

# CRASH COURSE 2015

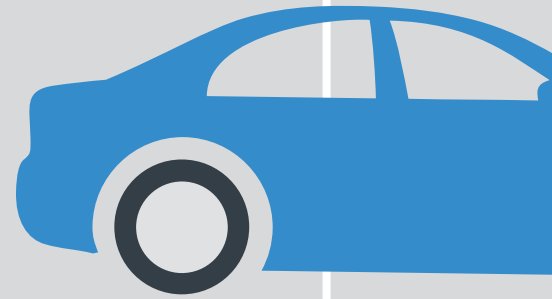
## smart connections



consumer

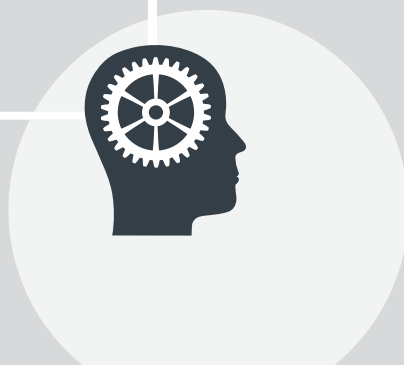


car



carrier

repairer



## The New Normal—Back to the Future



***Roads? Where we're going, we don't need roads.***

—Dr. Emmett Brown, *Back to the Future 2*

Movie buffs will know the answer to this: what year was the 'future' in the movie "Back to the Future II"? We're in it! The year was 2015 and 'back to the future' may be an appropriate way to summarize this moment in time. How so?

Most economists agree that the U.S. has rebounded from the Great Recession. Recovery was slow, but we're finally moving forward. And, when we look at the automotive claims and collision repair industries there are many factors to suggest that we've returned to a healthier market as well. Although, today's industry is dramatically different than in 2007, with many of the futuristic technologies once only seen in movies actually available in our daily lives.

### **The World Has Gone Digital.**

A preview of the products featured at two major events in January 2015 – the Consumer Electronics Show in Las Vegas and the Detroit Auto Show, illustrate how digital technology has gone mainstream - think 'connected cars, connected homes, connected people, connected devices, connected intelligence.' Digital technology is entering nearly every sphere of our lives, and to borrow the phrase from the well-recognized investor and entrepreneur Marc Andreessen in a Wall Street Journal op-ed in 2011 - "All companies are now software companies."<sup>1</sup> Software is replacing or revolutionizing everything that used to be done with physical stuff.<sup>2</sup> Even the Girl Scouts have gone digital: Girl Scout cookies can now be purchased online, and fans can download the "Official Girl Scout Cookie Finder" app.<sup>3</sup>

Mobile technology and the ability to connect to anything or anyone at any given moment has created 'amped-up' expectations among consumers. It's also created vast stores of consumer data - behaviors, preferences, and so much more. Consumers know data is being collected about them, and subsequently, anticipate that companies will use that information securely and effectively to provide greater speed, greater personalization, and unique products. And, often, this is exactly the case; except when it's not.

In 2015, the most significant data breaches involving consumer information were reported, putting the topic of data privacy and cybersecurity front and center for businesses, the government and consumers alike. Elevating information security and data privacy as a business imperative is certain and the call for transparency is sure.

Thanks to the Internet of Things, and digitally connected vehicles, even more data is being generated about us – how and where we drive and multi-task while on the road. How much more will we be able to do while in our cars? Who will be able to get access to our driving behaviors and who owns all of that data anyway? These are all questions being discussed today.

These ultra-connected, high-tech and structurally sophisticated vehicles are also changing the landscape for insurers and collision repairers. Greater vehicle complexity from lightweight materials, complex construction, sensors and cameras create complexity in the repair process, which requires access to information on how to properly repair the vehicle, as well as the equipment, tools and training need to complete accurate repairs. This dynamic means that capital or line-item investments must be made at a time when the long-term trend point to a slowly but surely shrinking market, thanks to broad demographic factors and burgeoning crash avoidance technology.

Some key performance indicators for our industry – repair costs, total loss values and labor costs – all seem to be back in line with pre-recession levels or moderating. And the growing use of technology is impacting every corner of our industry from vehicle design to customer satisfaction and self-service strategies to more intelligent and touchless claims processing. Futuristic stuff indeed.

It's great to be back from where we've been, but the future – while exciting, leaves a lot of unanswered questions. One thing is for certain, to survive in this new hyper-connected world – companies must engage all of the tools at their disposal – think analytics, mobile, cloud, and social, to achieve the speed, transparency and creativity that your business and your customers demand.

