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**What's ahead for fully
autonomous driving**

Consumer opinions on advanced
vehicle technology

Perspectives from Deloitte's Global Automotive Consumer Study

On the road with consumers worldwide

Consumers are at the heart of the extended automotive value chain, which generates trillions of dollars for auto manufacturers, suppliers, dealers, financial institutions, oil companies and a host of other organizations.¹

Many companies that are part of this value chain are undergoing massive change in response to new technologies and new models for mobility that are coming to market at an exponentially faster pace and fundamentally transforming the movement of people and goods unlike anything seen since the dawn of the 20th century.

Consumers will ultimately choose the winners and losers among the companies and brands vying to deliver convenient, low-cost and customized mobility solutions. Consumers have the power to fall in love with innovations that are more economical or make their lives easier or safer, and then propel the brands that create those innovations to globally iconic levels. They can become lifelong loyal customers, and they can just as easily turn their backs on products, services and companies they've trusted for decades. And that can happen faster and faster in this rapidly changing environment.

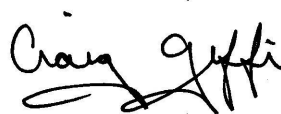
Deloitte's **Global Automotive Consumer Study** builds on automotive consumer research Deloitte's Automotive practice has been conducting since 2009. Informed by a continual outreach to global consumers through focused modules that survey consumers multiple times a year, Deloitte's **Global Automotive Consumer Study** delves into topics like consumers' interest in vehicle technologies, mobility choices, willingness to pay and customer digital engagement. Our research platform also allows for the rapid fielding of modules to test themes and trends that may emerge at different points in time, while maintaining a core of longitudinal data for comparisons over time. The result is a constant stream of data that helps deliver insight into consumers' mobility choices, and the factors that influence those decisions.

The following pages explore consumer interest in advanced vehicle technologies, including **self-driving technology, advanced safety and powertrain systems, cockpit technologies** and more. We highlight which technologies consumers' desire most, how much they are willing to pay for those features, their trust (or lack thereof) in full self-driving technologies, and who they trust to bring those technologies to market. We focus on six countries – the **United States, Germany, Japan, South Korea, China** and **India** in this report, and compare and contrast consumer sentiment in these markets – as a proxy for consumers worldwide – while 17 countries and over 20,000 consumers participated in the overall study.

Our hope is that you find these latest insights exploring consumers' technology preferences useful, and continue to look to Deloitte's Global Automotive Consumer Study, and our global Automotive practice for the latest perspectives on how consumers worldwide are approaching their mobility choices.



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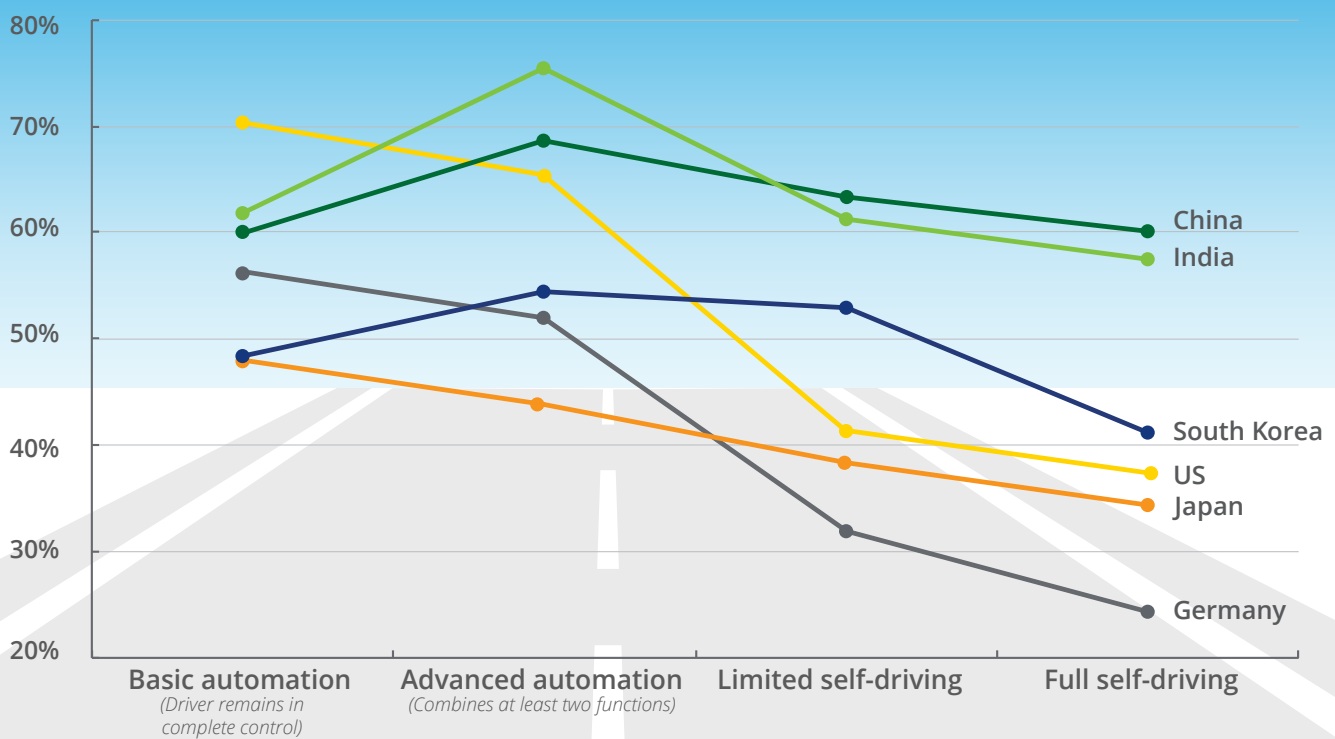
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What's ahead for autonomous vehicles?

Today, there is a lack of consensus among consumers and their most preferred advanced vehicle technologies, and ...

Interest in different levels of autonomous vehicle technology varies across global markets. Consumers in China and India appear most interested – perhaps due, in part, to the high number of accidents and road fatalities caused by human error.

Percentage of consumers who prefer different levels of vehicle automation



Source: Deloitte Global Automotive Consumer Study

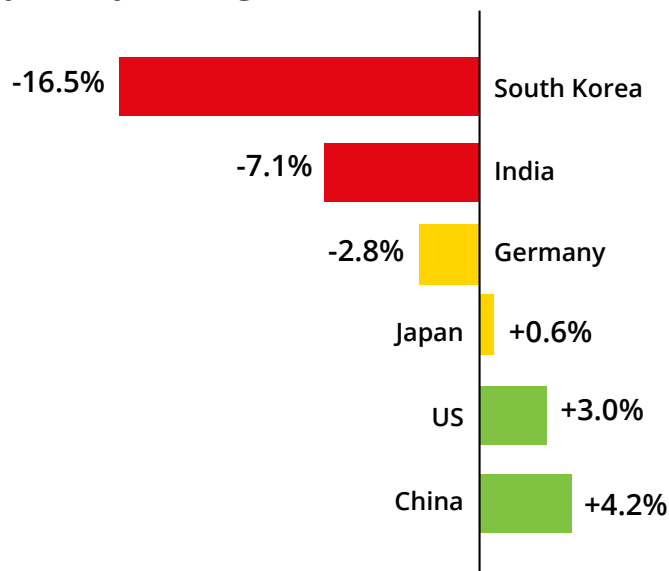


There is significant opportunity for automakers to capitalize on the success of individual self-driving features such as self-parking and lane control.

... enthusiasm for fully autonomous vehicles has flattened and even declined in several markets

Although interest in full self-driving capabilities has risen in both China and the US since 2014, the same cannot be said for other global markets, where interest has remained flat or declined, according to our survey.

