

# VIA VISION

VOLKSWAGEN GROUP

• SHAPING THE FUTURE OF MOBILITY

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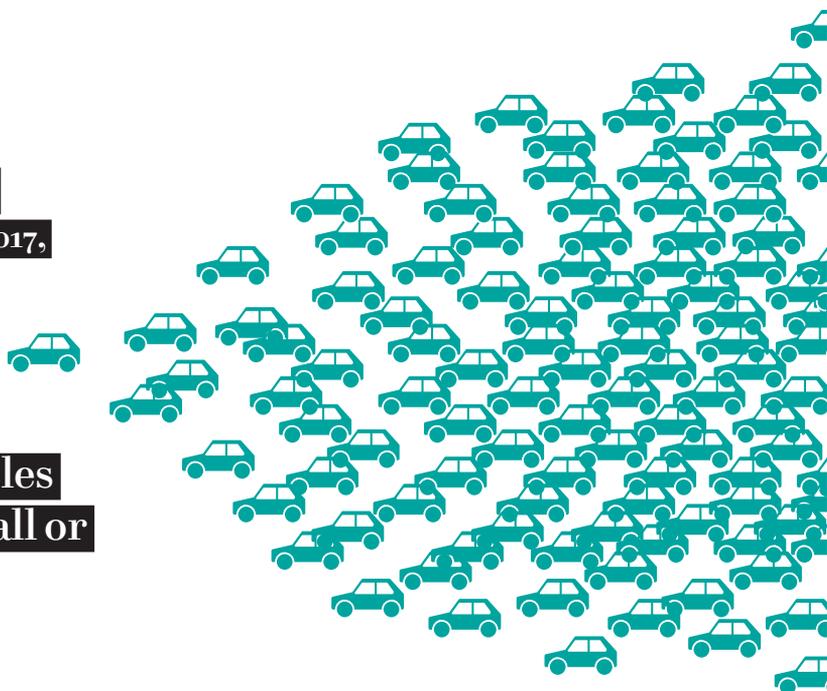
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## The New Big

### Small Cars Drive Mobility

**280,000 micro cars**  
**will be sold in Europe in 2017,**  
**according to estimates.**

**70 percent**  
**of car sharing vehicles**  
**in Germany are small or**  
**mini cars.**



# Mobility for Everyone

## More People in Motion

**Editorial**



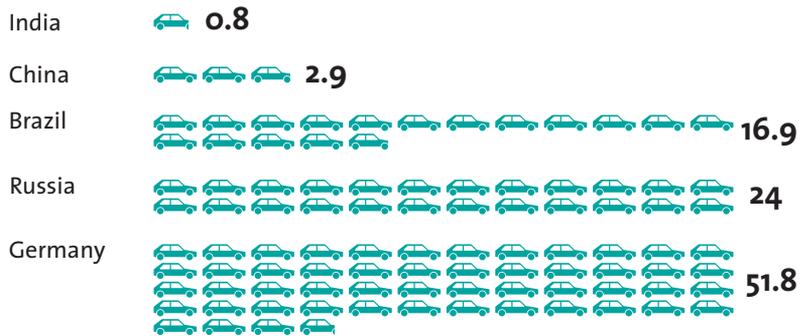
*Dr. Ulrich Hackenberg, Member of the Board of Management of Volkswagen Brand with responsibility for Research and Development.*

Everyone wants to be mobile, yet many people are not. However, there are many ways to get them on the road: small cars, for example, that are equipped with the latest technology but are affordable nonetheless. How the democratization of mobility is fostered on top of that, you will find out in this edition of VIAVISION.

Happy reading.

To drive anywhere at any time: Those who own a car are free and independent. But not everyone can afford one. Especially in emerging nations where generally people do not earn very much, the motorization of the population is comparatively low. This is why small cars will be the next big thing there. E-bikes, taxis or car sharing are other ways of granting many people individual access to mobility. In Germany, too, these alternatives are getting more and more popular.