FIG.1

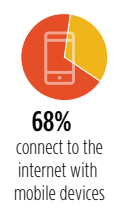
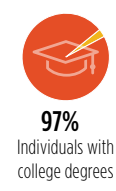
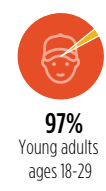
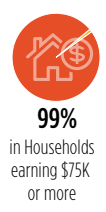
# "The Web at 25"

Statistics from Pew Research Internet Project

## American Internet Use



87% of American adults that use the internet



## We're Back – But It's a New Normal

Every day the news brings stories of how new technologies are moving into the mainstream, whether that be drones, self-driving or even flying vehicles, wearable technology, and even virtual reality. A primary focus of the technology we see being introduced today is "connecting virtual and physical worlds."<sup>4</sup>

In 2014, the World Wide Web turned 25. What began as a data-transfer system has become a mass-adopted technology, that when coupled with the emergence of mobile connectivity has dramatically changed our world.<sup>5</sup> The Pew Research Center has tracked its emergence and the impacts on "...the way people get, share, and create news; the way they take care of their health; the way they perform their jobs; the way they learn; the nature of their political activity; their interactions with government; the style and scope of their communications with friends and family; and the way they organize in communities."<sup>6</sup> Underscoring its growth, here are some stats from the Pew Research Internet Project (*see Figure 1*).

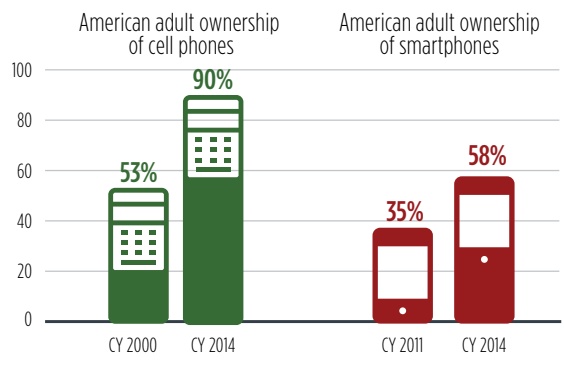
Last year in *Crash Course* we discussed the emergence of IoT – the Internet of Things. In 2015 IoT has arrived. A recent article in the publication *strategy+business* calls the arrival of IoT a "transformative shift for the economy" that incorporates cloud computing, data analytics, and mobile communications, and more.<sup>7</sup> As consumers incorporate more IoT devices into their daily lives, whether that be something like a FitBit, or NEST thermostat, they will become ever more comfortable with the collection of their data, particularly if it helps lead to a better product experience.

So what does all of this mean to our industry? Digital technology has gone mainstream - think 'connected cars, connected homes, connected people, connected devices, connected intelligence.' This hyper-connectivity changes the speed of everyday interactions and experiences, which must be addressed by businesses interested in meeting the expectations of consumers.

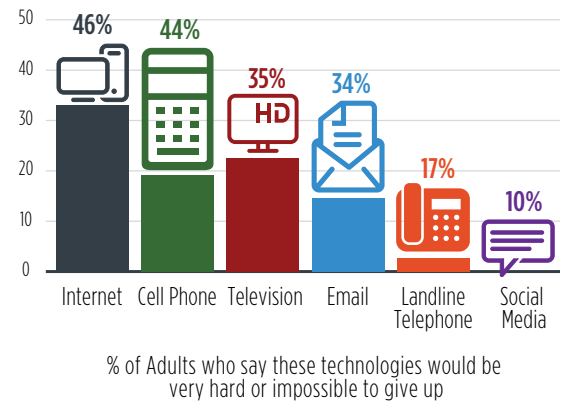
Digital technology is also contributing to a new demographic and economic landscape, which the automotive claims and collision repair industry must acknowledge and respond to with changes to, or development of, new products and services.

Let's start with where we are heading in 2015 from an overall economic growth perspective...

## Adoption of Mobile Technology



## Technologies that would be very hard to give up



Source: Susannah Fox and Lee Rainie. Pew Research Internet Project. "The Web at 25 in the U.S." February 27, 2014, www.pewinternet.org.

## Our Economy

The U.S. economy officially left the Great Recession behind in June of 2009. Quarterly growth since then has been volatile, but full year growth averaged just over two percent between CY 2010 and 2013.<sup>8</sup> Despite negative growth in first quarter 2014, it appears the U.S. is finally ramping up its recovery: third quarter growth was 5 percent, fourth quarter growth was 2.6 percent, and full year growth was 2.4 percent versus 2.2 percent in 2013 (*see Figure 2*).<sup>9</sup> Perhaps most telling is the fact that the U.S. GDP averaged growth of 2.4 percent since the 2009 trough and is now 12.9 percent higher.

