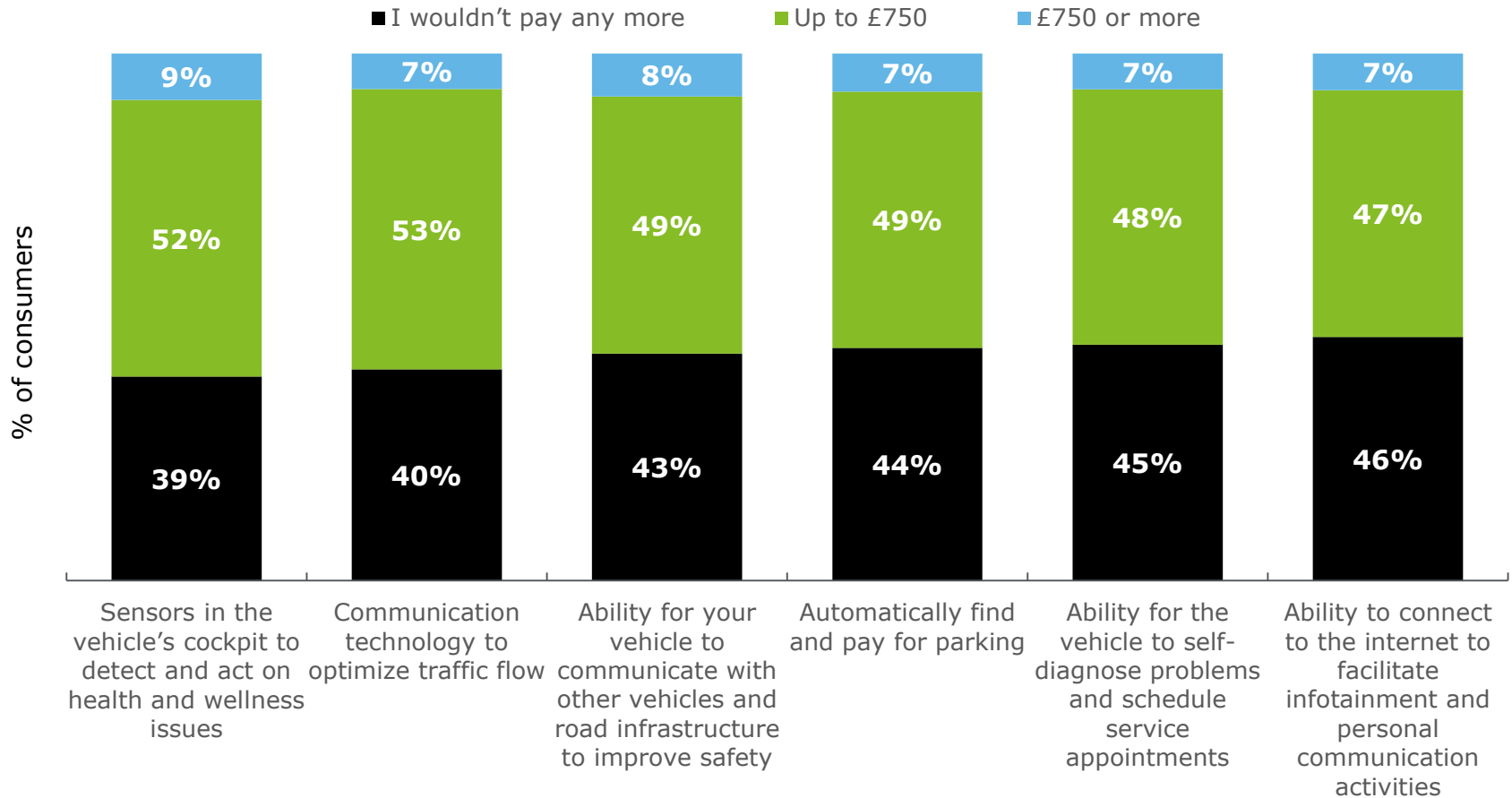
Q24: As vehicle interiors are equipped with more connected sensors and/or autonomous driving technology, how interested are you in each of the following?

Sample size: n=1,207

Majority of consumers willing to pay for connected technologies

But, there is a significant number of people that indicate they will not pay any more to gain access to advanced connectivity features

Consumers' willingness to pay for various connected technologies



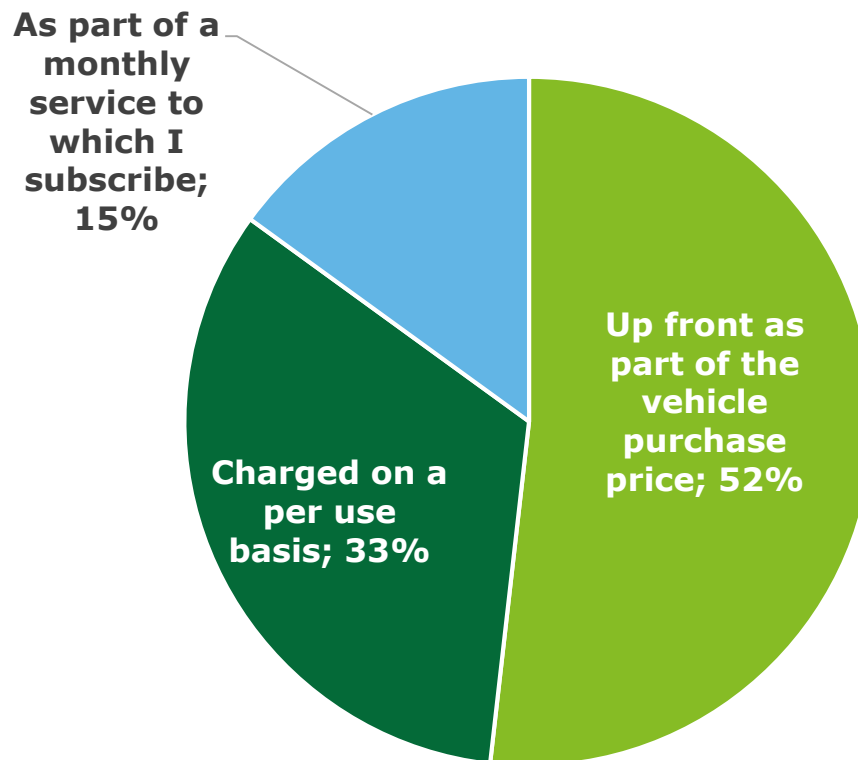
Q25: How much more would you be willing to pay for a vehicle that had the following connectivity technologies?

Sample size: n=1,207

Vehicle buyers prefer to pay for added tech features up front

52% of consumers are ready to make an upfront payment for connectivity technologies

How would consumers prefer to pay for additional connectivity technologies?



Q25a: How would you most prefer to pay for additional connectivity technologies?

Sample size: n= 886

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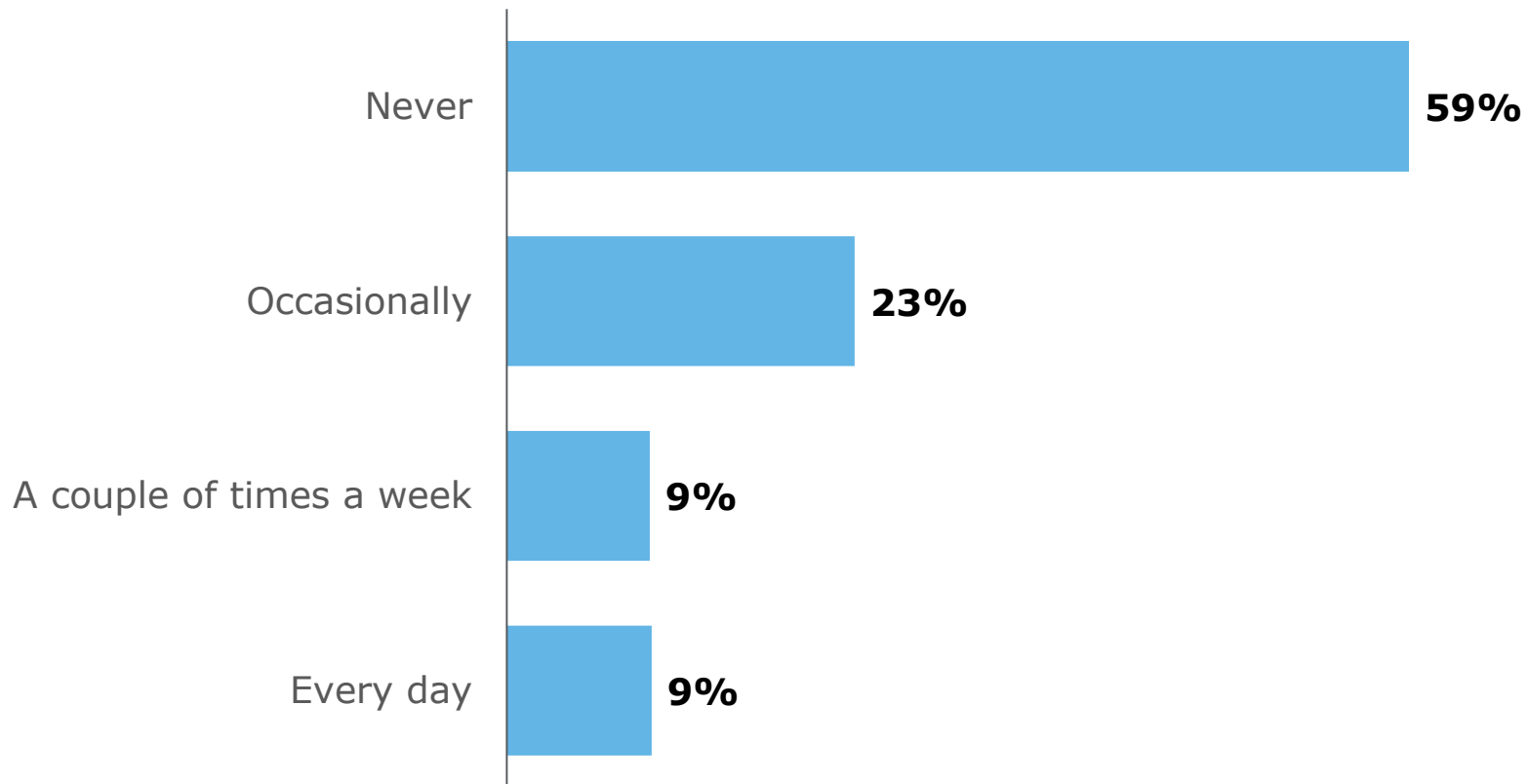
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**What do consumers
think about multi-
modal mobility?**

Majority of people are still not able to telecommute...