**Selected global car densities:**  
(cars per 100 inhabitants)



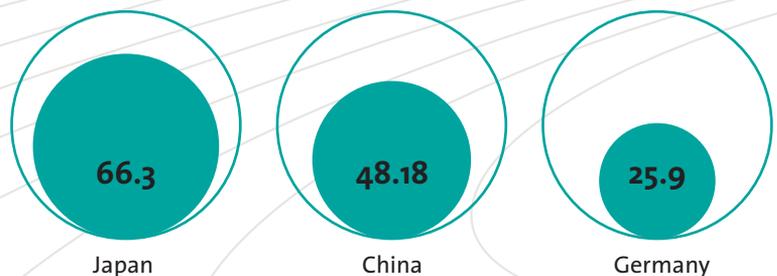
*While one in two Germans owns a car statistically; in India the rate is presently less than one in a hundred. There is an upward trend, as is the case in the other BRIC countries China, Brazil and Russia.*

Sources: Germany Trade and Invest (as of 2010, India and Russia as of 2011); Association of the German Automobile Industry, VDA (as of 2010)

*There is a tradition of driving small cars in Japan: In 1949 a special norm for micro cars was introduced because of the lack of parking spaces. While Japan has regulated the length for this segment to a maximum of 3.4 meters, there are still no fixed values in Germany.*

Sources: Germany Trade and Invest; Federal Motor Transport Authority of Germany, KBA; Japan Automobile Manufacturers Association

**Share of the small and mini car segment of car sales in 2010:**  
(in percent)

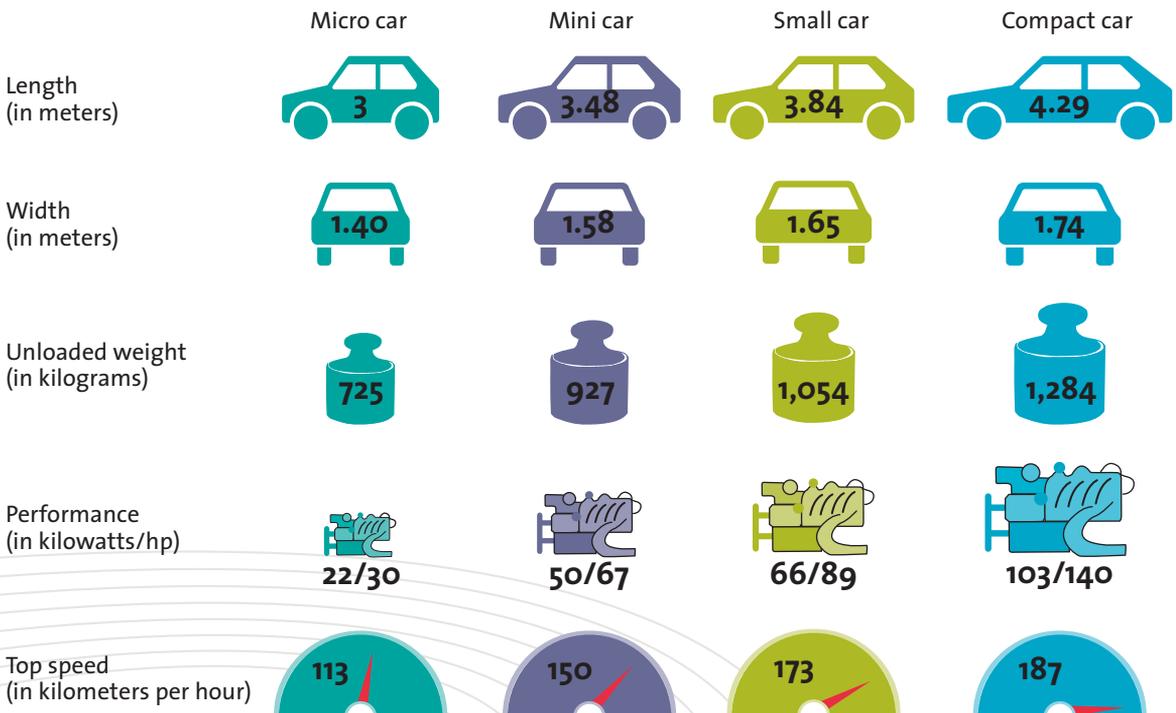


# Minimalism

## Small Is the New Big

While small cars have been shaping the street scene in Japan or Brazil for a long time, the trend in Europe is slowly but surely pointing towards minimalism too. Small cars are cheaper than their bigger relatives in terms of price and maintenance, and constitute a response to growing environmental awareness. A new generation of small cars is already waiting at the starting blocks, the so called micro cars.