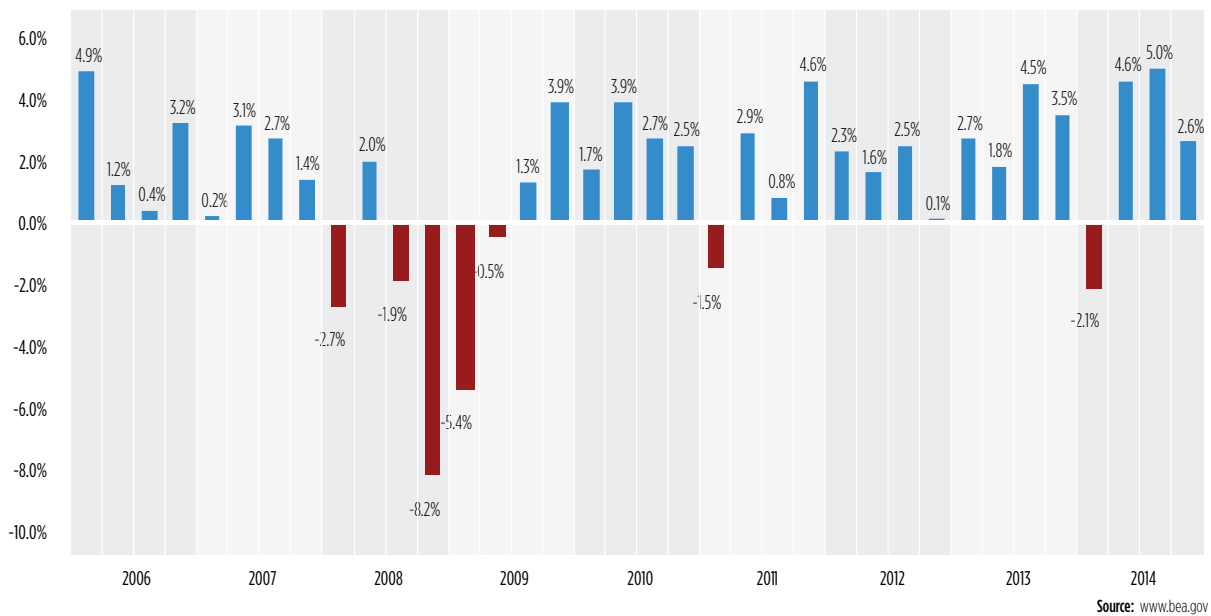
Growth outside the U.S. however does not look as good, and has prompted economists to project both good and bad news for the U.S. economy in 2015 and beyond. On January 13, 2015, the World Bank revised its prediction for 2015 global growth from 3.4 percent to just 3 percent.<sup>10</sup> Deloitte's *United States Economic Forecast* describes four potential economic outcomes, with estimates for growth in 2015 ranging from 0.3 percent (where

U.S. is dragged back into a recession) to 3.9 percent (where the U.S. is part of a coordinated global recovery).<sup>11</sup> The most likely scenario results in growth of between 3 percent and 3.5 percent in 2015, driven by improved labor markets and business investment and greater consumer demand for goods and services here in the U.S. and abroad.<sup>12</sup> This would be the strongest rate of growth in a decade.

There has been much discussion on the growing disparity of income in the U.S. Numerous government agencies and economists have presented analyses illustrating most of the wealth regained during the recovery has gone to the wealthy. For example, a recent study completed by economist Emmanuel Saez showed that after adjusting for inflation, the average income for the richest 1 percent (excluding capital gains) rose from \$871,100 in 2009 to \$968,000 over 2012 and 2013. By contrast, for the remaining 99 percent, average incomes fell by a few dollars from \$44,000 to \$43,900.<sup>13</sup>

### FIG. 2 U.S. Percent Change from Preceding Period in Real Gross Domestic Product

Seasonally adjusted at annual rates



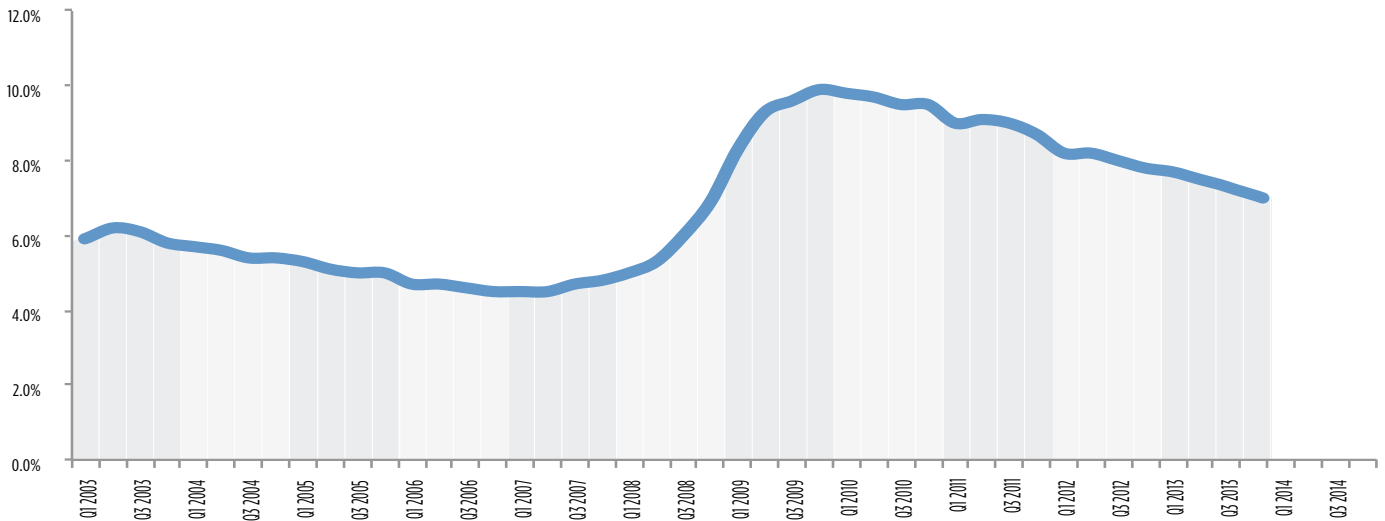
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With income essentially flat for most individuals in the U.S., companies can expect consumers to be increasingly focused on value for money spent. Digital technology will enable consumers to search efficiently for competitive products and pricing, and also be what is sought after most by consumers whose appetites for all things digital shows no signs of waning.