An effective, efficient transportation system remains a vital part of everyday life for most people

How often do consumers work from home?



Q34: How often do you work from home?

Sample size: n= 1,773

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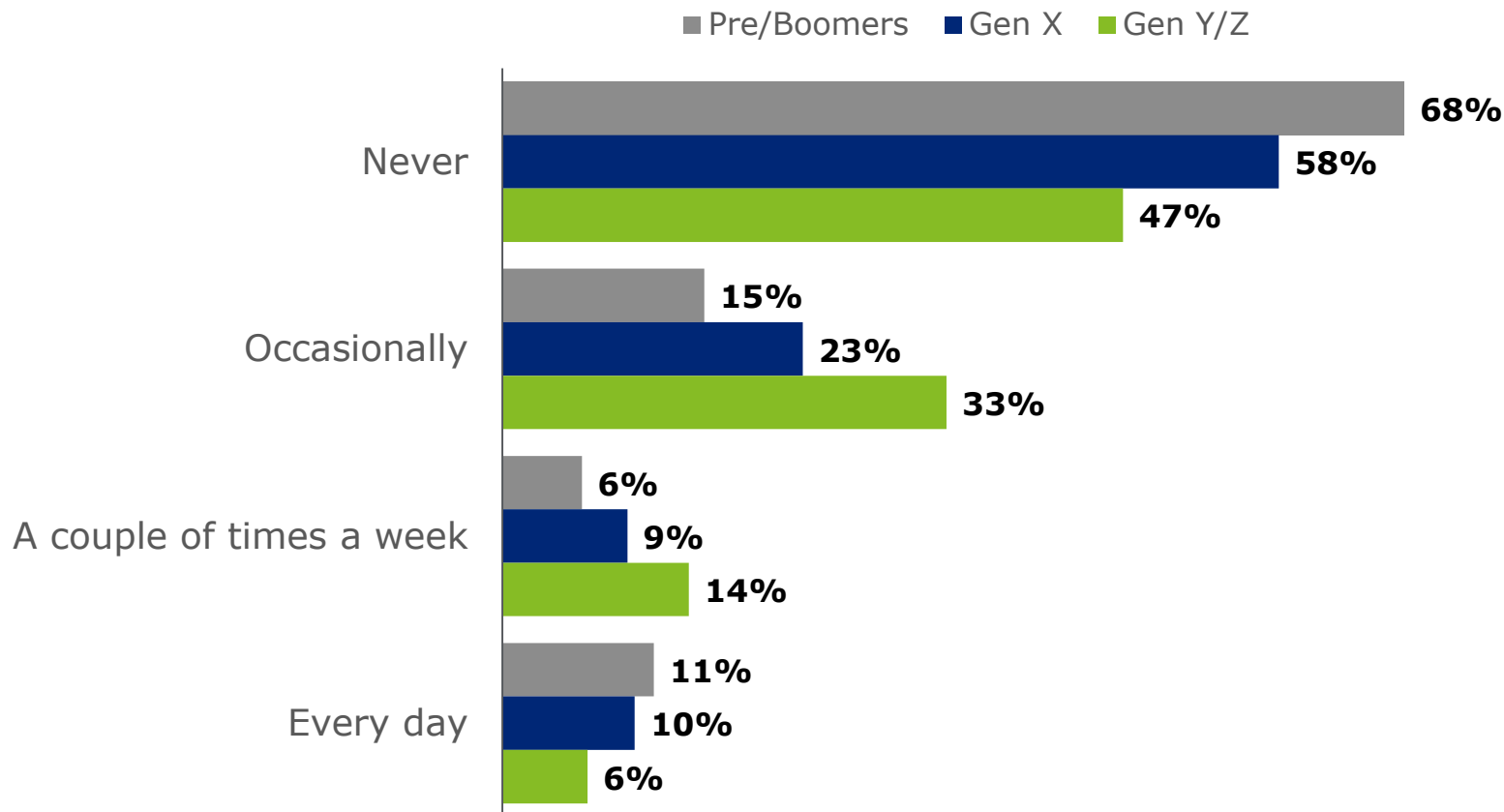
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...but, younger consumers may be starting to buck the trend

Perhaps an early sign that transportation systems may need to adapt to changing work habits going forward

How often do consumers work from home?



Q34: How often do you work from home?

Sample sizes - [Pre/boomers, N= 820; Gen X, N= 373; Gen Y/Z, N= 580]

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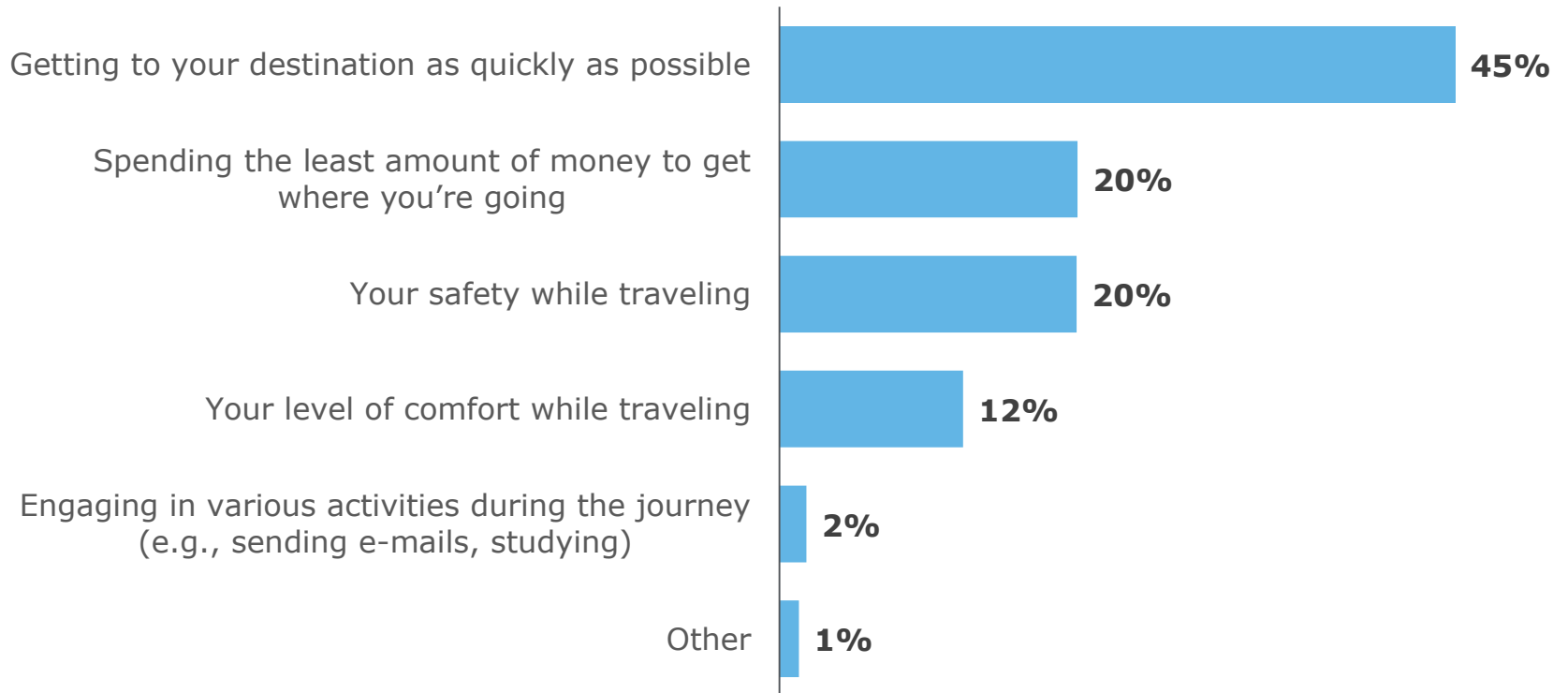
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Minimum travel time is the most important aspect of mobility

Apart from reaching a destination quickly, consumers also consider safety and least expensive travel option to be an important aspect

What is the most important aspect of mobility?



Q35: What is the most important aspect of mobility?