Change in consumer preference for full self-driving vehicles since 2014

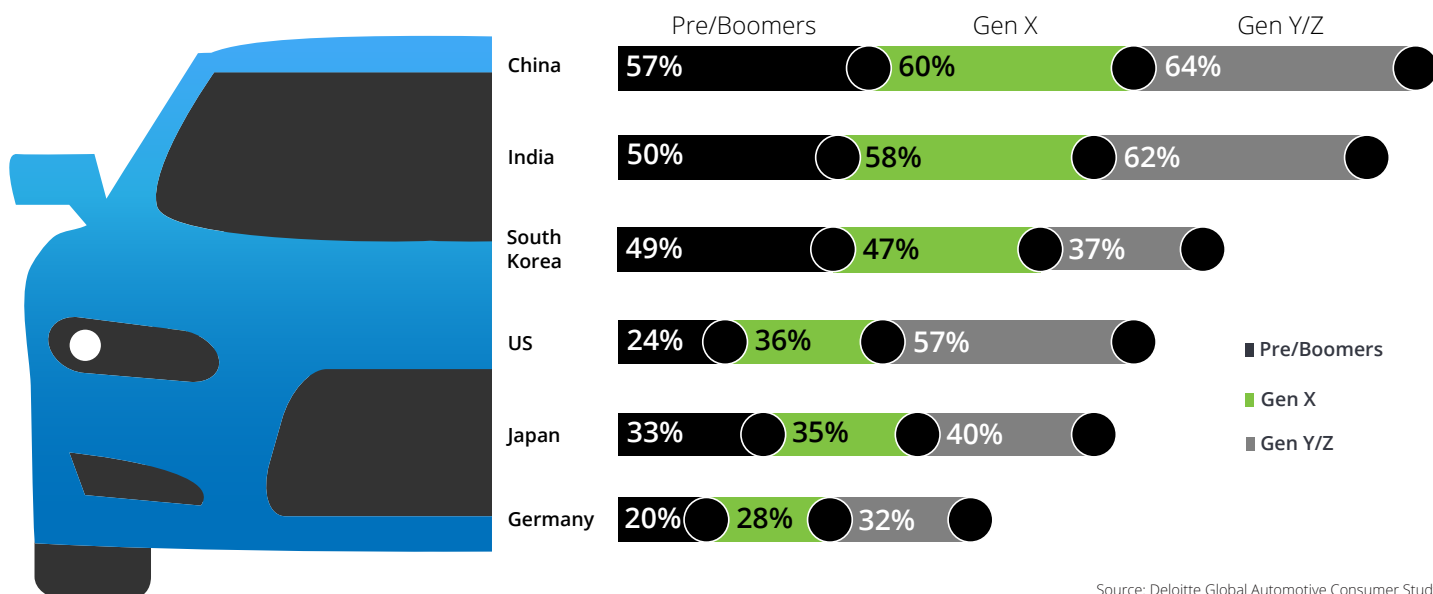


● Significant decrease ● Flat ● Significant increase

Source: Deloitte Global Automotive Consumer Study

Gen Y/Z consumers are generally more interested in fully autonomous vehicles

Consumer interest in fully autonomous vehicles, by generation



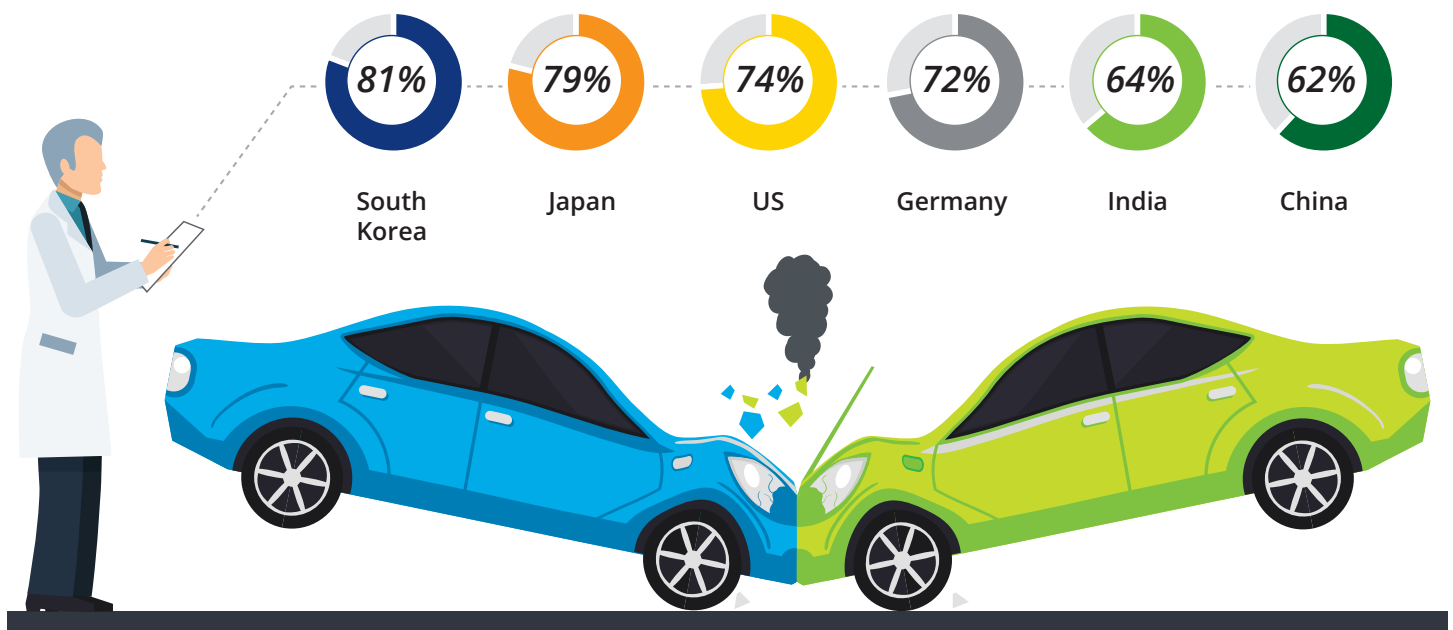
Source: Deloitte Global Automotive Consumer Study

Many consumers remain skeptical about a self-driving car's safety

Despite consumer interest today in fully autonomous vehicles, they have concerns with safety. And ...

While preference today for full self-driving vehicles varies, consumers at present appear consistent in their concerns regarding the safety of fully autonomous vehicles.

Percentage of consumers who feel full self-driving vehicles will not be safe



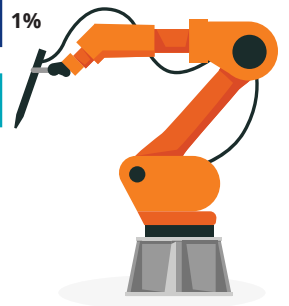
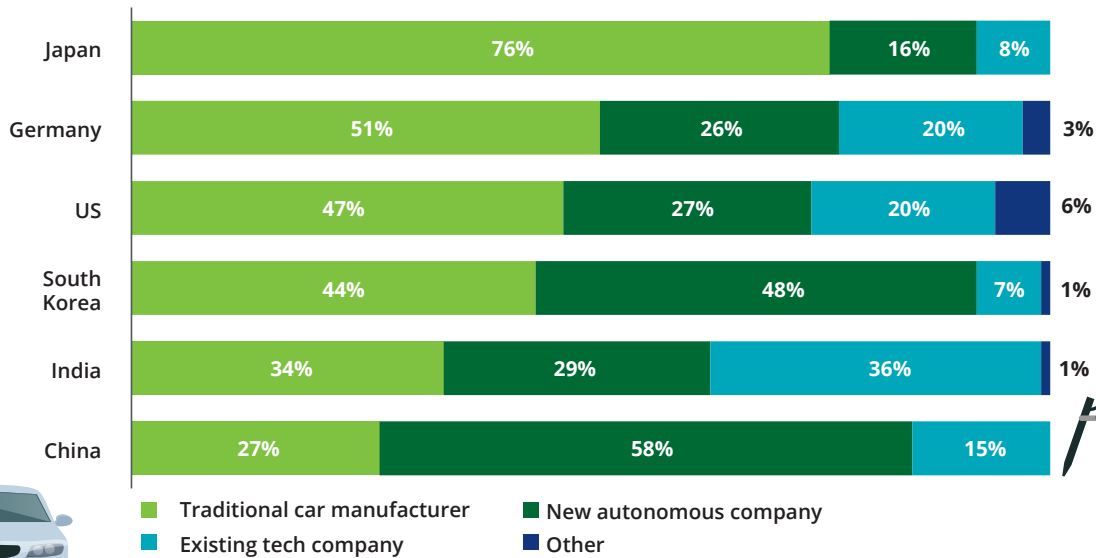
Source: Deloitte Global Automotive Consumer Study

... consumer opinion appears to diverge on whom to trust to bring self-driving cars to market

In several global markets, opinions diverge between auto and tech companies in terms of who people trust the most to make fully self-driving cars a reality of everyday life.