FIG. 3

# U.S. Unemployment Rate Q1 2003 - Q4 2014

Source: U.S. Bureau of Labor Statistics



## More are Back to Work

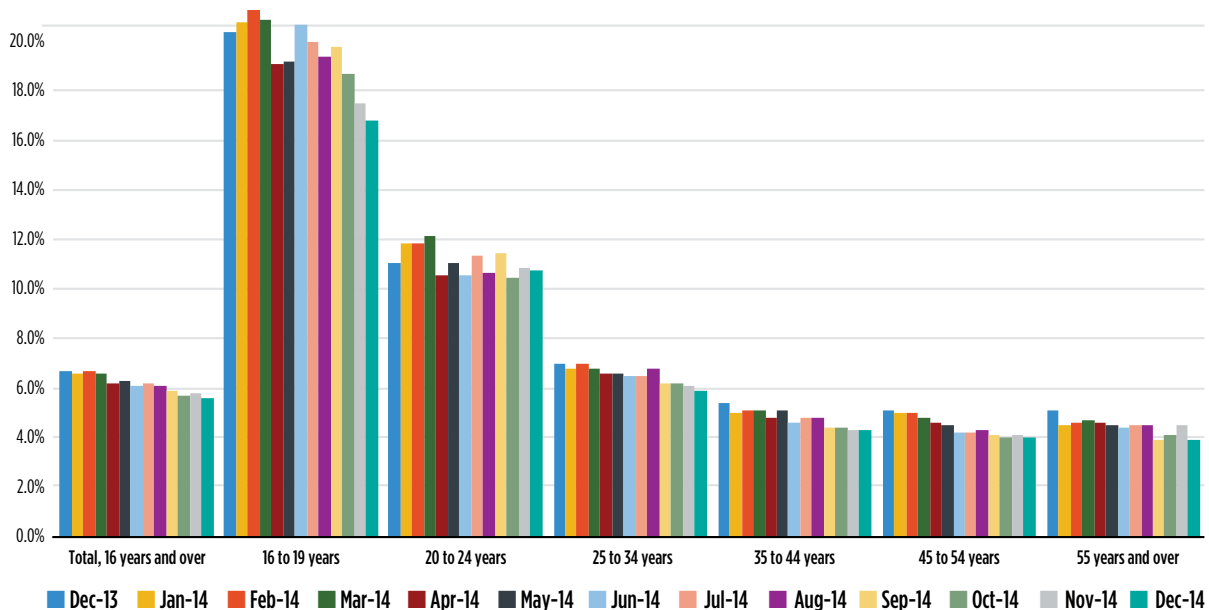
The overall unemployment rate for the U.S. fell to 5.6 percent in December 2014 from 7.4 percent in CY 2013 and 8.1 percent for all of 2012 (see Figure 3). In 2014, job growth averaged 246,000 per month, compared with an average monthly gain of 194,000 in 2013.

Unfortunately the civilian labor force participation rate continued to edge down by 0.2 percentage point to 62.7 percent in Dec. 2014. Since April, the participation rate has remained within a narrow range of 62.7 to 62.9 percent. This is still the lowest this figure has been since 1978 - and although this number increased to just over 63% by March of 2014, the level is still historically low. Some of the decline in the labor participation rate is the result of an aging population and rising retirements, although the rate for workers aged 45 to 54 is still the lowest since 1988. And while unemployment numbers have improved across all age groups, rates for the younger age brackets remain higher than those in the older age brackets (see Figure 4).<sup>14</sup>

FIG. 4

## Unemployment rate by age, seasonally adjusted Dec '13-Dec '14

U.S. Bureau of Labor Statistics



## Millennials Growing in Number and Economic Stature

In prior issues of *Crash Course*, there has been much discussion on the differences in behavior and expectations of the first truly digital generation - the Millennials.

The Pew Research Center projects Millennials in 2015 will officially become the largest segment of the U.S. population.<sup>15</sup> Much of the growth has come from an influx of people coming to the U.S. from other countries.