Sample size: n= 1,773

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Traditional transportation types still the most preferred

Consumers prefer to walk, use their own vehicle, or bicycle (including urban bike sharing program) to satisfy their transportation needs

Frequency of transportation use by type

	Daily	Weekly	Monthly	Occasionally	Never
My Own Vehicle (4-wheeler)	47%	26%	3%	4%	20%
Car Share	1%	3%	4%	10%	82%
Ride Hail	1%	3%	4%	9%	83%
Rental Car	1%	3%	3%	30%	63%
Taxi	1%	4%	7%	53%	35%
Carpool/minibus/micro-transit	1%	4%	4%	19%	72%
Commuter train	3%	5%	6%	20%	66%
Light rail/tram	9%	16%	10%	32%	33%
Subway/metro	8%	12%	11%	29%	40%
City bus	10%	18%	11%	34%	27%
Rapid transit bus	2%	5%	6%	24%	63%
Bicycle (including urban bike sharing programs)	13%	22%	11%	17%	37%
Motorcycle/scooter/moped	2%	6%	5%	6%	81%
Water-based ferry/sea taxi	1%	2%	3%	20%	74%
Walk	61%	18%	5%	10%	6%

 Top 3 transportation types

Q26: Please select how often you currently use each transportation method.

Sample size: n=1,773

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Prevailing expectation is usage pattern will remain unchanged

New mobility models not expected to cause significant disruption over the next three years as consumers apparently satisfied with status quo

Consumer intention regarding transportation type usage in 3 years

	Daily	Weekly	Monthly	Occasionally	Never	Don't know
My Own Vehicle (4-wheeler)	46%	26%	3%	5%	13%	7%
Car Share	1%	4%	4%	12%	56%	23%
Ride Hail	1%	2%	4%	13%	59%	21%
Rental Car	1%	2%	4%	32%	42%	19%
Taxi	1%	3%	7%	52%	23%	14%
Carpool/minibus/micro-transit	1%	3%	4%	20%	51%	21%
Commuter train	3%	5%	6%	21%	47%	18%
Light rail/tram	9%	15%	9%	31%	24%	12%
Subway/metro	8%	13%	9%	28%	28%	14%
City bus	9%	17%	11%	34%	19%	10%
Rapid transit bus	2%	5%	6%	23%	42%	22%
Bicycle	16%	22%	8%	16%	26%	12%
Motorcycle/scooter/moped	2%	6%	5%	8%	56%	23%
Water-based ferry/sea taxi	1%	3%	3%	17%	51%	25%
Walk	58%	17%	5%	9%	6%	5%

 Top 3 transportation types

Q27: How often do you expect to use each of the following transportation methods in 3 years' time?

Sample size: n=1,773

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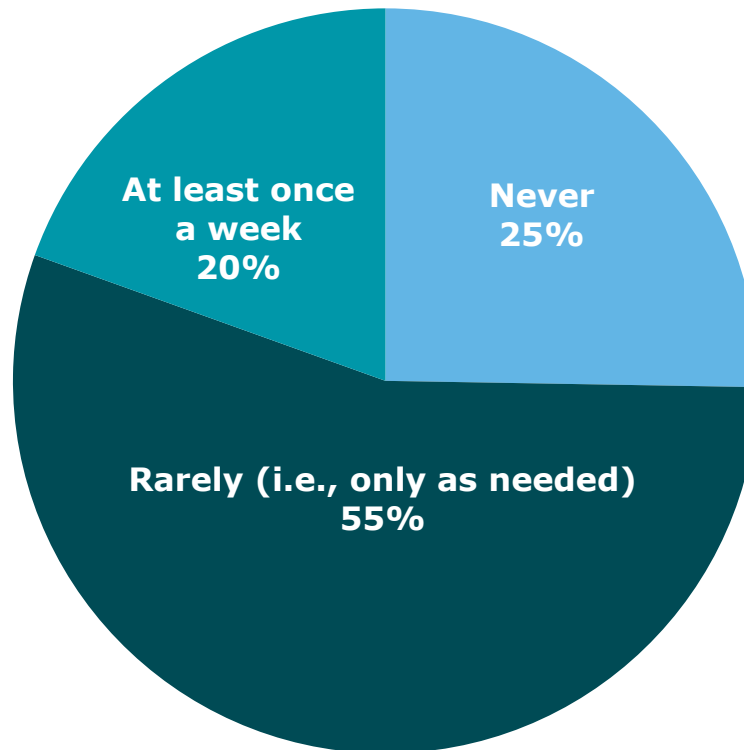
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Only 20% of people take multi-mode trips on a weekly basis

Majority of people rarely use multiple modes of transportation in the same trip – 1 in 4 consumers always use just one type per trip

% of consumers who use multiple modes of transportation in the same trip



Q29. How often do you use multiple modes of transportation in the same trip (e.g., a trip using a subway, commuter train and your own vehicle)?

Sample size: n=1,773

Personal ownership still scores high in several categories

New mobility models (e.g., car share, ride hail) face some challenges in perception of safety, ease of use, and reliability

Consumers' view regarding different transportation types

Transportation Type	Cost	Safety	Ease of use	Environmental friendliness	Reliability
My own vehicle (4-wheeler)	40.8	70.3	68.4	45.2	76.1
Car share	52.7	52.5	42.8	55.4	51.6
Ride hail	59.8	47.8	46.4	57.4	49.6
Taxi	23.3	68.4	66.4	42.5	67.7
Carpool/minibus/micro-transit	61.7	52.3	49.9	57.7	52.8
Public transportation (e.g., train, subway, bus)	50.8	67.1	60.8	67.1	55.5

Q28: Using each of the following sliding scales, please indicate how you would describe the following transportation types

Sample size: n=1,773

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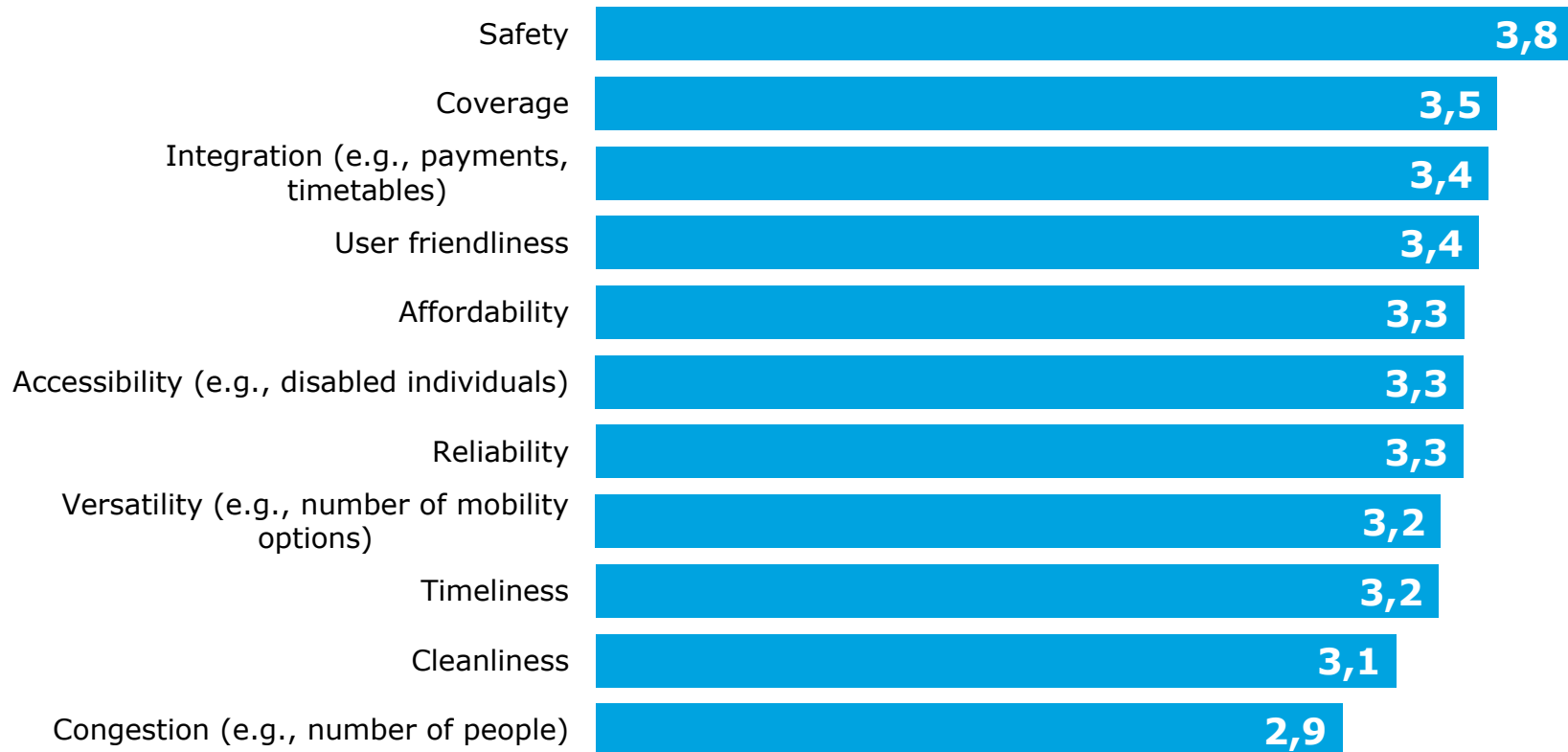
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Public transportation scores the highest on safety

However, it lags on other critical dimensions of transportation, particularly cleanliness and congestion