In some of the largest automotive markets, consumers appear to trust tech companies more than (or as much as) they trust automotive companies to bring fully autonomous technologies to market.

Types of companies consumers trust most to bring fully autonomous vehicles to market



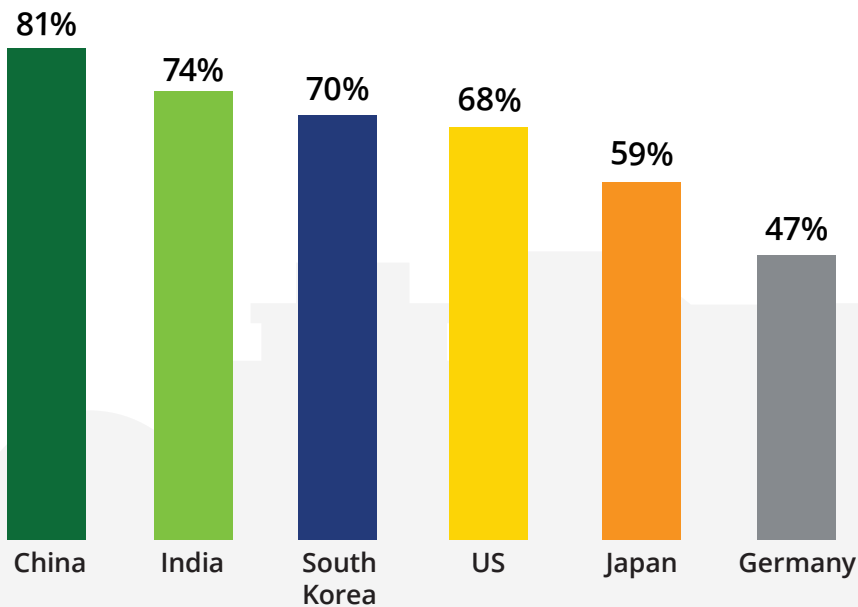
Source: Deloitte Global Automotive Consumer Study

More experience and successful examples would help build consumer trust

Having an established track record of fully self-driving vehicles operating safely on public roads is an important factor that could encourage consumer support for autonomous vehicles.



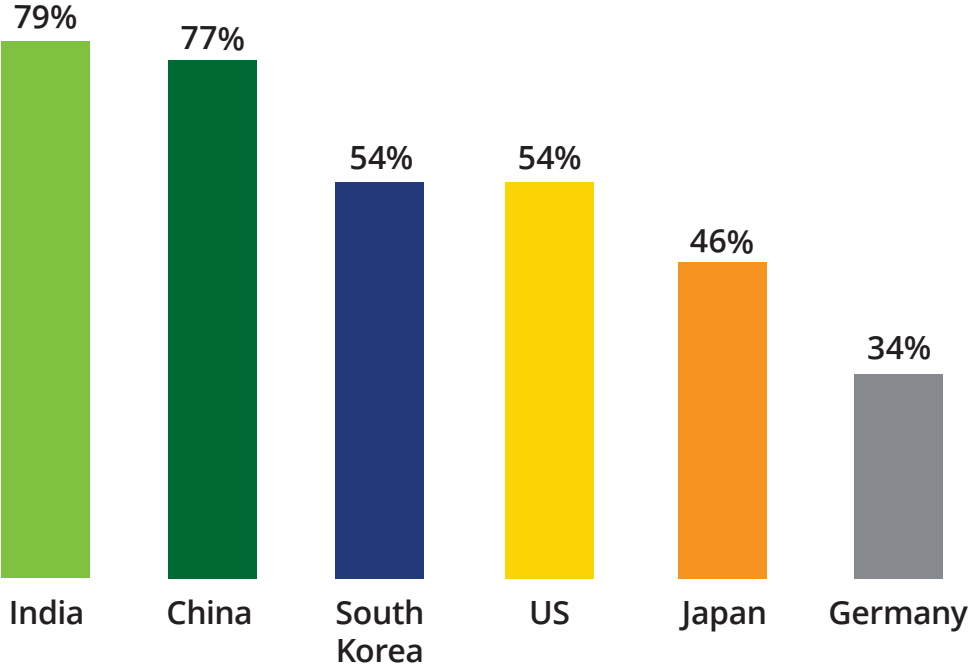
Percentage of consumers who feel an established track record of fully autonomous cars being safely used would make them more likely to ride in one



Source: Deloitte Global Automotive Consumer Study



Percentage of consumers who feel they would be more likely to ride in a fully autonomous vehicle if it were offered by a brand they trust



Source: Deloitte Global Automotive Consumer Study

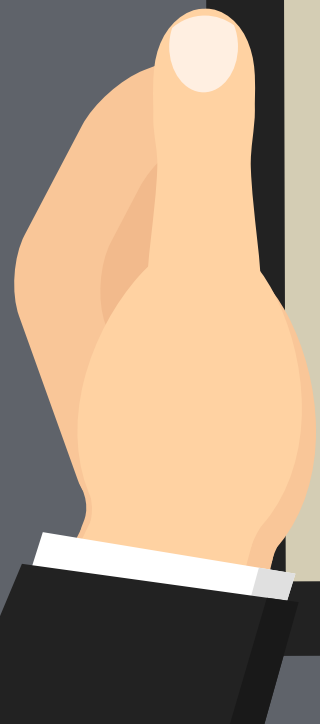


On the road to a fully autonomous future

Consumer preferences indicate that the road to self-driving must be paved with safety

Across the six focus countries, four technologies delivering advanced, predictive safety capabilities were consistently ranked as the most preferred when compared to a variety of advanced technology features.

Also noteworthy is what is not useful. For example, features that provide customized entertainment, notification of places of interest and technologies that manage daily activities are universally viewed as least useful – an important finding for manufacturers considering investing resources to offer these features in future vehicles.