### Key data of car segments:



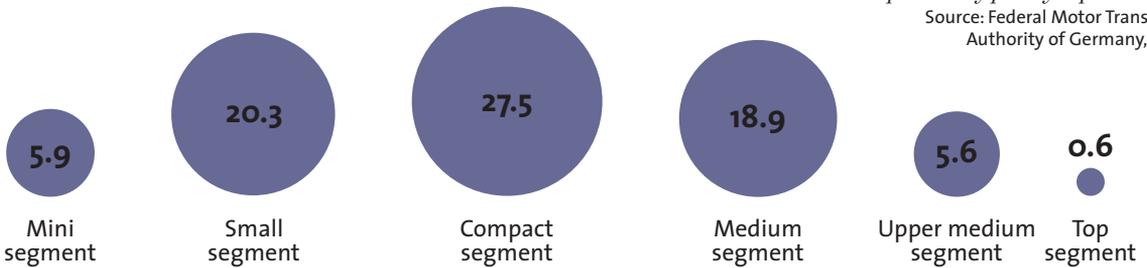
*Small does not equal small: Market research company Frost and Sullivan defined micro cars as the especially small vehicle segment and specified a range of key data, average values are shown above. The Federal Motor Transport Authority of Germany has not yet provided a definition but divides car models into the mini, small and compact car segments based on optical, technical and market orientated characteristics. VIAVISION wanted to get to the bottom of this and has calculated the average key data for the 166 cars currently in these three segments.*

Sources: Frost & Sullivan (as of 2011); own calculations (based on data by the Federal Motor Transport Authority of Germany, KBA, and manufacturers)

**Total number of cars in 2010 in Germany by segments:**  
(in percent)

*More than half of the over 42.3 million cars in Germany belong to three segments (mini, small and compact car) while the bigger models that are more expensive in terms of purchase and maintenance are comparatively poorly represented.*

Source: Federal Motor Transport Authority of Germany, KBA



**30** percent more cars were on the road in Germany in the mini segment in 2010 – compared to 2003, 17.5 percent for the small car segment.

Source: Federal Motor Transport Authority of Germany, KBA

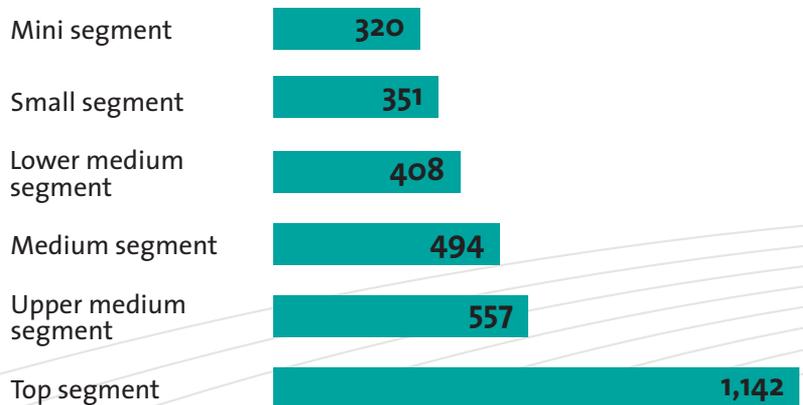
**280,000** micro cars will be sold in Europe in 2017, according to estimates, compared to only 27,113 back in 2007.

Source: Frost & Sullivan (as of 2011)

**7** out of the top ten cars in the environmental ranking of the German Traffic Association are small or mini cars, the remaining three are hybrids in the compact segment.