Consumers rating of public/mass transit system on a scale of 1-5



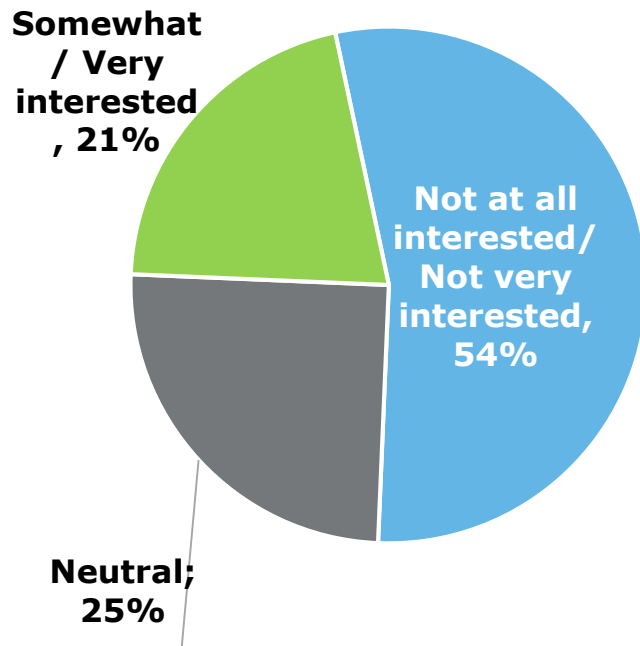
Q31: On a scale of 1 to 5 where 1 is very poor and 5 is outstanding, please rate the public/mass transit system (e.g., subways, buses, etc.) where you live in each of the following dimensions.

Sample size: n=1,773

Majority of consumers are not interested in car-pooling services

Consumers are not interested in these services as they are concerned about sharing a small space with strangers

Percentage of consumers interested in using a car-pooling service

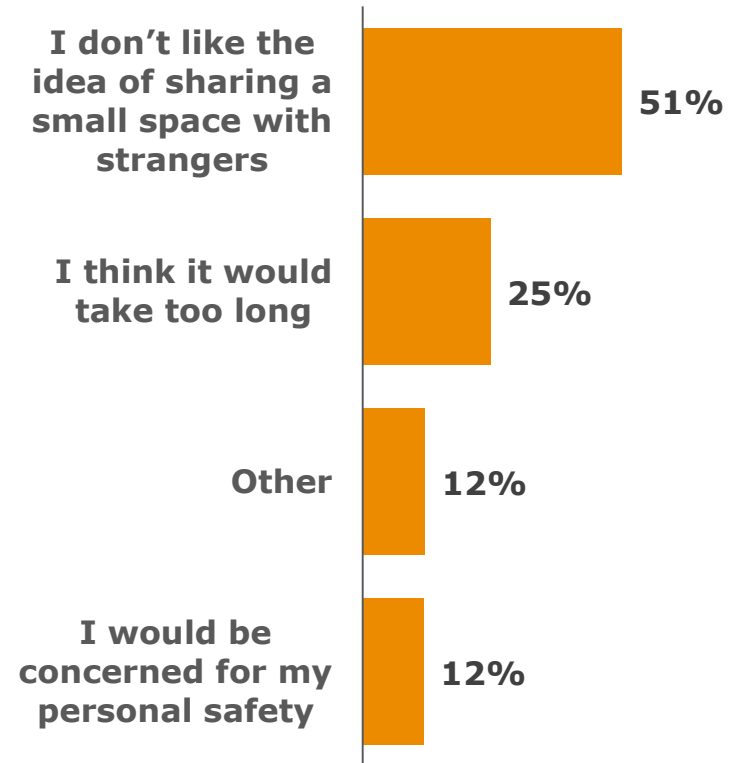


Q30. To what extent are you interested in using a car-pooling service (e.g., minibus or micro-transit service) in which multiple passengers travel to different destinations in the same vehicle?

Sample size: n=1,773

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Main reason consumers' are not interested in using a car-pooling service



Q30a. What is the main reason you are not interested in using a car-pooling service (e.g., minibus, micro-transit) in which multiple passengers travel to different destinations in the same vehicle?

Sample size: n=964

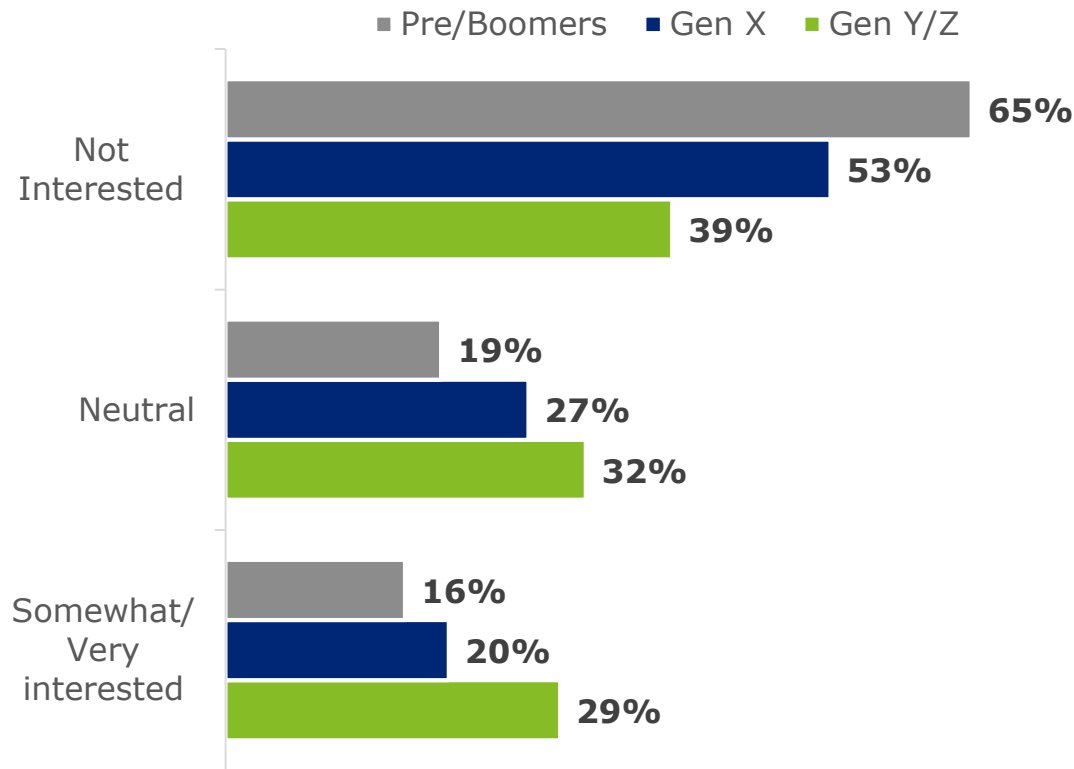
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Interest in car-pooling services varies among generations

Though younger consumers are relatively more interested than older generations, overall acceptance remains fairly low

Percentage of consumers interested in using a car-pooling service



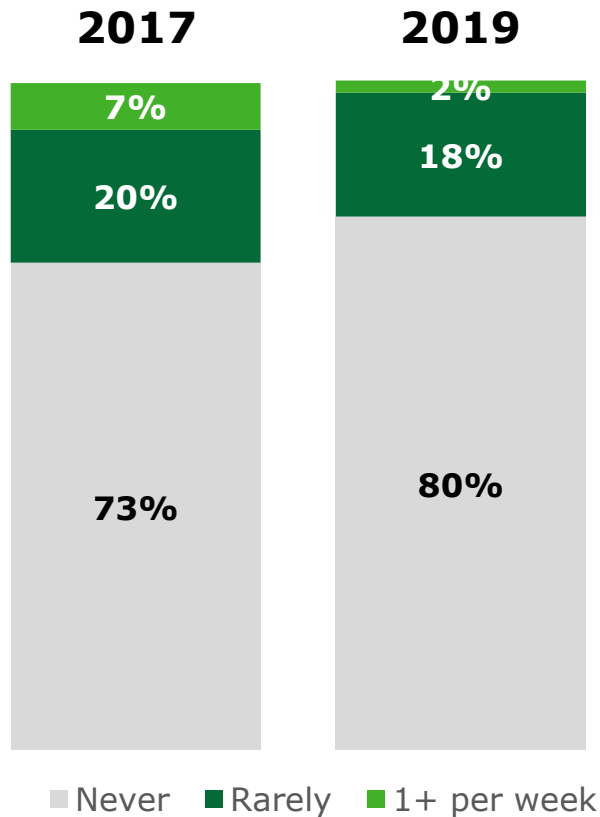
Q30. To what extent are you interested in using a car-pooling service (e.g., minibus or micro-transit service) in which multiple passengers travel to different destinations in the same vehicle?

