Automated Vehicles and Public Perception

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I want a faster horse...
Vehicles with Blind Spot Monitoring scored higher in APEAL than those that did not have the feature.

| Source: J.D. Power 2015 U.S. APEAL Study |
Vision assistance systems rate high for desirability and usage in vehicles today and are preferred on consumer’s next purchase.

Respondents are consistently demonstrating their desire for assistance while driving as supported by J.D. Power’s DrIVE 1st Gear and also Tech Choice, in which Blind Spot Detection and Prevention was the most preferred technology, even at a price of $750.
Collision Protection Preference (MaxDiff Score)
Auto braking & steering common theme

Blind Spot Detection and Prevention System $750 225
Night Vision $3000 185
Camera Rear-View Mirror $300 178
Enhanced Collision Mitigation System $750 174
Emergency Braking and Steering System $800 153
Reverse Auto Braking $350 148
Self-Healing Paint $500 141
Remote Vehicle Diagnostics $250 140
Pedestrian and Cyclist Detection $750 138
Auto Lane Keeping $300 136
Camera Side-View Mirrors $400 136
Smart Headlights $1500 135
Drowsiness Detection System $500 134
Electronic Window Tint Adjustment $750 128
Driver Distraction Protection $800 126
Enhanced Adaptive Cruise Control $750 124
Fully Autonomous Parking System $400 122
Medical Emergency Stop $1000 117
Laser headlights $2200 112
Predictive Traffic $150 112
Auto Lane Change $1500 109
Smart Parking $100 107
Simple Wireless Device Connection $40 105
Smartphone Navigation Vehicle Interface $100 103
Full Self-Driving Automation $3000 102
Underbody Air Bags $1900 102
Vehicle Body Control System $3000 99
Active Shutter Grille Vents $150 97
Curve Approach Control $750 95
Limited Self-Driving Automation $2500 92
Active Wheel Shutters $150 88
Traffic Jam Assist $800 88
Naturalistic Guidance $100 85
Augmented Reality Windshield $2000 84
Traffic Sign Recognition System $500 83
Near Field Communication $200 82
Text to Speech $175 82
Mobile Router $450 81
Gesture Activated Doors $400 81
Automatic Brake Hold $100 79
Wireless Infotainment System Updates $75 76
Solar Glass Roof $2000 76
Biometric Recognition $1200 75
Eye Tracking Controls $1200 72
Google's Android Auto Suite $400 70
Dashcam $300 68
New Driver Monitoring $400 67
Predictive Vehicle Assistant $1000 66
Apple's Carplay Suite $400 65
Energy Recovery Suspension $2200 63
Passenger Control System $1500 59
Hidden Door Handles $750 59
Trailer Connect Assist $300 56
Biometric Driving Sensors $750 55
Hand Gesture Controlled Seat $200 54
Hand Gesture Controlled Cockpit $1000 54
Email Integration $100 53
Health and Wellness System $100 51
Haptic Touch Screen $1300 51

Source: J.D. Power 2015 U.S. Tech Choice Study
Consumer Shift Toward Collision Protection Technologies

- In-vehicle experience
- Driver distraction
- Value add benefit
- Cost (in a world of “free”)
- Occupant and vehicle safety
- Ready for “help”
- Long term benefits
- Enabler

Source: J.D. Power 2015 U.S. Tech Choice Study
Who wants a Collision Protection Avoidance Technology on their next vehicle?

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Interest by Age</th>
<th>2025</th>
<th>2025 Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation Y</td>
<td>87%</td>
<td>$89k</td>
<td></td>
</tr>
<tr>
<td>Generation X</td>
<td>79%</td>
<td>$108k</td>
<td></td>
</tr>
<tr>
<td>Boomers</td>
<td>76%</td>
<td>$123k</td>
<td></td>
</tr>
<tr>
<td>Pre-Boomers</td>
<td>81%</td>
<td>$97k</td>
<td></td>
</tr>
</tbody>
</table>

Source: J.D. Power 2015 U.S. Tech Choice Study
As the industry builds toward the future where Self-Driving vehicles are a reality, it is important to understand how different technologies will influence that movement and what consumers think of those technologies as we move forward toward acceptance.
On the Road to Self-Driving Vehicles

Generations differ in their preference for these technologies

Preference (MaxDiff Score) by Generation

- Traffic Jam Assist
- Limited Self-Driving
- Full Self-Driving

Gen Y and Gen X seem to prefer the more complex and advanced Self-Driving technologies that can handle all or some of the driving, while the older generations prefer to ease into full Self-Driving showing higher preference for Traffic Jam Assist than the younger generations.

Source: J.D. Power 2015 U.S. Tech Choice Study
Two sides of the coin—There is still work to do

"The potential of self driving cars is awesome."

"Instead of spending time fuming at the wheel, 'drivers' would be free to get on with work or watch a film."

"GIMME A SELF DRIVING CAR NOAW !!!!! No more traffic jams, sleeping in the car!"

"Self driving cars are an awesome idea. Think about it; it can drive to where you are - so the car can do all the dull things like finding a parking space for you."

"Smart cars for drunk drivers! Let's take drunk drivers off the roads and safely home in smart cars."

"Google's self-driving car is already better than most drivers. If they can figure out winter driving, there's nothing stopping them."

"Self-driving cars are pretty baller. One thing I've always wondered is what happens if the software fails and your car hits something, who would be at fault?"

"I think that a possible problem with self-driving cars is that if the software crashes, so do you."

"A self driving car is a great idea. A self driving car without manual override, not so much."

"Driving is such a fun experience why do people want self driving cars?"

"This is part of the future that I would resist, even though I see the benefits. The cars are safer, more economical, more energy efficient. They also look absurd, take control away from the individual, limit freedom, and only resemble an "automobile" in the most basic functional sense."

Source: J.D. Power 2015 U.S. Tech Choice Study Social Media Analysis
Redefinition of Quality

Traditional Quality
- Warranty Cases
- Malfunctions not brought to warranty

Consumer Quality
- Warranty Cases
- Malfunctions not brought to warranty
- Soft “Inadequacies” needs addressed but not as preferred
- Missed Opportunities vehicle misalignment with market expectations

Design Quality

Consumer Behavior

Source: J.D. Power 1987 through 2015 U.S. Initial Quality Study (IQS)
While consumers are finding this technology helpful, only 39% reported that the dealer explained the feature to them. Further, false positives and false negatives are risk factors that can erode trust in the system.

“Sometimes the system fails to detect a car in my blind spot. There are also a lot of false positives when I’m driving next to a barrier or in a double turn lane (but the double lane one is unavoidable).”

“Alerts when nothing is nearby.”

“Not even sure if I have it or not.”

“Took me 6 weeks to even know how to use. The factory default was set to off!!! And the dealer didn’t explain the feature to me.”

Helpfulness of Blind Spot Warning and Detection

Source: 2015 J.D. Power Drive 1st Gear Study
Evolution of Consumer Quality Pyramid

Trust Issues Arise

Traditional Quality

Consumer Quality

Evolution of Consumer Quality

Comfort level: accuracy, vehicle behavior matches expectation, communication language, no surprises

Source: J.D. Power 1987 through 2015 U.S. Initial Quality Study (IQS) and 2015 U.S. DrIVE 1st Gear Study
Thank You