The Millennial Generation is the best-educated cohort of young adults in America, but two-thirds of those graduating with a bachelor's degree have loans averaging \$27,000.<sup>16</sup> According to Pew Research, the average outstanding loan balance was only \$15,000 twenty years ago, and only half of those graduating had outstanding loans.<sup>17</sup> Student debt is one of several factors the Pew Research Center cites to explain why Millennials are the first generation in the modern era to have higher poverty and unemployment and lower levels of wealth and personal income than either Generation X or Baby Boomers.<sup>18</sup>

In 2012, 36 percent of Americans aged 18-31 were living in their parents' homes, up from 32 percent in 2007.<sup>19</sup> Improving employment should help these young people start to move out, leading to more opportunity for insurers to provide rental or homeowner's coverage, and potentially auto coverage as well if the move-out includes a purchase of a vehicle. Relatively inexpensive cost of housing in the U.S. should also help – the ratio

of house prices to average incomes is up slightly, but is still below its peak in 2006.<sup>20</sup> Worth noting is that 69 percent of unmarried Millennials have said they would like to be married according to Pew Center Research, but have not felt their finances were strong enough.<sup>21</sup> Perhaps as their economic situations improve, we may see some reversal to the decline in marriage rates: as of 2013 only 26 percent of individuals aged 18 to 32 were married versus 65 percent of the Silent Generation and 48 percent of the Baby Boomers when they were at a comparable age.<sup>22</sup>

Economics appear to be a key factor in lower vehicle ownership rates among Millennials as well. A study conducted by MTV in the spring of 2014 – “Millennials Have Drive”, looks at five ‘myths’ regarding Millennials attitudes on vehicle ownership, and found Millennials seem to be just as interested in vehicle ownership as other generations had been at their age.<sup>23</sup> Results from the study concluded the following: driving is still the number one choice among transportation options; graduated teen licensing programs have slowed licensing rates; 70 percent of Millennials surveyed said they enjoyed driving; 8 in 10 surveyed said a vehicle is the one primary big ticket item purchased by people their age; and Millennials view autos as necessary to their social connections as their smartphones.<sup>24</sup> This data is consistent with the results of a survey “The Changing Nature of Mobility” conducted by Deloitte that showed the top three reasons why Millennials did not own a vehicle were affordability, maintenance costs, and lifestyle needs met by walking/public transportation.<sup>25</sup>

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Historically as people have moved out on their own, many have married and started families – all major life events that often included the purchase of a new vehicle. Millennials, saddled with debt, but now seeing improved employment, may soon embark on a similar path. If so, this will drive vehicle sales in the U.S., and as a by-product drive the need for auto insurance. With this being the first generation to truly grow up ‘digital’ however, expect the manner in which they walk that same path to be different in terms of what they expect and how they shop.

## Becoming More Alike than Different

While Millennials have been perhaps the most-talked about generation in the last several years, they like all other generations have gotten older. The U.S. is seeing its population get older – by 2050 the median age in the U.S. is expected to be 41 years versus 37 in 2010.<sup>26</sup>

And while the Millennials are starting to more closely follow in the footsteps of prior generations (although at a delayed pace), there is more data that suggests the older generations' use of digital technology is starting to look like that of the Millennials.

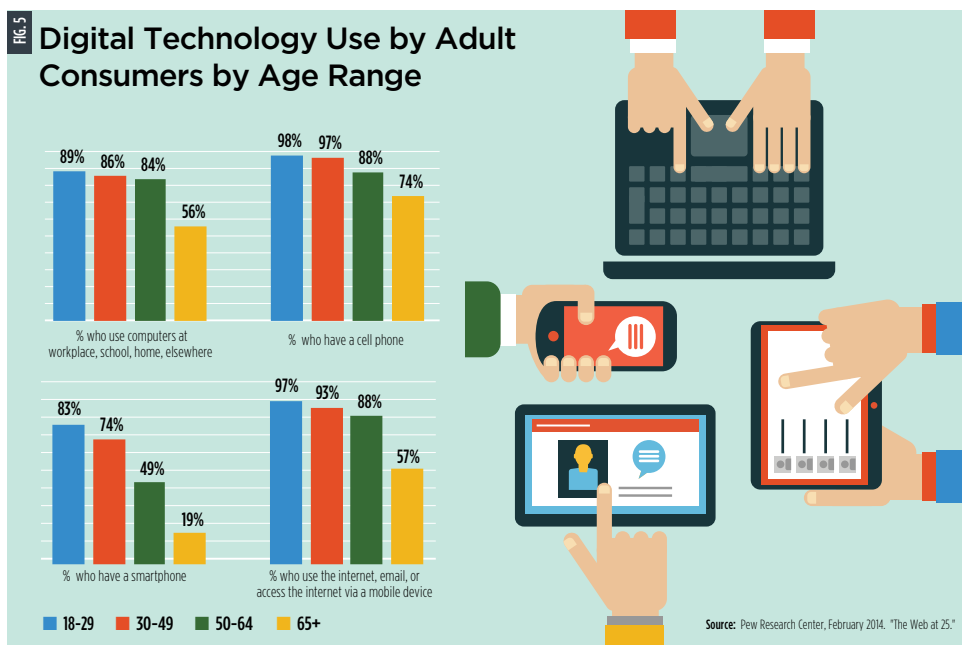
Trendwatching.com calls this “Post-Demographic Consumerism.” Their study cites numerous illustrative statistics and examples where companies are developing products or services that are reaching across numerous demographics.<sup>27</sup> For example, a study commissioned by the Internet Advertising Bureau found that in the U.K. there are now more people over 44 years of age playing video games than children or teenagers.<sup>28</sup> Much of that growth has occurred as smartphone adoption has grown, with 54 percent of those surveyed citing the phone as their favorite gaming platform.<sup>29</sup>