Sample sizes - [Pre/boomers, N= 820; Gen X, N= 373; Gen Y/Z, N= 580]

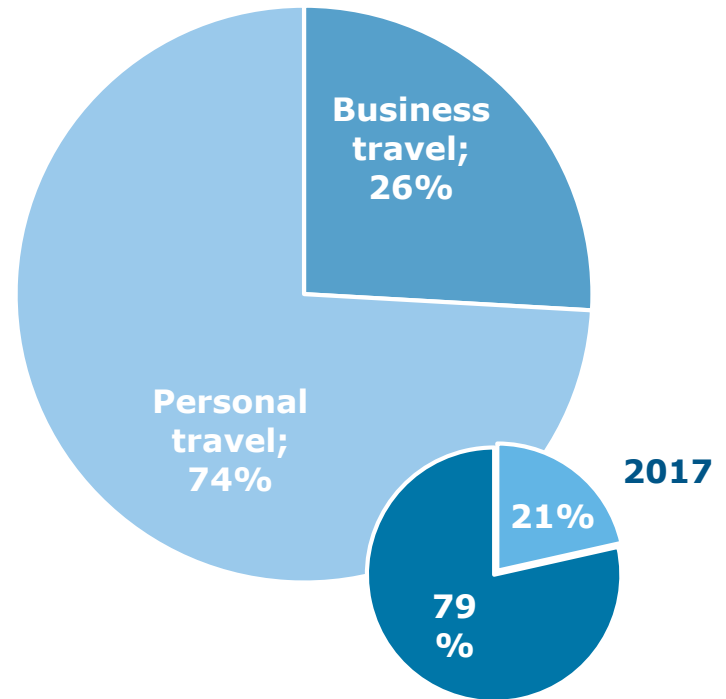
Percent of people using ride-hail regularly has dropped

Also, there has been a significant decrease in the number of people who use the service on an occasional basis

Frequency of ride-hailing usage



Purpose of ride-hailing (2019)



Q36. How often do you currently use ride-hailing services?

Sample size: n=1,773

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Q36a. What percent of your ride-hailing trips are for business versus personal reasons?

Sample size: n=360

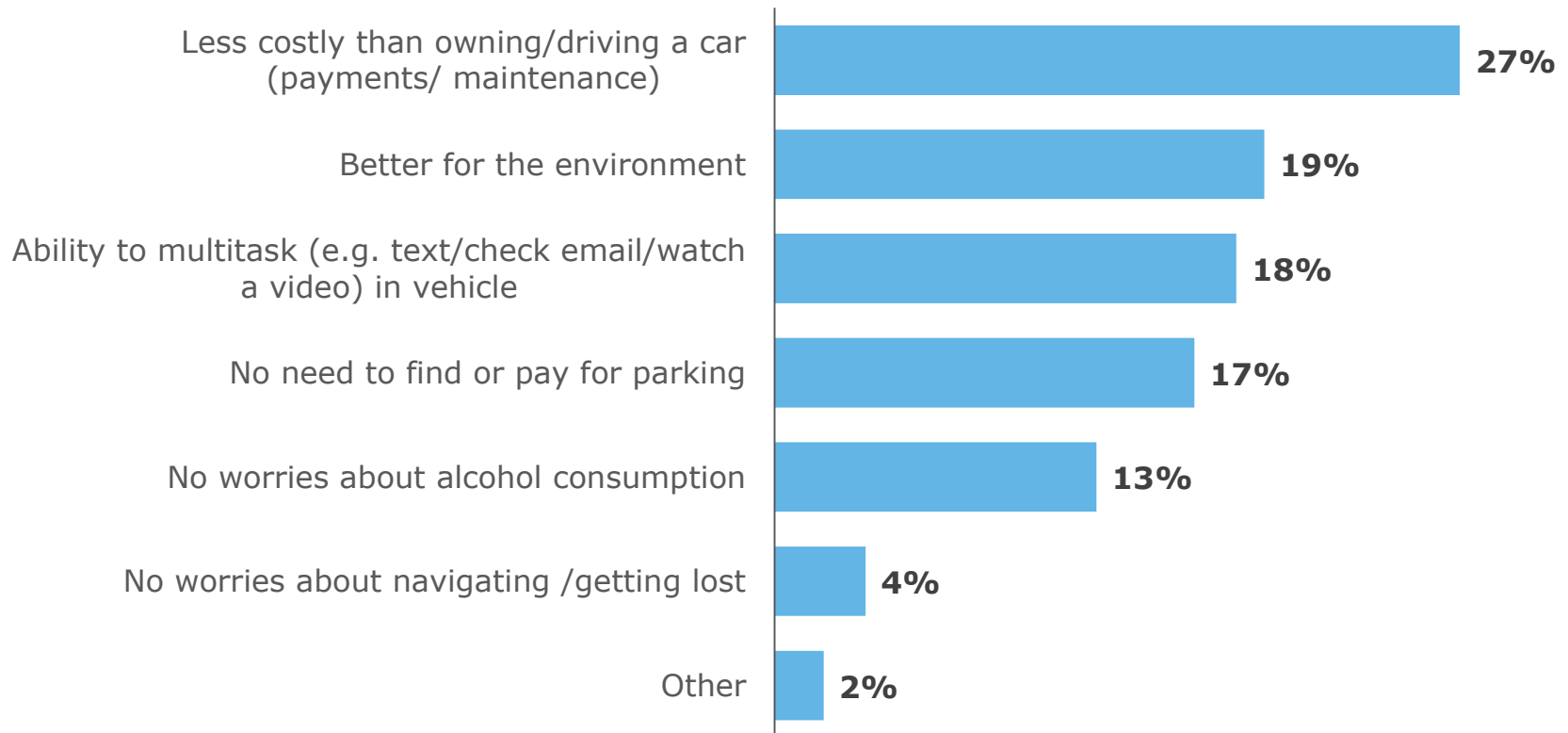
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Consumers see multiple benefits of ride-hailing services

Lower overall cost than owning a car and good for environment are seen as the most important benefits

Most important benefit of using a ride-hailing service



Q36b: What is the most important benefit of using a ride-hailing service?

Sample size: n= 360

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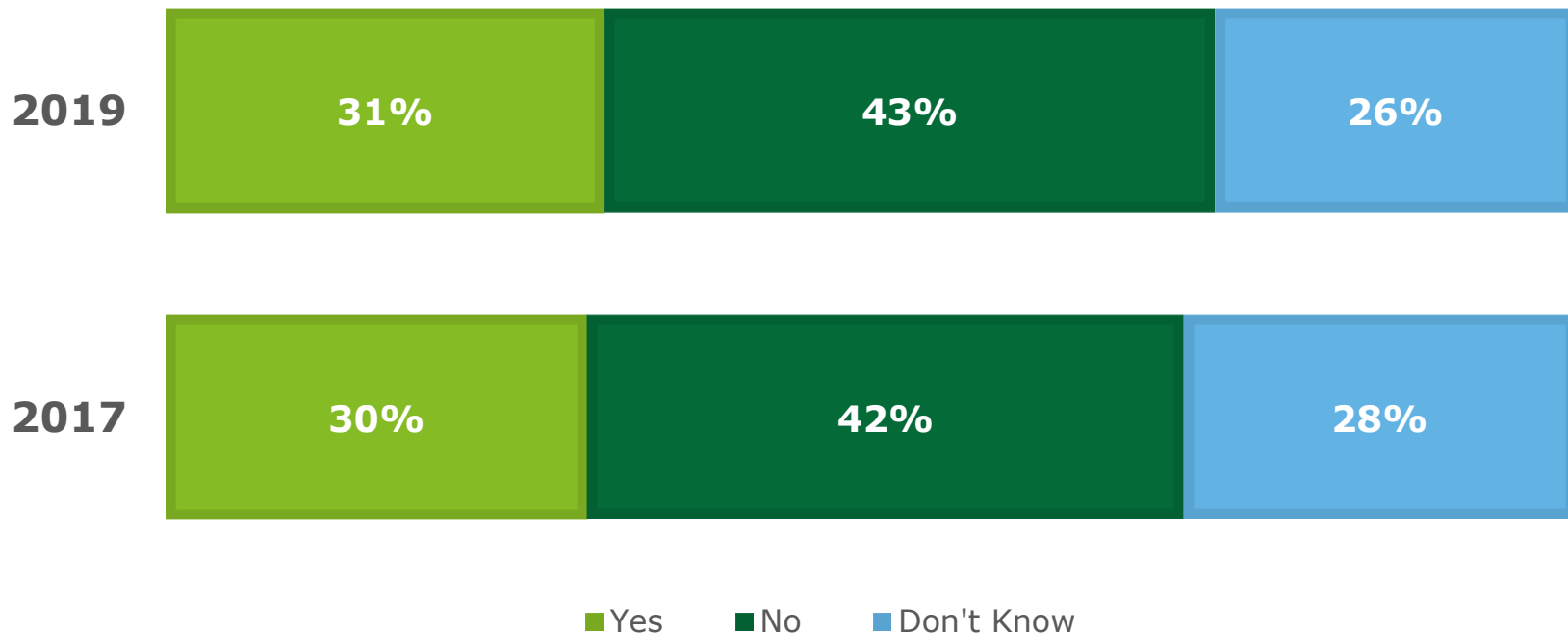
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2019 Deloitte Global Automotive Consumer Study

A third of consumers may give up vehicle ownership

It has remained constant since 2017 when 30% of consumers wondered whether they need to own a vehicle going forward

Percentage of consumers who question the need to own a vehicle in the future due to use of ride-hailing services



Q36c. Does your use of ride-hailing services make you question whether you need to own a vehicle going forward?