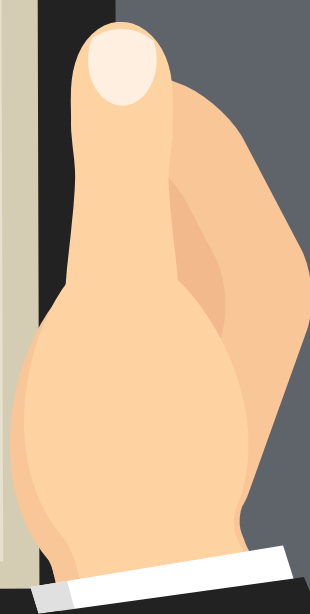


■ Viewed as most useful
 ■ Viewed as somewhat useful
 ■ Viewed as least useful

Advanced technology features that consumer say are most and least useful

Technology feature	Category	US	Germany	Japan	South Korea	China	India
Recognizes objects on road and avoids collision	Safety	1	1	1	2	1	1
Informs driver of dangerous driving situations	Safety	2	3	4	3	3	4
Blocks driver from dangerous driving situations	Safety	3	2	2	1	2	2
Takes steps in medical emergency or accident	Safety	4	4	3	4	4	3
Diagnoses and sends maintenance notifications	Connectivity	5	14	12	5	6	5
Enables remote shutdown of stolen vehicle	Cyber security	6	13	8	14	8	8
Helps enhance fuel efficiency	Fuel efficiency	7	5	6	11	12	7
Enables vehicles-to-vehicle and road communication	Connectivity	8	10	5	9	5	11
Prevents hacking into vehicle systems	Cyber security	9	15	19	17	22	13
Prevents theft by restricting unauthorized access	Cyber security	10	7	16	20	18	10
Enables use of advanced lightweight materials	Fuel efficiency	11	11	14	12	7	12
Enables interactive vehicle operational information	Convenience	12	16	18	19	20	17
Enables usage of alternative fuels	Environment	13	6	9	6	11	6
Automates tasks for comfort and convenience	Convenience	14	12	10	7	9	14
Lowers the impact on the environment	Environment	15	8	15	13	16	9
Enables hands-free interior controls	Convenience	16	23	26	30	29	24
Monitors the physical health of the driver	Safety	17	9	13	16	13	15
Enables high-speed, long-distance, highway "auto-pilot" mode	Self-drive	18	17	11	8	15	19
Enables remote/automatic software updates of the vehicle	Connectivity	19	25	24	21	31	22
Allows use of smartphone applications through the vehicle dashboard	Connectivity	20	28	32	29	27	26
Enables full self-driving capabilities	Self-drive	21	20	7	10	14	20
Coaches the driver to drive safely	Cost efficiency	22	18	17	18	10	16
Makes available adjustable settings to enhance vehicle performance	Performance	23	21	20	15	23	18
Assists in locating, reserving, and navigating to a parking space	Service enabler	24	19	25	25	17	21
Enables the use of self-healing paint	Miscellaneous	25	24	23	27	25	32
Provides passengers with customized entertainment while driving	Convenience	26	32	30	28	30	28
Provides notifications when places of interest are near	Service enabler	27	26	31	31	26	23
Automatically pays parking and toll fees	Service enabler	28	27	22	26	21	30
Empowers customer to personalize vehicles	Miscellaneous	29	30	28	22	28	27
Allows the driver to control automated home systems	Service enabler	30	29	29	24	24	29
Enables low-speed urban "auto pilot" mode	Self-drive	31	22	21	23	19	25
Helps manage daily activities	Convenience	32	31	27	32	32	31

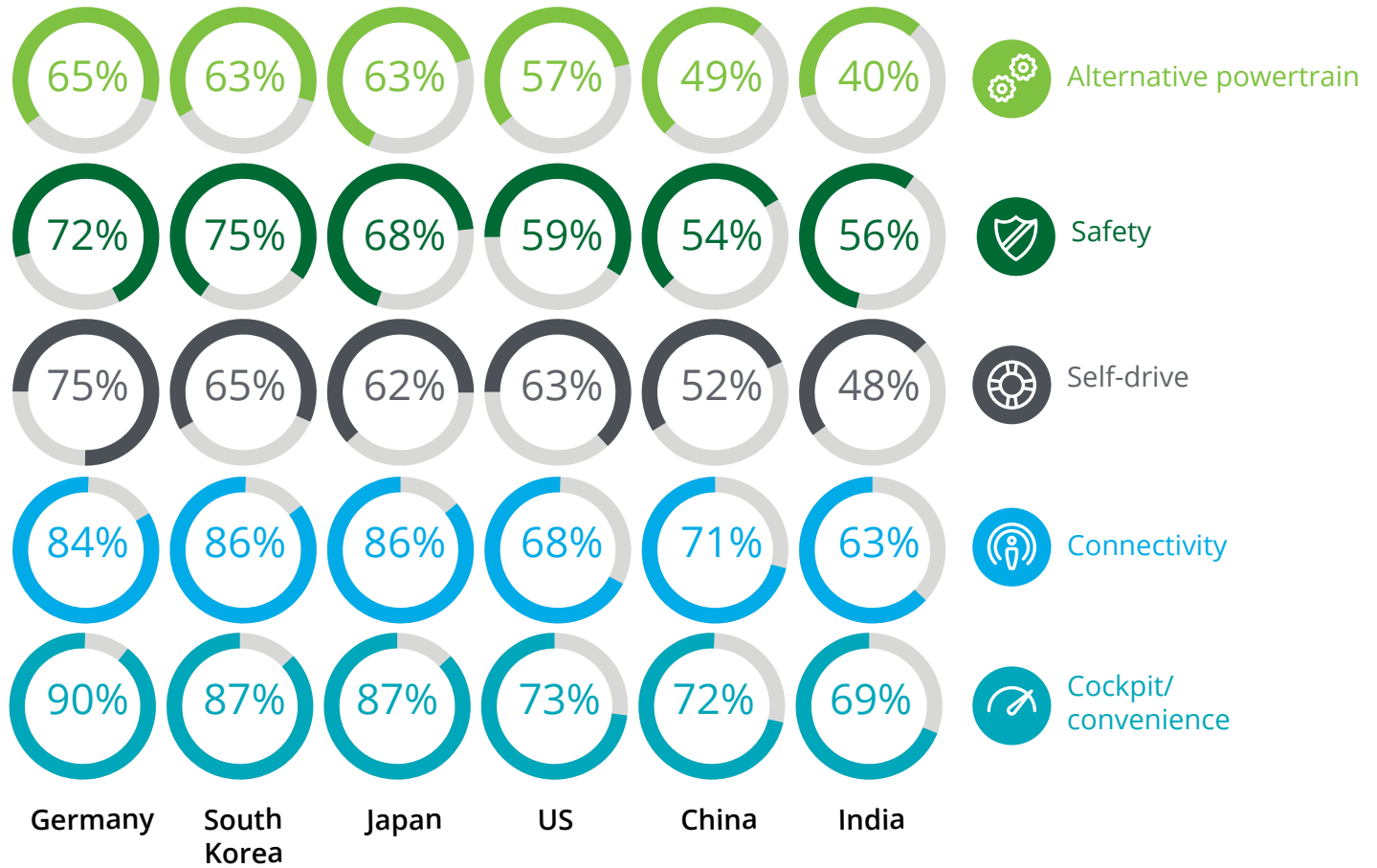
Source: Deloitte Global Automotive Consumer Study



Are people willing to pay for advanced technology?

Generally, consumers are willing to pay a little extra for access to advanced technology features, but ...

Percentage of consumers who are NOT willing to pay more than \$500 for various advanced vehicle technologies



Source: Deloitte Global Automotive Consumer Study

Automakers in Japan are under growing pressure from regulators to standardize more advanced safety features, rather than leveraging them for extra profit.²

... the amount consumers are willing to pay has declined significantly since 2014

Since 2014, there has been a considerable decline in stated willingness to pay. Even Japan, where consumers tend to pay for new technologies, posted a 48 percent drop in the average amount consumers are willing to pay for advanced automotive technologies.

Overall expected price which consumers are willing to pay for advanced automotive technologies (2014 and 2016)*



* The dollar value for each country represents the average of overall weighted prices across the five technology categories (safety, connectivity, cockpit/convenience, self-drive, and alternative powertrain). The non-USD currency has been converted into USD by using the average exchange rates in 2016.