Source: German Traffic Association, VCD (as of 2011)

**Car cost by vehicle segment:**  
(in euros per month)



*Small drives cheaply: According to the German Automobile Association ADAC, the cheapest car in the mini segment costs the driver 320 euros a month, when driven over four years, not exceeding 15,000 kilometers per year. The cheapest car in the top segment, however, costs more than three times as much.*

Source: ADAC (as of 2011)

# On Two Wheels

## Vehicles for Every Angle

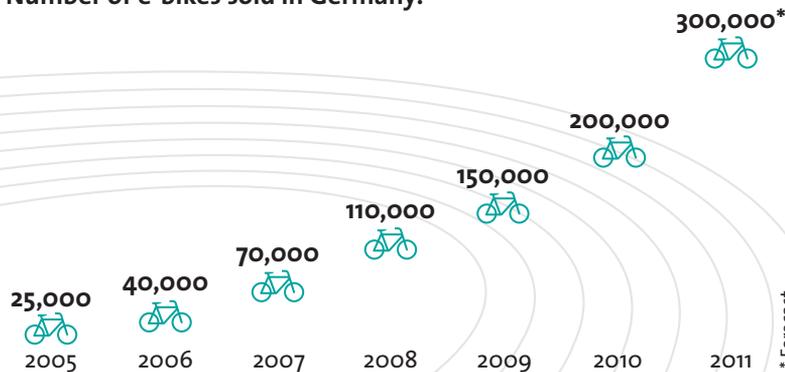
If you want to make quick progress away from major streets and railways, you can simply hop onto the e-bike. The often foldable, electric bicycles are used as a primary or secondary vehicle: They are either used on departure from the house or taken in a car, or on public transport, just in order to travel the final distance.

### The e-bike

<b>Drive:</b>	engine and/or foot pedal
<b>Motor:</b>	500, 1,000 or 4,000 Watts
<b>Maximum speed:</b>	20, 25 or 45 kilometers per hour (engine only)
<b>Range:</b>	up to 50 kilometers
<b>Average weight:</b>	25 kilograms
<b>Requirements:</b>	evidence of insurance, operating license, category M or B driver's license for speeds above 45 kilometers per hour, obligatory helmet for speeds above 20 kilometers per hour
<b>Cost:</b>	from 1,800 euros

Source: German Bicycle Club, ADFC (as of 2009)

### Number of e-bikes sold in Germany:



The amount of e-bikes sold in Germany has increased 12 times over the last six years. The sales figures also include Pedelecs, bicycles with a comparatively weak 250 watts engine, which supports the rider but which cannot power the bike on its own.

Source: German Cycle Industry Association, ZIV (as of 2011)

### Yikebike



The rider of the Yikebike puts his feet down while riding and steers the electric vehicle with the handlebar behind the seat.

<b>Range:</b>	ten kilometers
<b>Maximum speed:</b>	20 kilometers per hour
<b>Battery charging time:</b>	55 minutes
<b>Weight:</b>	ten kilograms
<b>Cost:</b>	from 1,400 euros

Source: YikeBike (as of 2011)

### Segway



The Segway is controlled by the driver's weight: If you lean forward, backwards or to the side then the vehicle drives in that particular direction.

<b>Range:</b>	40 kilometers
<b>Maximum speed:</b>	20 kilometers per hour
<b>Battery charging time:</b>	eight to ten hours
<b>Weight:</b>	50 kilograms
<b>Cost:</b>	from 8,000 euros

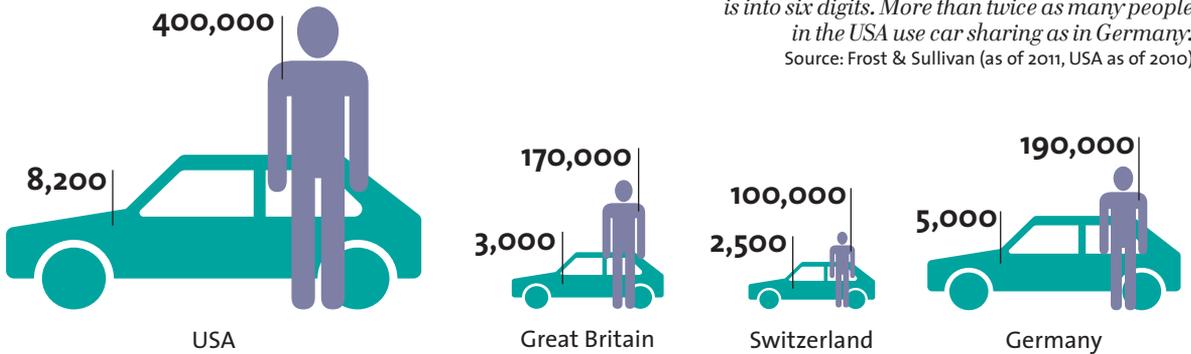
Source: Urban Mobility Germany (as of 2011)