Numerous statistics have been published which show some of the most rapid growth in adoption of social media sites like Facebook and Twitter is occurring among older generations. For example, Twitter saw 79 percent growth from 2012 to 2013 for users aged 55-64<sup>30</sup>, and Facebook saw 80 percent growth in users aged 55-plus between 2011 and 2014.<sup>31</sup>

Data from the Pew Research Center's "The Web at 25" report illustrates the shrinking difference in usage of computers, internet, smartphones, etc. among the youngest and oldest adults in the U.S. (see Figure 5).<sup>32</sup>

An estimated 8 million Americans aged 50-plus go online every month to find information on buying a car, a figure that has

increased 45 percent in the last five years according to data published in a study released by AARP in 2014.<sup>33</sup> With over 60 percent of all new vehicles in the U.S. purchased by individuals aged 50-years-plus, and an average of 5 vehicle purchases made after an individual turns 50, this is an extremely critical demographic for automakers and insurers.<sup>34</sup> So while marketing must be designed to address the needs and desires of different demographics, the growing use of digital technology among all age groups points to a common need to ensure your marketing is being delivered on the right device, with the right personalization, at the right time.



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Adoption of digital technology has grown across all age groups and demographics. All customers now have expectations that the technology they use can also be used by the companies with which they do business to connect with them, gather customer feedback, and adapt their products and services to facilitate their interactions with them.

**How Low Will it Go?**

Gasoline prices fell more than \$1.40 per gallon in CY 2014 from a peak in June to just over \$2.20 per gallon at the close of December. Oil prices have fallen consecutively for 6 months, with the \$62 per barrel price in December 2014 marking the lowest price since May 2009. Expanded oil production within the U.S. from the shale gas boom, along with strong global supply and weakening outlooks for the global economy are the primary factors.<sup>35</sup>

There remains a great deal of uncertainty about just how low the cost of oil will go. The U.S. Energy Information Administration (EIA) forecasts that Brent crude oil prices will average \$58/bbl in 2015 and \$75/bbl in 2016, although the 95 percent confidence interval for market expectations grows sharply over time – with lower and upper limits of \$28 and \$112 for prices in December 2015.<sup>36</sup> Resulting projections for gasoline prices are \$2.33 per gallon in 2015 (down from the average of \$3.36 in 2014), and \$2.72 per gallon in 2016.<sup>37</sup> With gas prices this low, each U.S. household is expected to spend on average \$750 less for gasoline in 2015 than in 2014.<sup>38</sup>

Many studies have been published that examine the correlation of miles driven to gasoline prices.<sup>39</sup> The premise is that people drive more, and at faster rates, when gas prices are lower; people are also less likely to use public transportation. Other studies have looked at demographic differences and found gasoline price increases have a higher impact on younger drivers – due in large part to the economic position of young people.<sup>40</sup> Additionally, the short term effects of gasoline prices on traffic crashes have been studied and were found to be generally stronger than the delayed effects.<sup>41</sup>



## How Low Will it Go? (cont'd)

One study conducted by a group of statisticians looked specifically at how the role of gasoline prices in the occurrence of traffic crashes differs between urban and rural areas. Using traffic crash data from 1998 to 2007 at the county level in Minnesota, this study identified that gasoline price effects on total crashes, property-damage-only crashes, and injury crashes are stronger in rural areas than urban areas (see Figure 6).<sup>42</sup> Among the theories concluded but not statistically tested in the study was that lower incomes among rural commuters made them more sensitive to rising gas prices.<sup>43</sup>