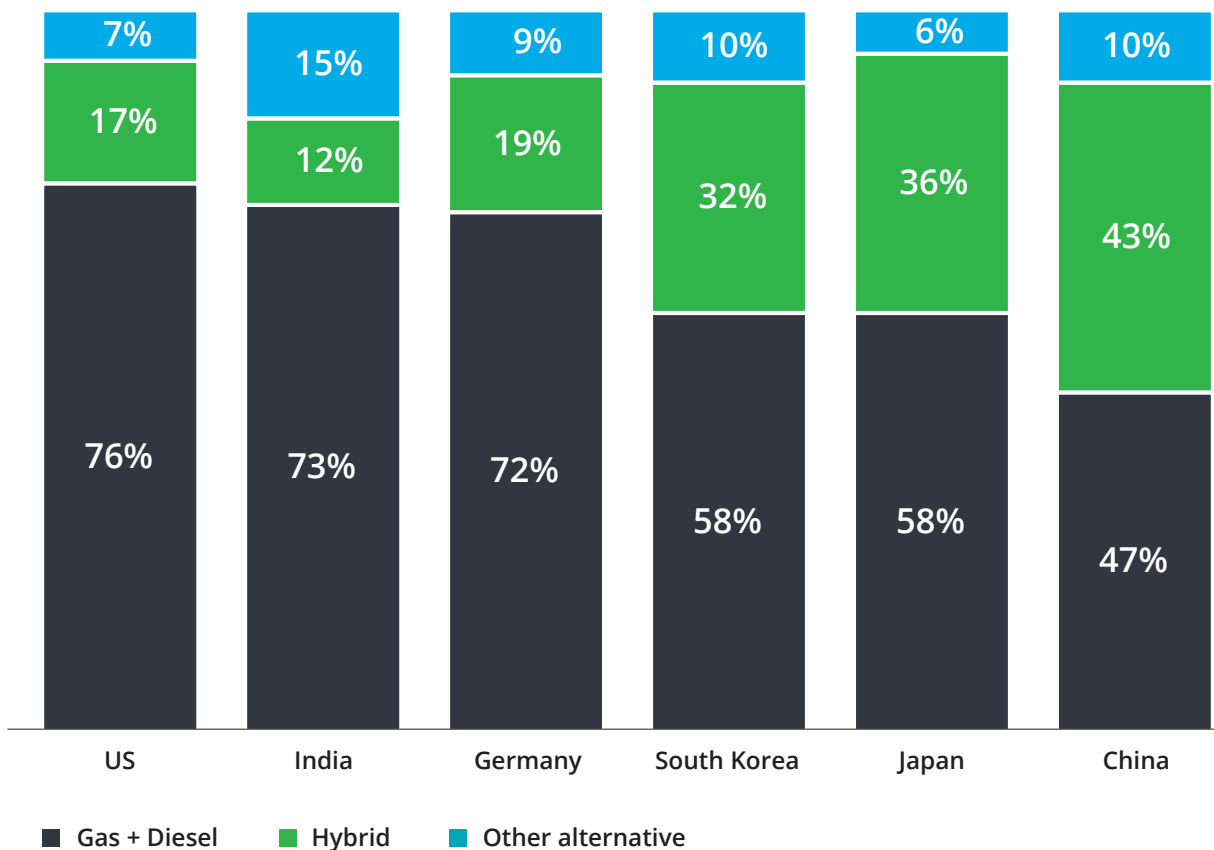
Consumers expect advanced technology features that were once considered premium options to become standard features that do not increase the price of the vehicle.

Honk for hybrids and alternative powertrains

Global demand for hybrid vehicles could rise significantly in the next three to five years

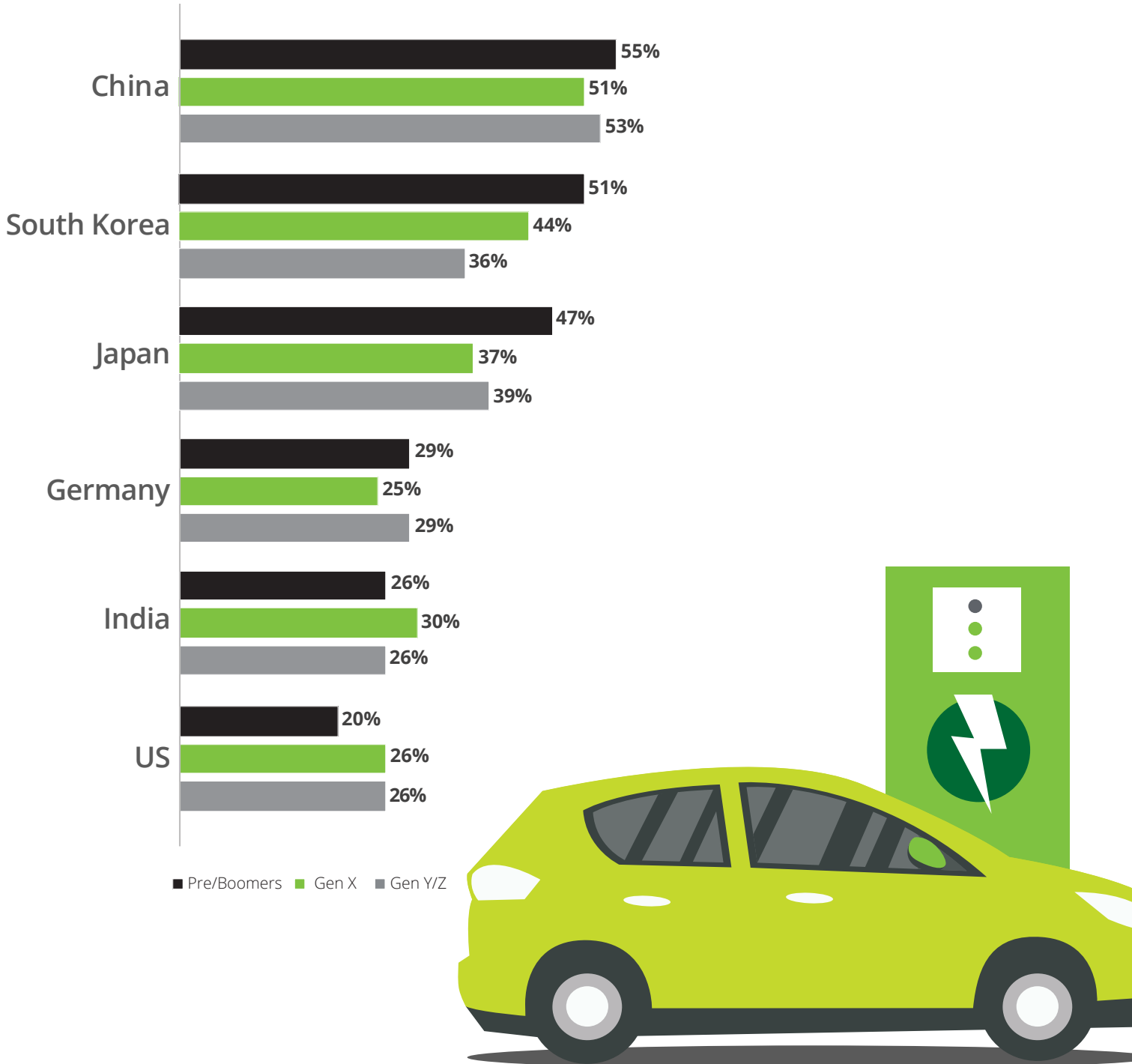
Consumer interest in alternative powertrain technologies could signal an opportunity for automakers, particularly in Asian markets like China, Japan and South Korea where consumers are significantly more interested in an alternative powertrain for their next vehicle.