# One Car for Many

## Car Sharing Gathers Speed

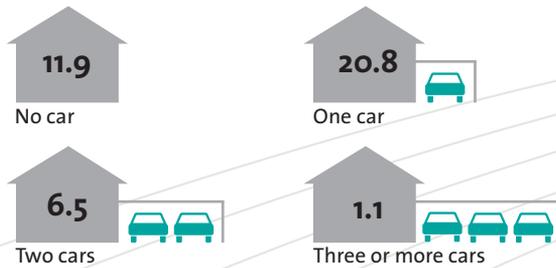
Sharing cars instead of owning them – that is the principle of car sharing. Particularly in large cities there are fleets of mostly small and efficient vehicles which can be used spontaneously by registered members. This is of particular interest to people who do not, for cost reasons, own a car of their own. When using car sharing one pays significantly less for driving per month than a car owner. Meanwhile many car companies have entered this growing market with their own car sharing fleets.

### Car sharing globally: (number of participants and vehicles)



*Germany is the largest car sharing market in Europe, followed by Great Britain and Switzerland. In all three countries the number of participants is into six digits. More than twice as many people in the USA use car sharing as in Germany.*  
Source: Frost & Sullivan (as of 2011, USA as of 2010)

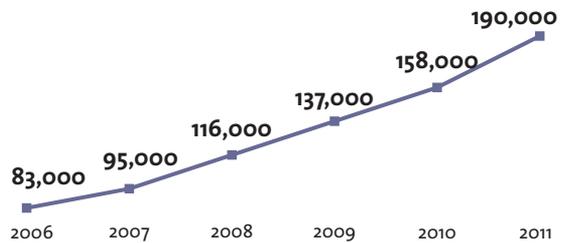
### Number of households by car ownership: (in millions)



11.9 million German households have no car. The 20.8 million households with just one car are also part of the potential target group for car sharing.

Source: Federal Statistical Office of Germany (as of 2010)

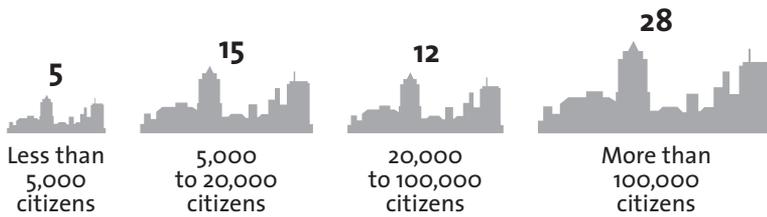
### Car sharing users in Germany:



Since 2006 the number of car sharing users has doubled. It has particularly increased in large cities and densely populated areas.

Source: Federal Car Sharing Association of Germany (as of 2011)

**Proportion of car sharers in German cities by population:**  
(in percent)



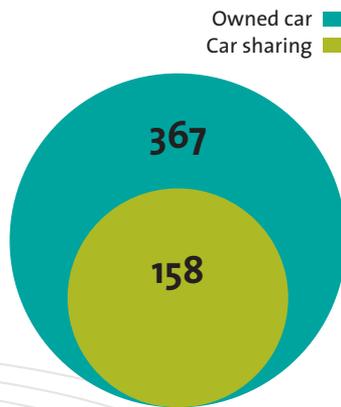
*The bigger the city, the larger the proportion of people car sharing. In large cities, that is those with more than 100,000 inhabitants, an average of just under 30 percent of residents are registered with car sharing services.*