## Miles Driven are Truckin' Again

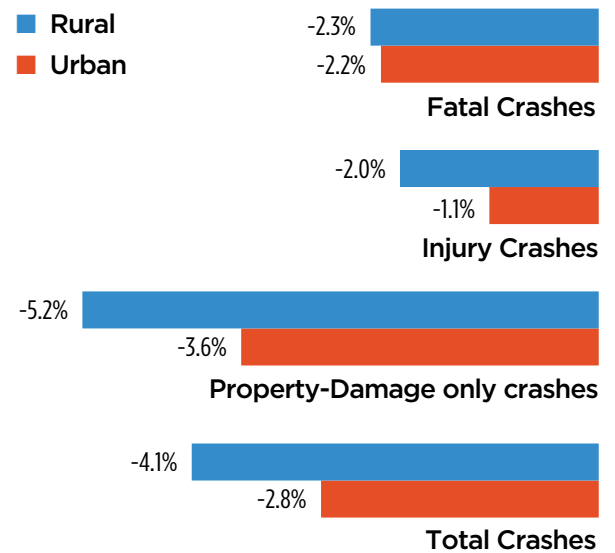
In *Crash Course 2014* data points from numerous studies pointed to a peak in miles driven in the U.S. that occurred before the last recession (see Figure 7). Miles driven per month in the U.S. grew at an average rate of 2.1 percent compared with the same month from the prior year from 1990 to 2007. During the worst of the recession and the period immediately following (2008 to 2010), miles driven showed a year-over-year decline each month of 0.8 percent. Finally, monthly year-over-year growth between 2011 and 2014 has averaged 0.2 percent.<sup>44</sup> And for the full year 2014, miles driven in the U.S. exceeded the peak miles driven for every year back to 2007 (see Figure 8). A stronger U.S. economy is one key factor contributing to the increase in miles driven.

Among the factors driving overall miles driven in the U.S. is the increase in online shopping, which has increased freight traffic for the trucking industry. Data from AlixPartners shows a 19 percent compound annual growth rate in e-commerce between 2000 and 2013, and a 45 percent increase in the average number of annual orders made online.<sup>45</sup> The American Trucking Association predicts U.S. freight tonnage will rise nearly 25 percent by 2025. According to IHS Global Insight, total truck tonnage hit 9.68 billion tons in 2013, the highest level since 2008.<sup>46</sup>

FIG. 6

## Reduction in Urban and Rural Crashes for a 10% Increase in Gasoline Prices

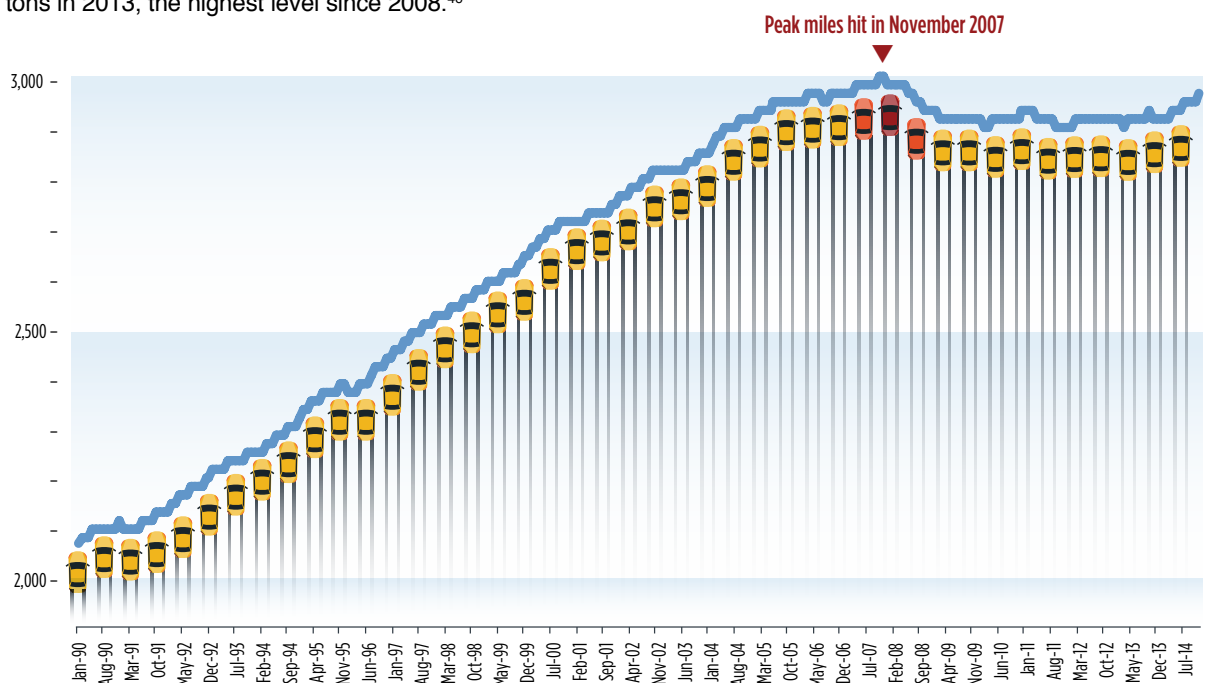
based on MN traffic crash data 1998-2007



Source: Guangqing Chi, Mohammed A. Quddus, Arthur Huang, David Levinson. "Gasoline price effects on traffic safety in urban and rural areas: Evidence from Minnesota, 1998-2007." *Safety Science* 59 (2013) 154-162.