Consumer preference for various powertrain technologies in their next vehicle



Source: Deloitte Global Automotive Consumer Study

Percentage of consumers, by generation, who would prefer an alternative powertrain in their next vehicle



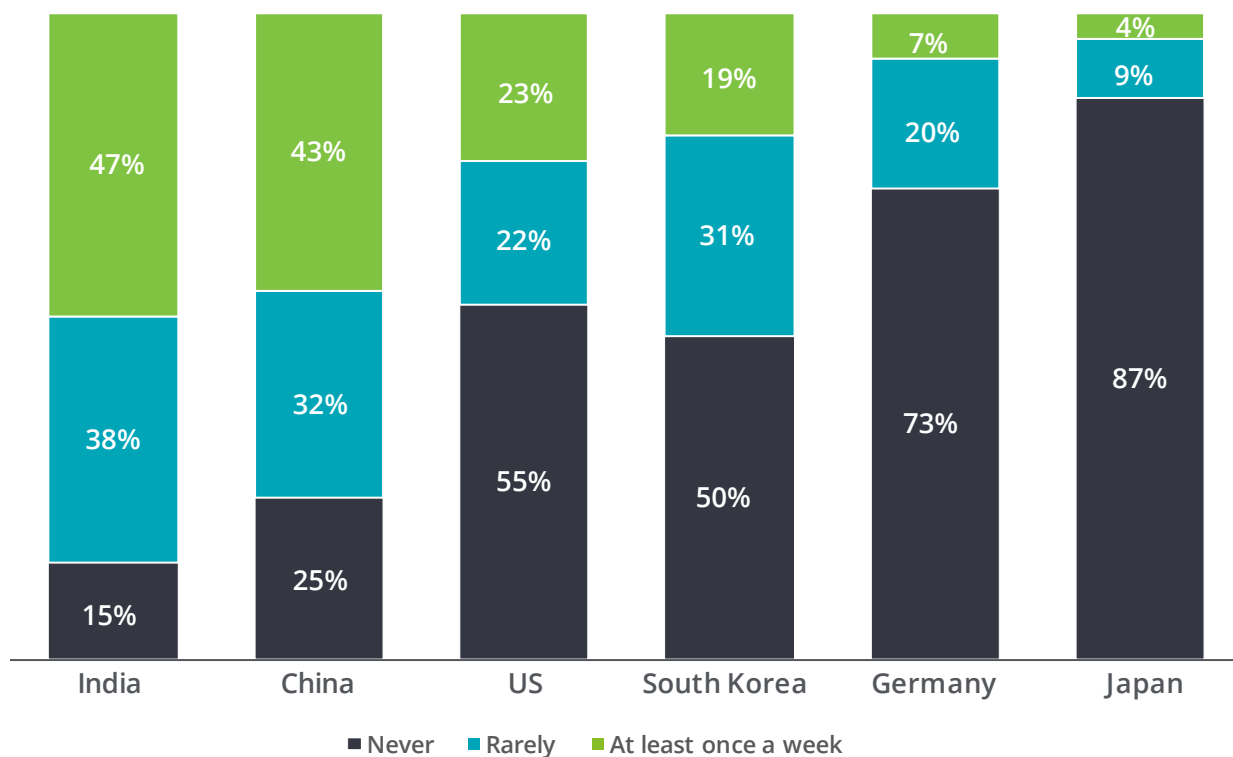
Source: Deloitte Global Automotive Consumer Study

Do consumers prefer to ride or drive?

Plenty of room for mobility services to grow and disrupt traditional notions of car ownership ...

Ride-hailing services are not heavily used yet in many markets (particularly in Japan, where the regulatory environment discourages use of mobility services). Use of these services in India and China far outpace other global markets. In fact, almost half of consumers in emerging markets like China and India use ride-hailing services at least once a week, eclipsing the US and South Korea, and well ahead of Germany.

Percentage of consumers who use ride-hailing services, by frequency

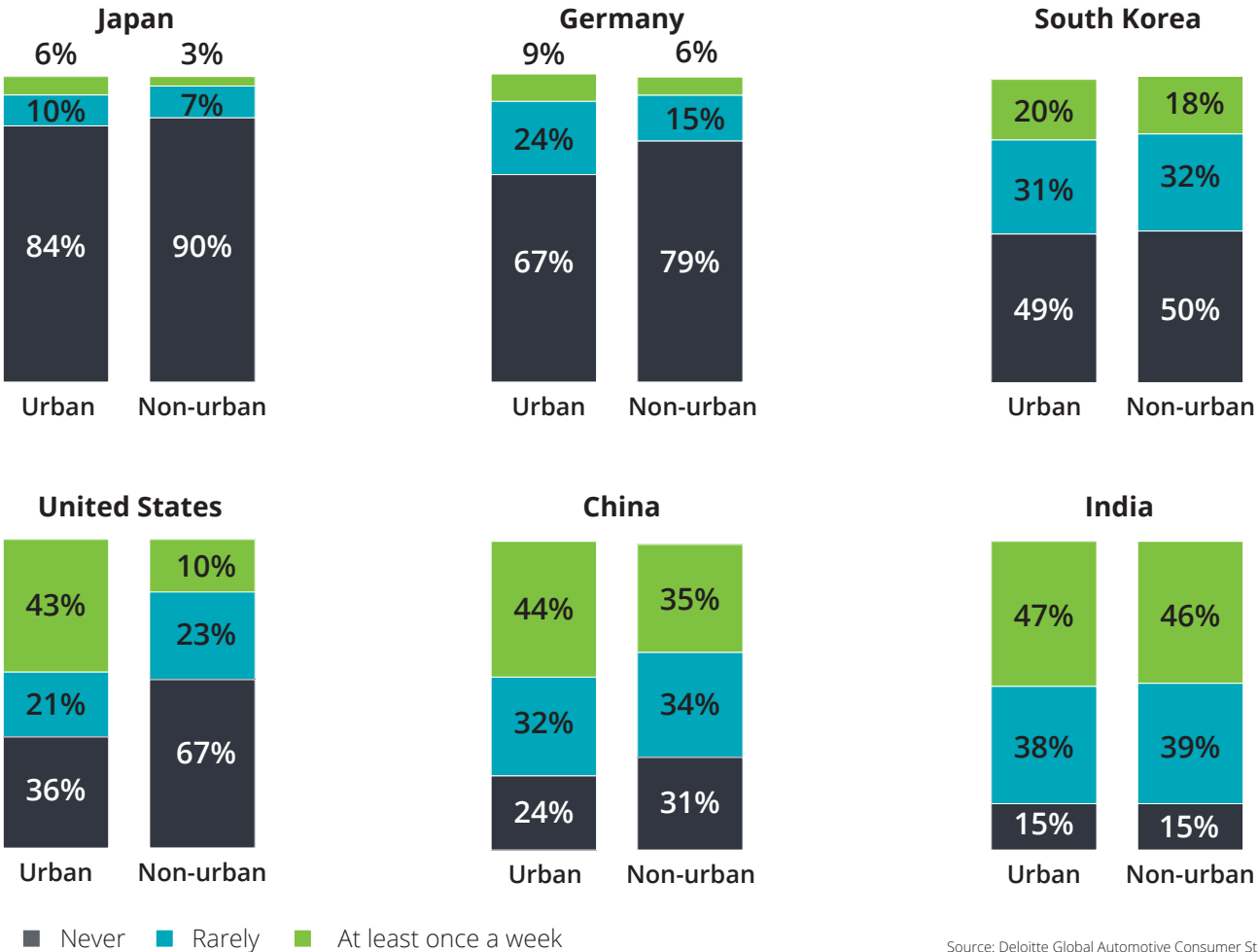


Source: Deloitte Global Automotive Consumer Study

China has the largest share of total worldwide ride-on-demand downloads at 43 percent of the global total in 2016.³

... but the adoption of ride-hailing services in urban and non-urban settings varies between countries