Source: Focus Medialine (as of 2009)

**Monthly car-cost:**  
(in euros)

*Driving a car for half the price: When driving 750 kilometers per month in a rented small car, one pays about half as much as compared to driving the same distance in an owned car – assuming a price per kilometer of 16 cents and an hourly cost of 1.50 euros, with 15 hours of usage per month. The admission fee of 30 to 100 euros was not taken into account.*

Sources: ADAC (as of 2010); carsharing-vergleich.de (as of 2011)



**Car sharing in numbers**

**128** car sharing agencies are currently operating in Germany. The largest two agencies own nearly half of all German car sharing vehicles.

**38** customers utilize every car sharing vehicle.

**4 - 8** private cars are replaced by one car sharing vehicle. They would otherwise take up parking space of 35 to 84 square meters.

**70** percent of vehicles in car sharing fleets can be classified as small or micro cars.

Source: Federal Car Sharing Association of Germany (as of 2011)

**Quicar – Share a Volkswagen**

This autumn the first Volkswagen car sharing fleet will be set into motion. 200 Golf BlueMotions are standing by to be rented in Hanover. Renting will be fast and straightforward: Up to five minutes before departure, registered customers can book their Golf on the internet, via a call center or using an app. The hand-over of the car is then a matter of seconds. The customer opens the car with a chip, authorizes with a PIN number via the touch screen – and the journey can begin.



Available to be rented in Hanover soon: the Golf BlueMotion.

# Taxi!

## Mobility for Every Occasion

### Taxis of the Future

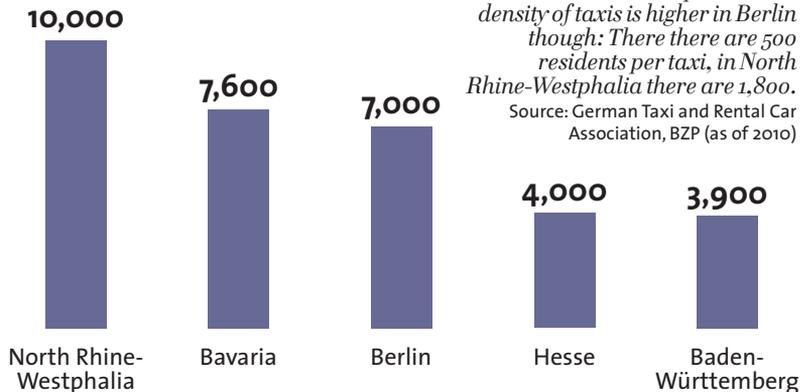


As of this summer, there are taxis driving without a driver in the CO<sub>2</sub>-free model city of Masdar in Abu Dhabi. The travel destination is entered with the push of a button and the road network of these taxis is below ground level. Currently there are only ten taxis on a test run but their number is planned to increase to 3,000. In order to ensure frictionless traffic between the 85 planned stations, sensors monitor the taxis' movements over the tarmac and the vehicles communicate via WIFI.

Sources: Spiegel Online; 2getthere (both as of 2011)

The taxi connects: It brings teenagers home from a party, old people to the doctor, and businessmen to the airport. Taxis operate in all countries, currently there are around 50,000 in Germany. While the taxi business in Germany is regulated, there are non-registered taxis in some other countries. According to estimates, there are up to 130,000 taxis in a single city, for example in Mexico City.

### Top five – Taxis per federal state:



One fifth of all German taxis drive in North Rhine-Westphalia. The density of taxis is higher in Berlin though: There are 500 residents per taxi, in North Rhine-Westphalia there are 1,800. Source: German Taxi and Rental Car Association, BZP (as of 2010)

### Price of taxis per kilometer:\*

(in euros)



Taking a taxi does not cost the same everywhere in Germany: It is cheapest in Leipzig and most expensive in Hamburg. In the latter, when making a ten kilometer trip, one pays an additional 1.75 euros on top of the customary basic charge of 2.70 euros per kilometer.

Source: German Taxi and Rental Car Association, BZP (as of 2010)

\* For distances up to ten kilometers.

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