Sample size: n=360

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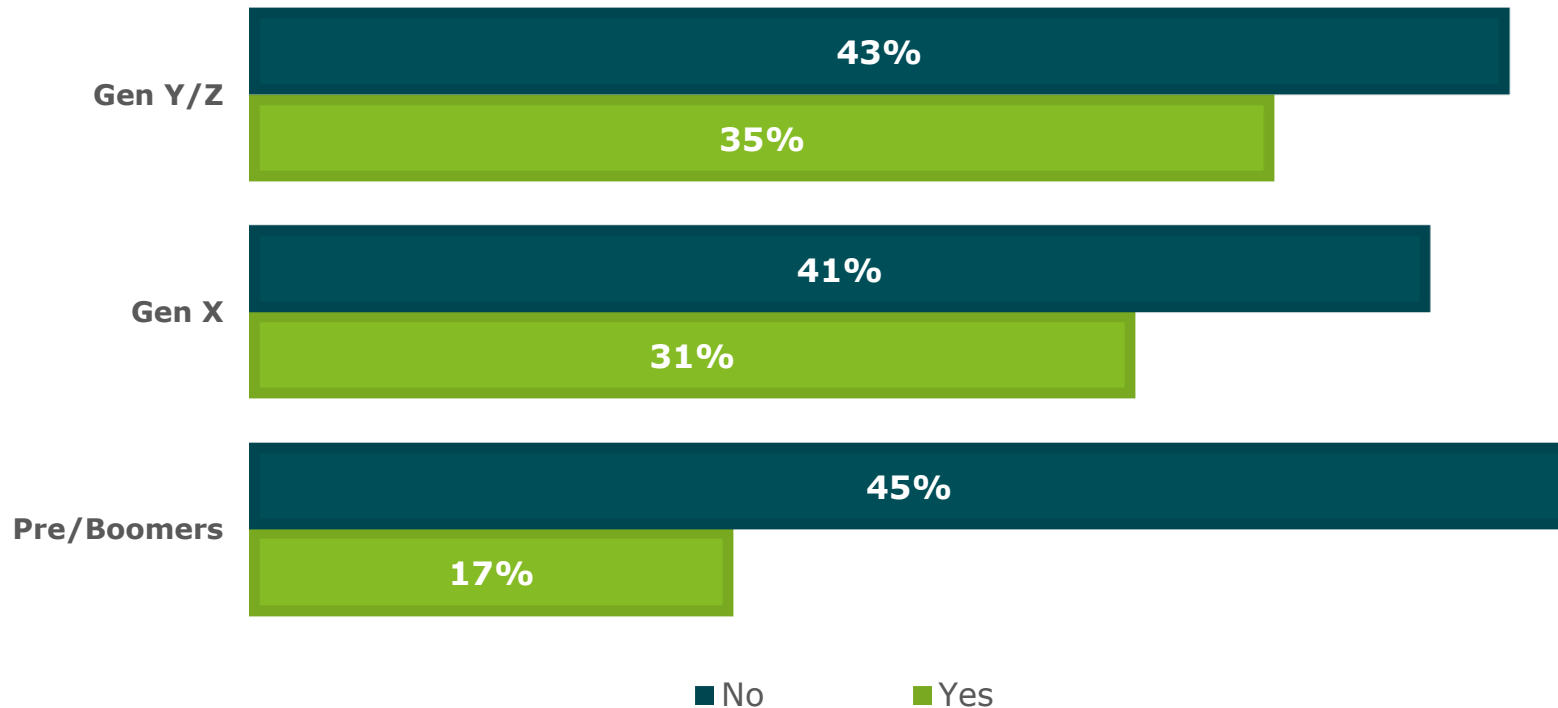
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2019 Deloitte Global Automotive Consumer Study

Younger consumers split on car ownership going forward

But, they are more willing to entertain the idea of leaving car ownership behind when compared to their older counterparts

Percentage of consumers who question the need to own a vehicle in the future due to use of ride-hailing services

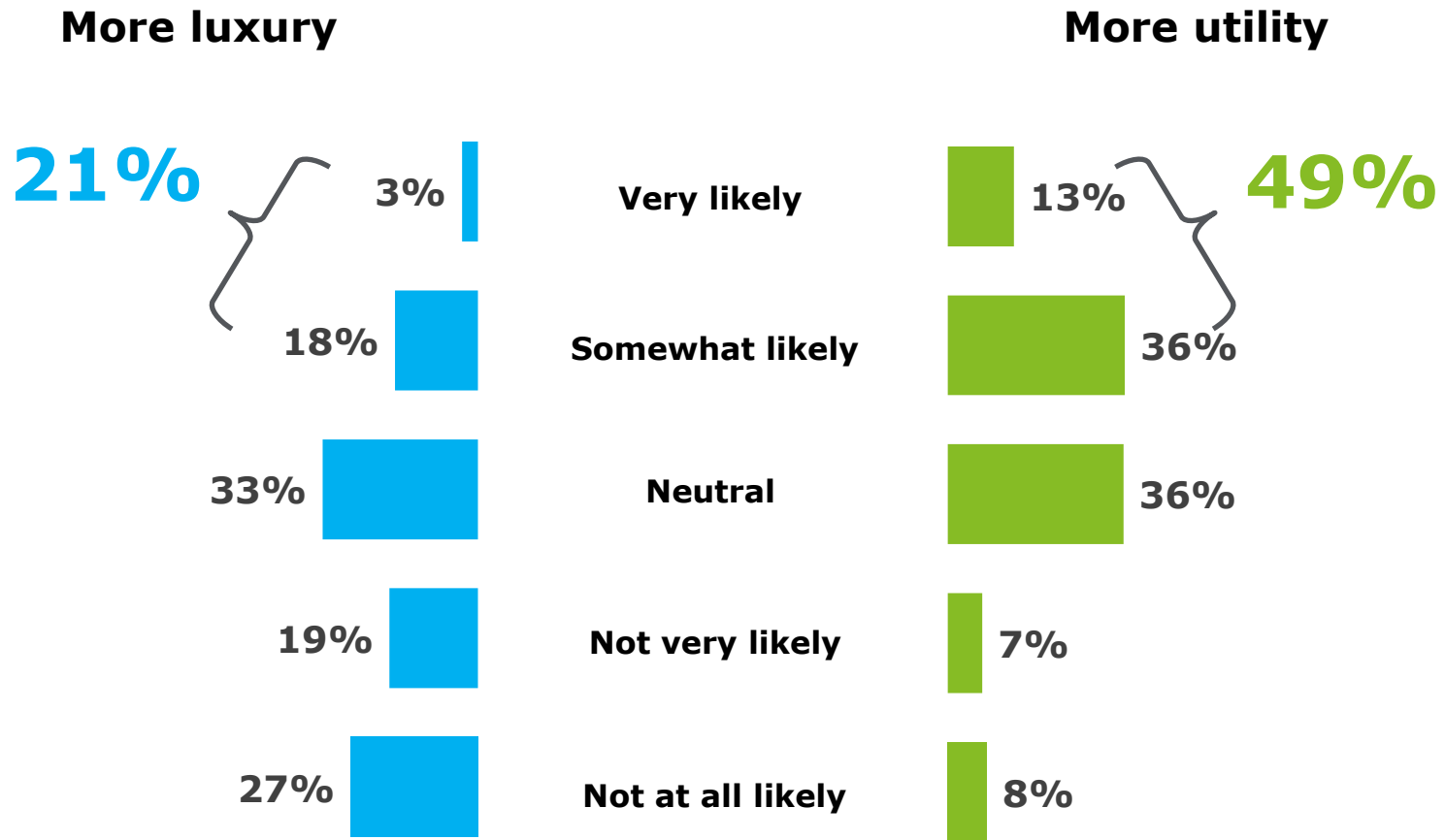


Q36c. Does your use of ride-hailing services make you question whether you need to own a vehicle going forward?

Sample sizes - [Pre/boomers, N= 66; Gen X, N= 59; Gen Y/Z, N= 235]

People want utility vs. luxury when downsizing number of cars

49% of consumers said they would consider a model that offers more utility compared to 21% that would likely favour more luxury



Q37. If you were to downsize the number of vehicles in your household as a result of increased mobility options, how likely would you be to consider acquiring a model that offers more luxury and/or utility as your next vehicle?