Percentage of consumers who use ride-hailing services, by frequency and area



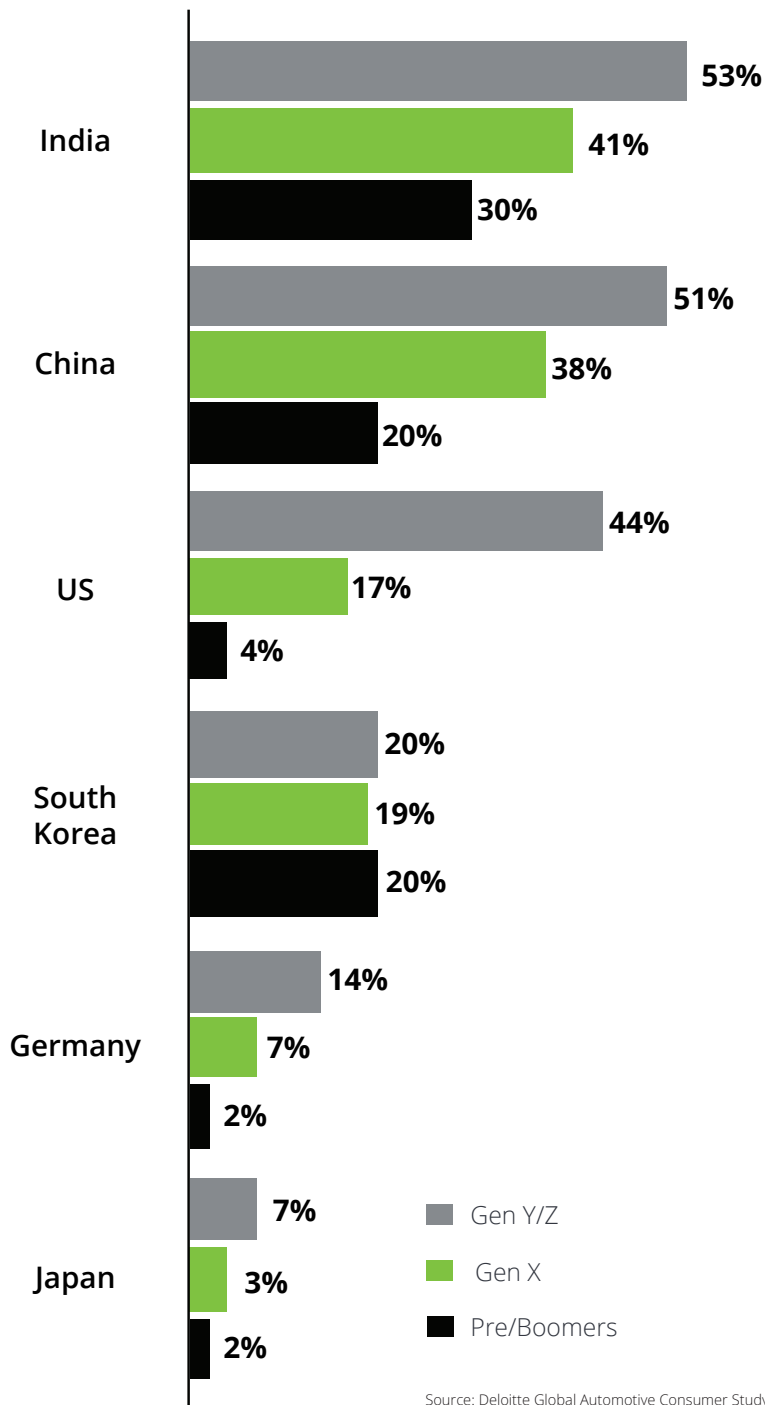
Source: Deloitte Global Automotive Consumer Study

Note: Ride-hailing (or ride-sharing as it's better known in some global markets) is defined in this study as mobility services wherein consumers hire a car/driver via their mobile device.

Gen Y/Z consumers are more inclined to use mobility services, and ...

Perhaps unsurprisingly, younger Gen Y/Z consumers in most global markets are more likely to use ride-hailing services as compared to older consumers.

Percentage of consumers who use ride-hailing services at least once a week, by generation

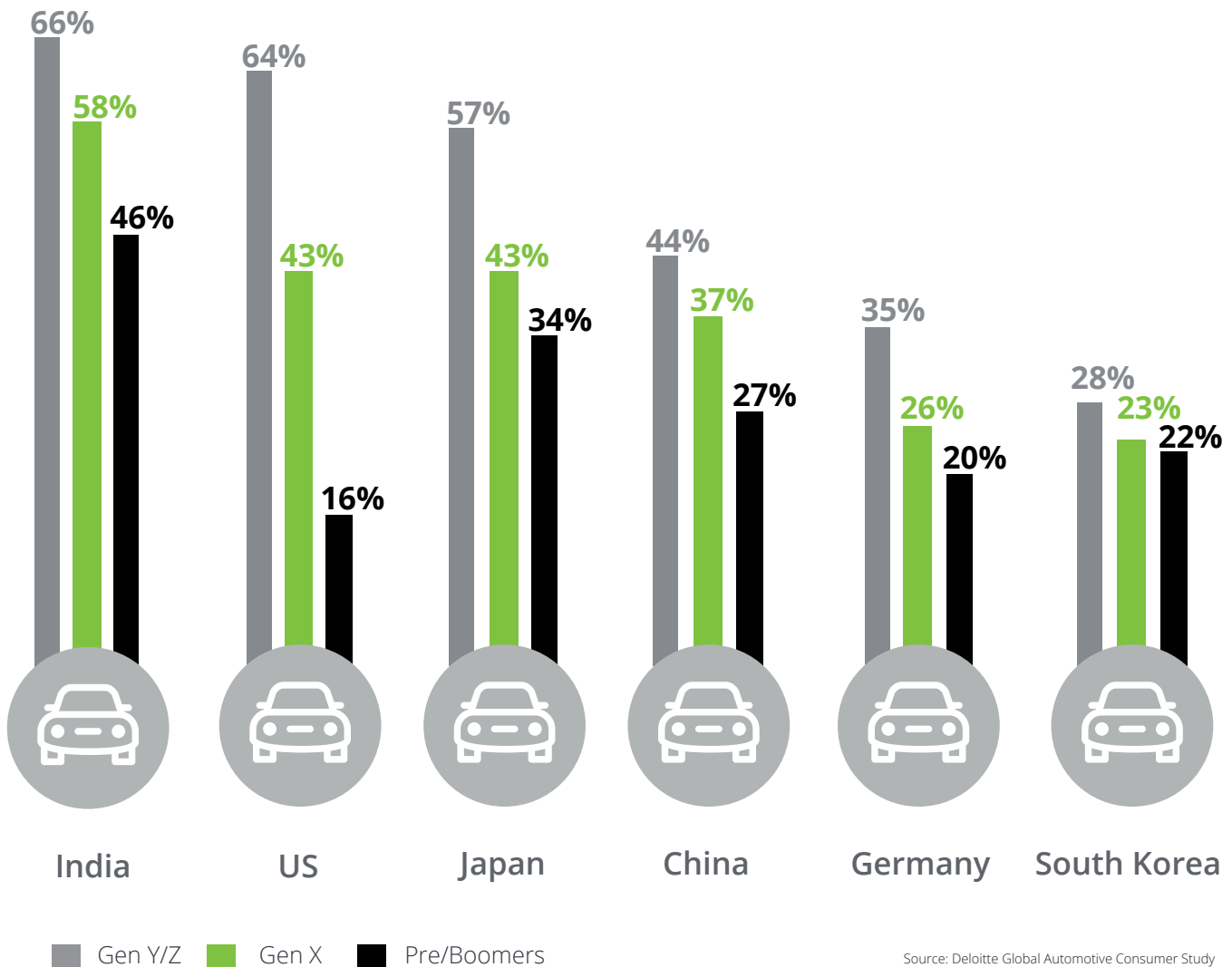


Source: Deloitte Global Automotive Consumer Study

Ride-on-demand, folded more broadly into shared mobility and transportation services, will disrupt car ownership, especially in India.⁴

... those young consumers who regularly use ride-hailing are also more likely to question their need to own a vehicle than older consumers

