# Predicted benefits of the driverless car

## Aspiration

### 90% reduction in accidents

- 4.95 million fewer accidents
- 30,000 fewer deaths
- 2 million fewer injuries
- $400 billion in accident-related cost savings

## Potential Annual Benefits (US only)

### 90% reduction wasted commuting

- 4.8 billion fewer commuting hours
- 1.9 billion gallons in fuel savings
- $101 billion saved in lost productivity and fuel costs

### 90% reduction in cars

- Reduce cost per trip-mile by 80% or more
- Increase car utilization from 5-10% to 75% or more
- Better land use

Source: Forbes, Google, US NHTSA, AAA, Texas A&M Transportation Institute, Columbia University Earth Institute and Devil’s Advocate Group’s analysis.
Various facets and forces that must come together to enable self-driving

Source: KPMG, Center for Automotive Research.
57% of consumers globally trust driverless cars

More so in emerging markets

Personal travel costs can be dramatically reduced

Cost Per Trip-Mile

<table>
<thead>
<tr>
<th></th>
<th>10000 mi/yr</th>
<th>15000 mi/yr</th>
<th>Shared Driverless Vehicles</th>
<th>Shared Driverless Purpose-Built Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personally Owned Vehicle</td>
<td>$0.55</td>
<td>$0.39</td>
<td>$0.22</td>
<td>$0.07</td>
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<tr>
<td>Reduced Ownership Cost</td>
<td>$0.20</td>
<td>$0.20</td>
<td>$0.19</td>
<td>$0.08</td>
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</tbody>
</table>

Source: Forbes, Program on Sustainable Mobility, the Earth Institute, Columbia University.
A Toyota Prius modified by Google to operate as a driverless car.

Source: Wikimedia Commons.
Nissan autonomous prototype technology was fitted on the Nissan Leaf all electric car

Source: Wikimedia Commons.
Robotic Volkswagen Passat, at Stanford University

October 2009

Source: Wikimedia Commons.
Timeline for movements toward autonomous cars

- Late 2014, Volvo will feature Adaptive Cruise Control with steer assist which will automatically follow the vehicle ahead in queues.
- By 2015, Audi plans to market vehicles that can autonomously steer, accelerate and brake at lower speeds, such as in traffic jams.
- By 2015, Cadillac plans vehicles with "super cruise": autonomous steering, braking and lane guidance. This technology will likely spread to other GM models in following years.
- By 2015, Nissan expects to sell vehicles with autonomous steering, braking, lane guidance, throttle, gear shifting, and, as permitted by law, unoccupied self-parking after passengers exit.
- By Mid-2010's, Toyota plans to roll out near-autonomous vehicles dubbed Automated Highway Driving Assist with Lane Trace Control and Cooperative-adaptive Cruise Control.
- January 1, 2017 The National Highway Traffic Safety Administration hopes to mandate the adoption of Vehicle-to-Vehicle technology on all new automobiles.

At the 2012 CA bill signing Google co-founder Sergey Brin said "you can count on one hand the number of years until ordinary people can experience this (autonomous car technology)."

By 2017, Tesla plans an "autopilot" feature that handles 90% of miles driven.

By 2020, Volvo envisages having cars in which passengers would be immune from injuries.

By 2020, GM, Mercedes-Benz, Audi, Nissan, BMW and Renault all expect to sell vehicles that can drive themselves at least part of the time.

By 2025, Daimler and Ford expect autonomous vehicles on the market.

In 2035, IHS Automotive report says will be the year most self-driving vehicles will be operated completely independent from a human occupant’s control.