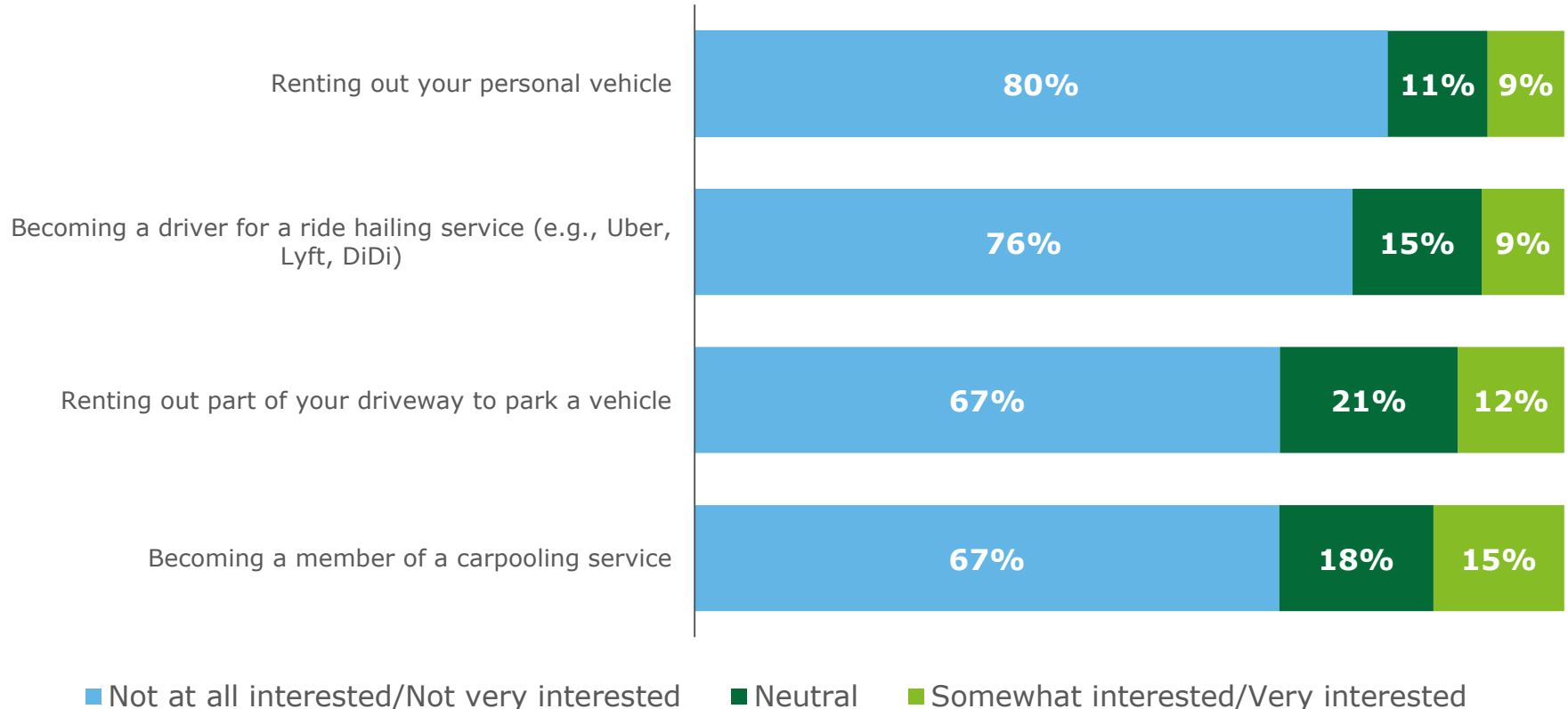
Sample size: n =1,773

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Majority of people not interested in new ways to make money

Despite being grossly underutilized, the concept of renting out a personal vehicle has yet to catch on amongst the general population

How interested are consumers in the following scenarios?



Note: Percentage of respondents who are very interested or somewhat interested have been added together

Q38. How interested are you in participating in the following activities?

Sample size: n=1,773

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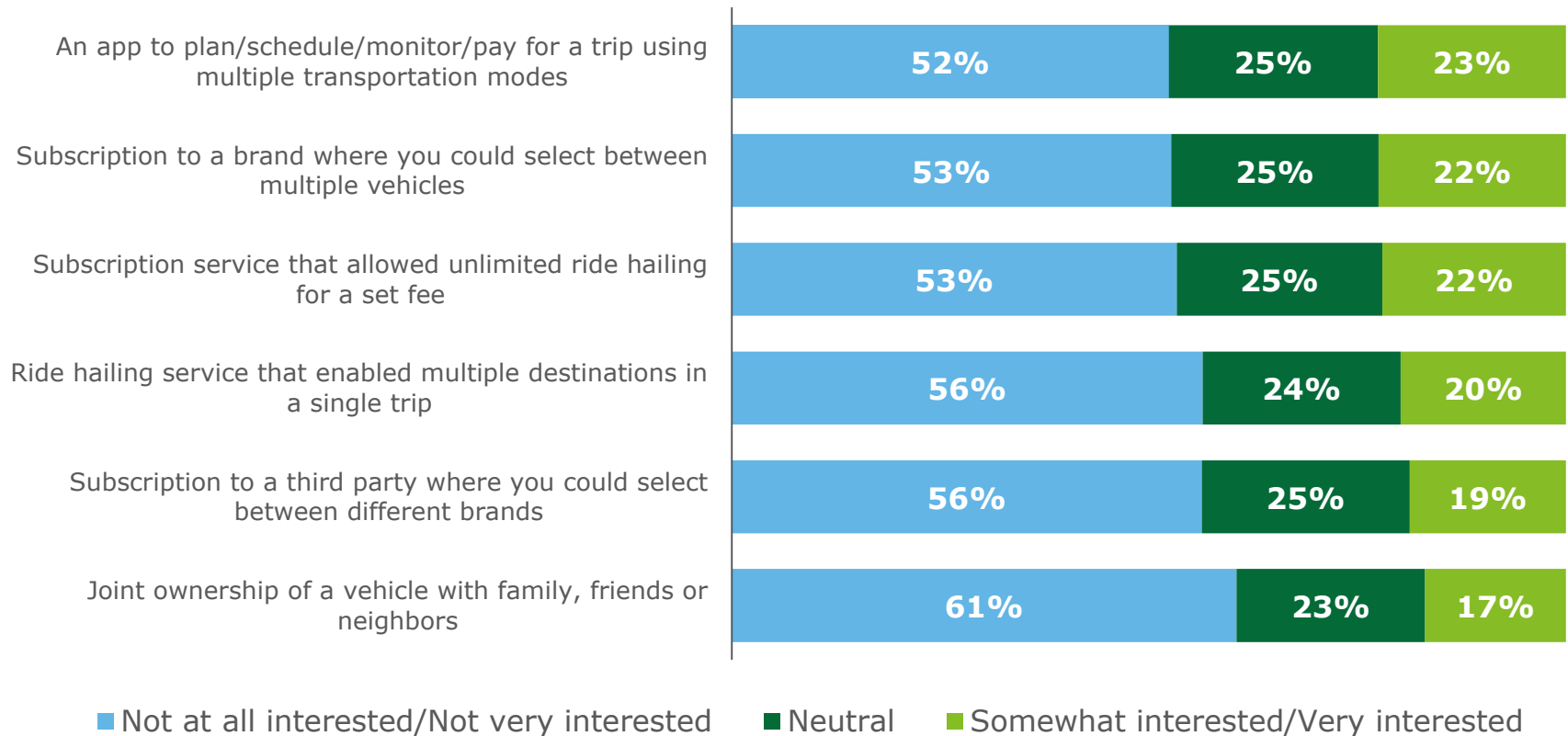
Germany

2019 Deloitte Global Automotive Consumer Study

Majority of interest lies in a fully integrated “mobility app”

However, interest in forward-looking mobility scenarios/tools is so far limited as half of consumers just don't see the need...yet

Level of interest in the following scenarios



Note: Percentage of respondents who are very interested or somewhat interested have been added together

Q39. How interested are you in each of the following scenarios?

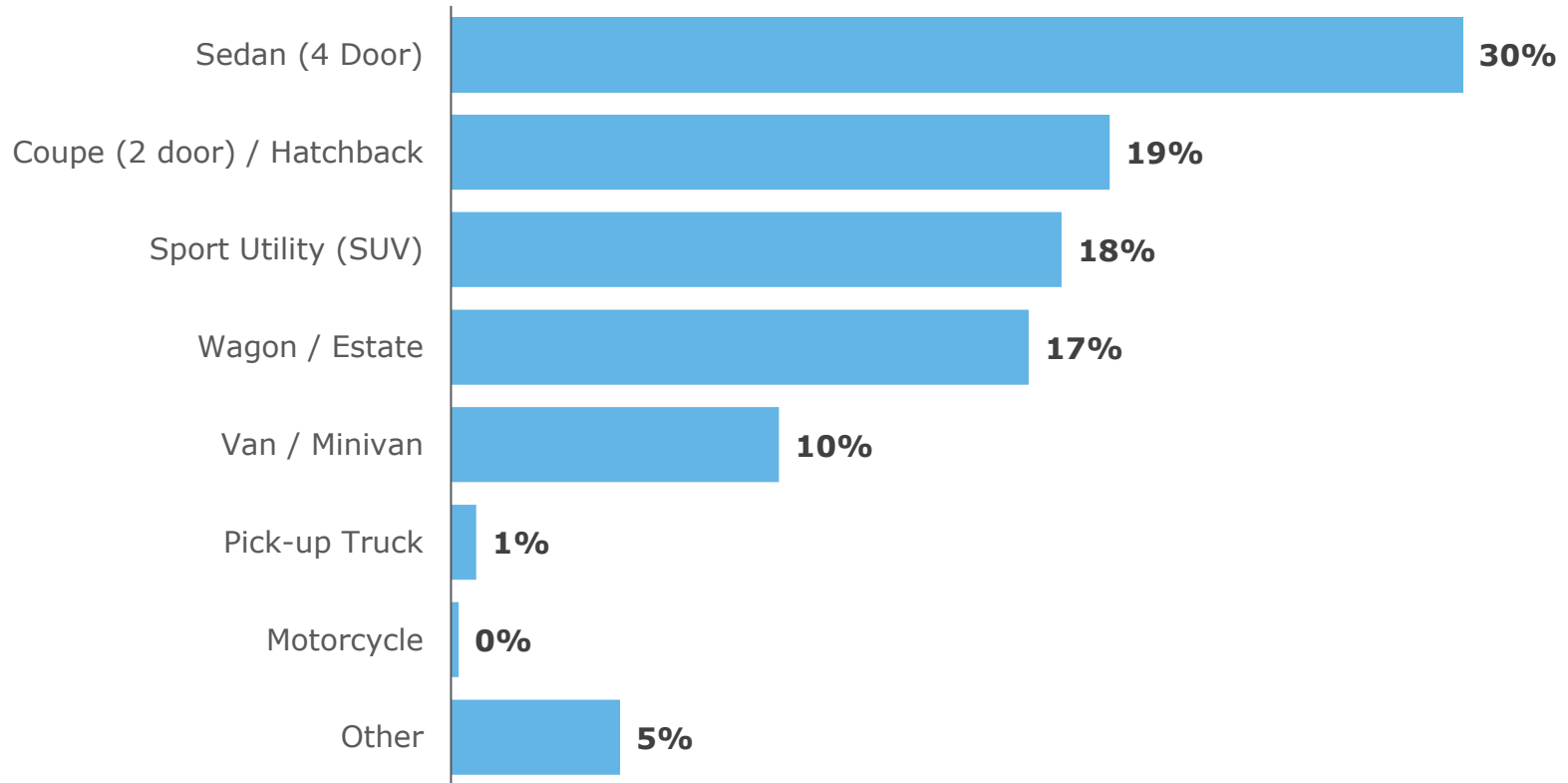
Sample size: n=1,773

**Looking forward to
a consumer's next
vehicle....**

Half of consumers still intending to buy a car (not an SUV)!