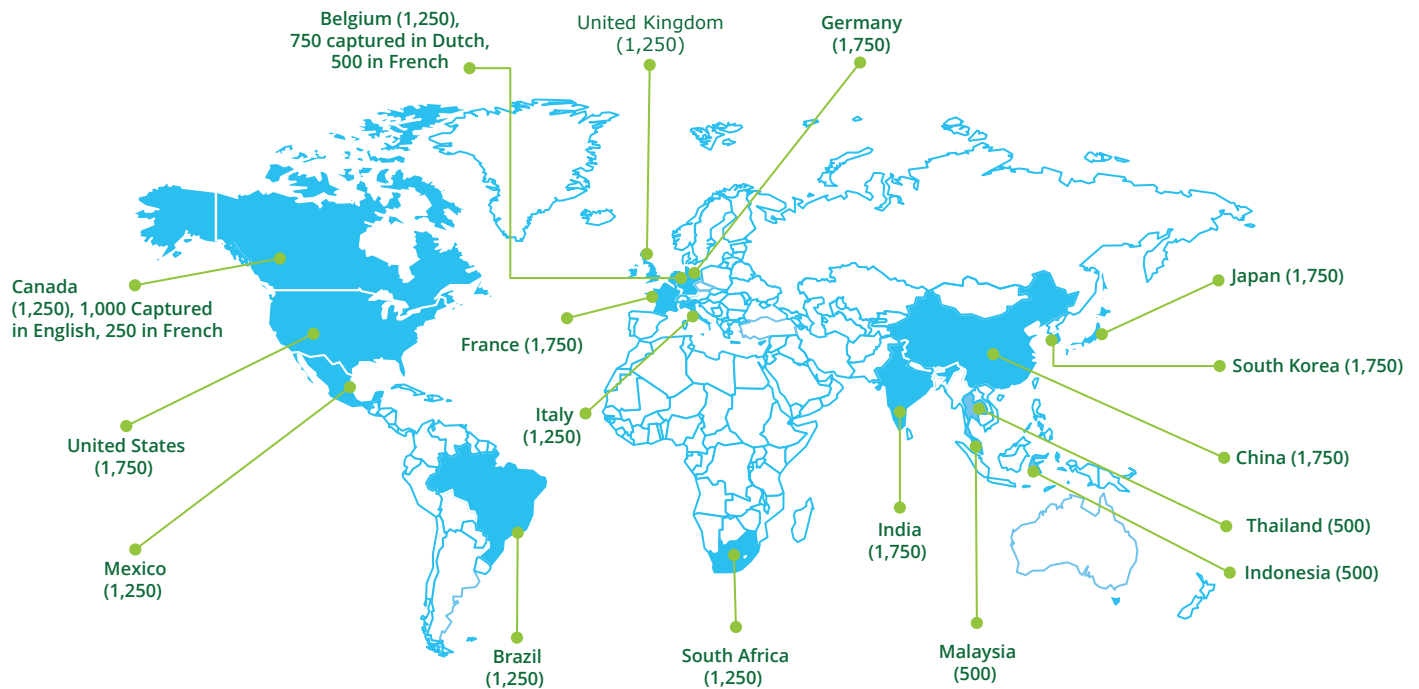
Percentage of consumers who use ride-hailing services that question whether they need to own a vehicle in the future, by generation



Source: Deloitte Global Automotive Consumer Study

About the Global Automotive Consumer Study

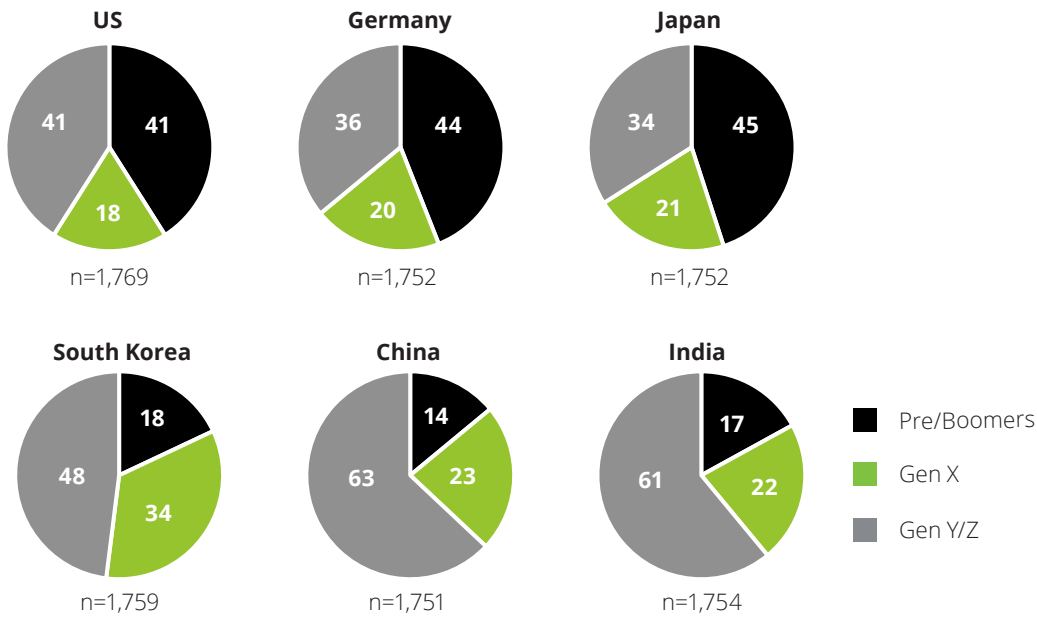
The Global Automotive Consumer Study surveyed over 22,000 consumers in 17 countries around the world.



All the data included in this report has been derived from the study unless otherwise noted.

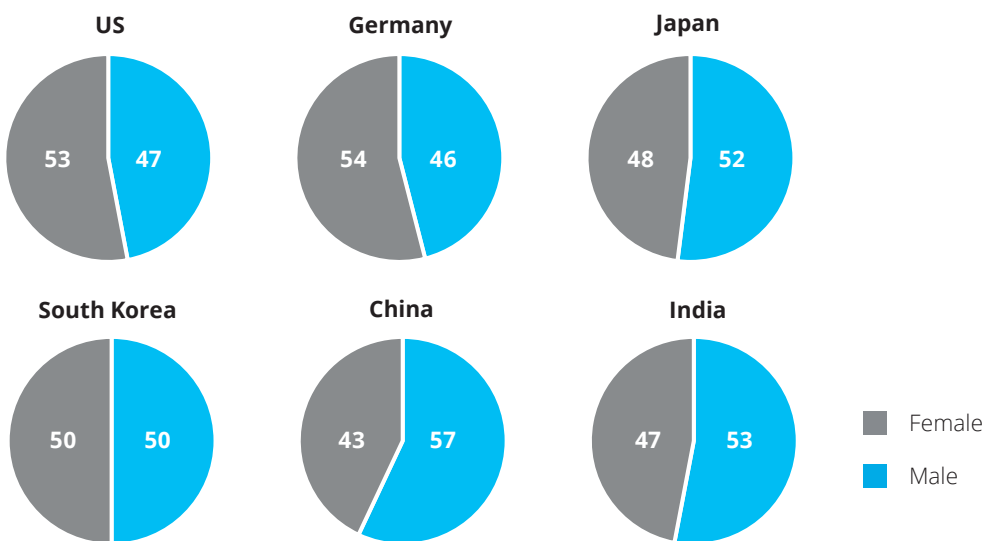
The findings in this report represent male and female consumers across multiple generations living in the United States, Germany, Japan, South Korea, China and India.

Respondents, by generation



Note: Pre/Boomers: Born before 1965; Gen X: Born between 1965-1976; Gen Y/Z: Born after 1976 (sample excludes consumers under 16 years of age)

Respondents, by gender



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Endnotes

¹ 2014 annual GDP listed at \$17,420.7 billion. US Bureau of Economic Analysis, "Gross Domestic Product: Fourth quarter and annual 2014," released January 27, 2015, www.bea.gov/newsreleases/national/gdp/2015/pdf/gdp4q14_adv.pdf, accessed September 18, 2015.

² The Wall Street Journal, "Toyota Safety Features Linked to Self-Driving Strategy, Technology Chief Says," October 19, 2016.

³ Morgan Stanley Research, "Autos & Shared Mobility: Global Investment Implications of Auto 2.0," April 19, 2016.

⁴ Ibid.



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