There's no doubt that more people are buying SUVs, but the demise of the passenger car may be a bit overstated

% of consumers considering a particular vehicle type



Q41. What type of vehicle are you planning to acquire next?

Sample size: n=1,343

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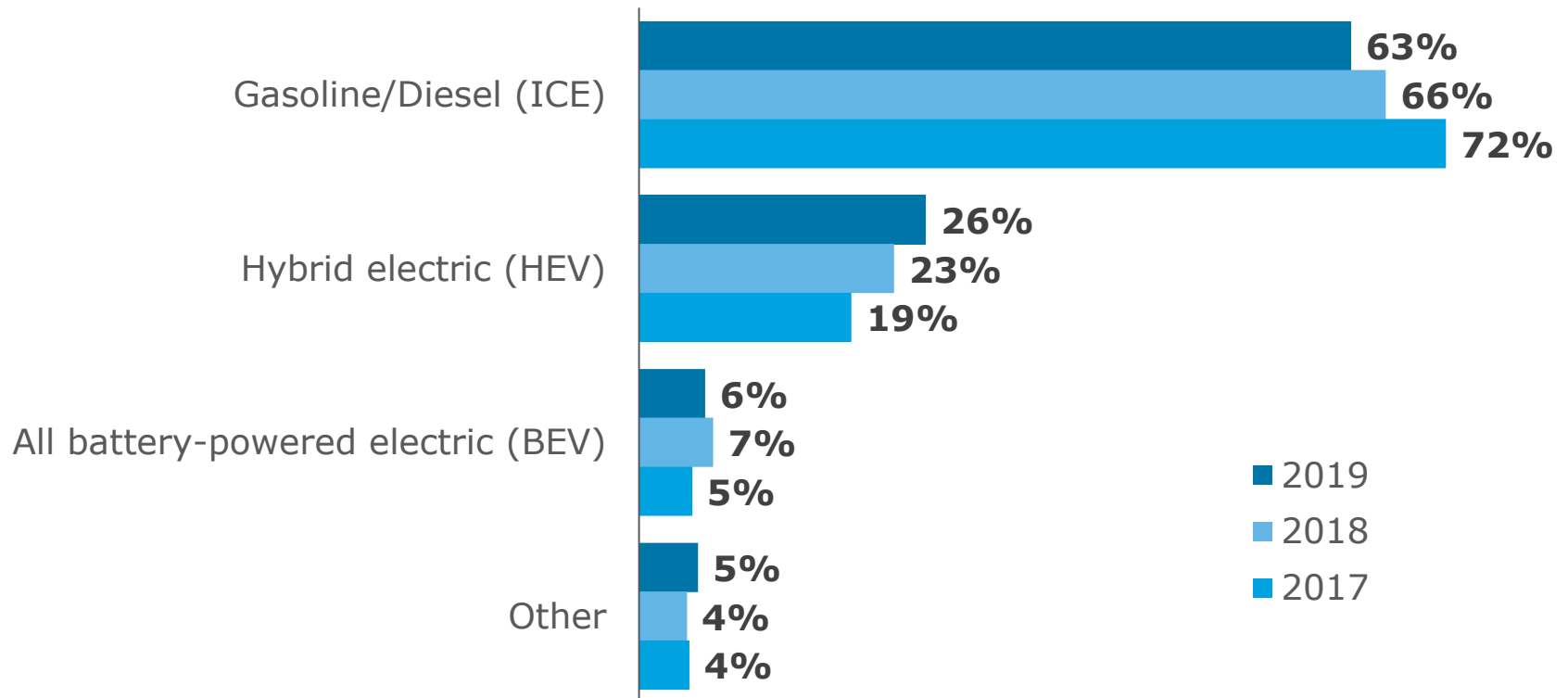
Germany

2019 Deloitte Global Automotive Consumer Study

Consumer preference for engine type is shifting

Intention to remain with traditional ICE engines is starting to give way to electric powertrain technology as interest in hybrids is growing

What type of engine do consumers want in their next vehicle?



Note: 'Other' category in 2019 data includes ethanol, CNG, and fuel cell

Q45. What type of engine would you prefer in your next vehicle?

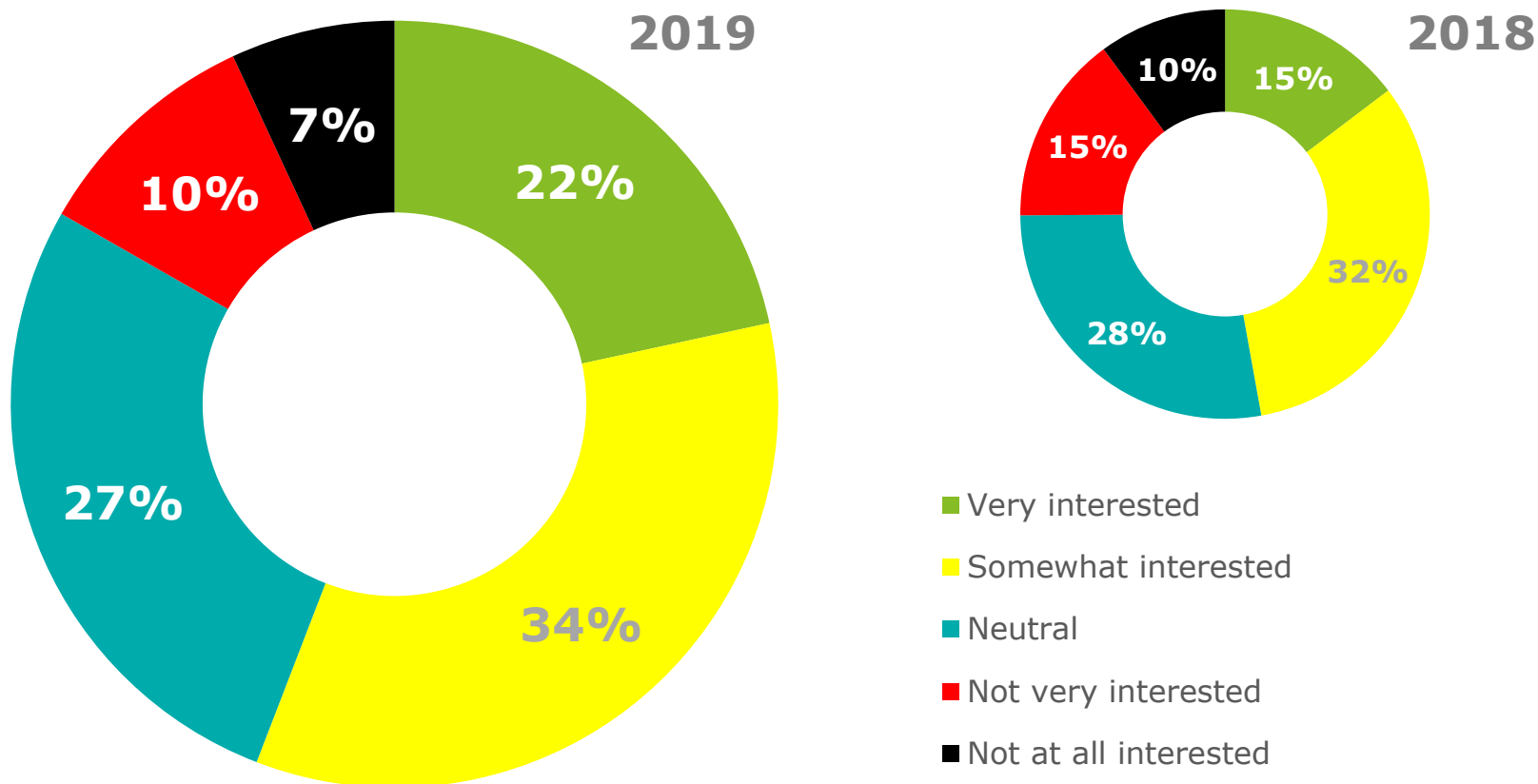
Sample size: n= 1,273 [2019], n= 1,287 [2018]

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Consumers still on the fence about buying direct from an OEM

But, there has been some movement since last year as the percentage of people that are “very interested” starts to accelerate

How interested are consumers in by-passing the dealer?



Q46. If you had the option to acquire your next vehicle directly from the manufacturer (via online process), how interested would you be?

Sample size: n=1,273



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