FIG. 7

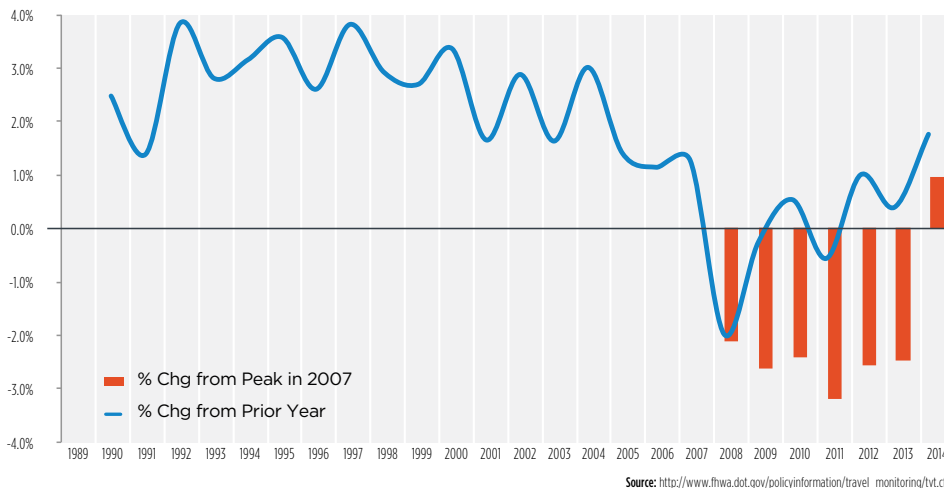
## U.S. Annual Vehicle-Distance Traveled Billion of Miles



Source: [http://www.thwa.dot.gov/policyinformation/travel\\_monitoring/tvt.cfm](http://www.thwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm).



**FIG. 8 Percent Change by Calendar Year in U.S. Travel—All Roads and Streets**  
in Millions of Vehicle Miles U.S. DOT FHWA

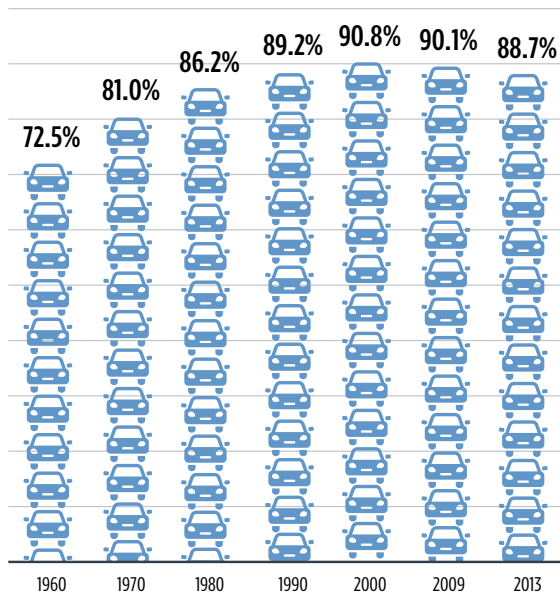


**Miles Driven are Truckin' Again (cont'd)**

Better employment numbers mean more people are headed to work each day. In the U.S. nearly 90 percent of individuals that commute to work still use a vehicle<sup>47</sup>; with 76 percent of those commuters driving alone<sup>48</sup> (see Figure 9). That number has fallen from a peak in 2000 in part due to growing urbanization, increased use of public transportation (measured via transit ridership)<sup>49</sup>, more people working from home (see Figure 10), and more options today such as car-sharing programs.<sup>50</sup>

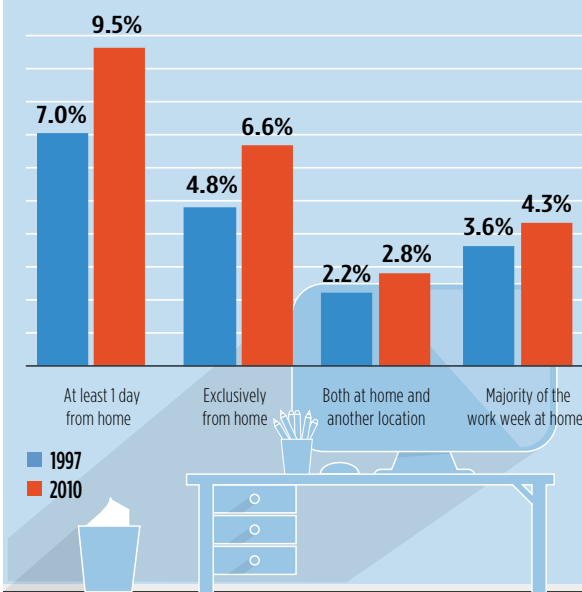
A drop in new vehicle sales during the recession helps explain in part the increase in the percent of U.S. households without a vehicle from 8.87 percent in 2007 to 9.29 percent in 2011. With the resurgence in new vehicle sales in the U.S., that figure moved back down to 9.09 percent by 2013.<sup>51</sup>

**FIG. 9 Vehicles still used as primary means for commuting**



Source: Winston, Clifford. "On the Performance of the U.S. Transportation System: Caution Ahead." Journal of Economic Literature 2013, 51(3), 773-824.

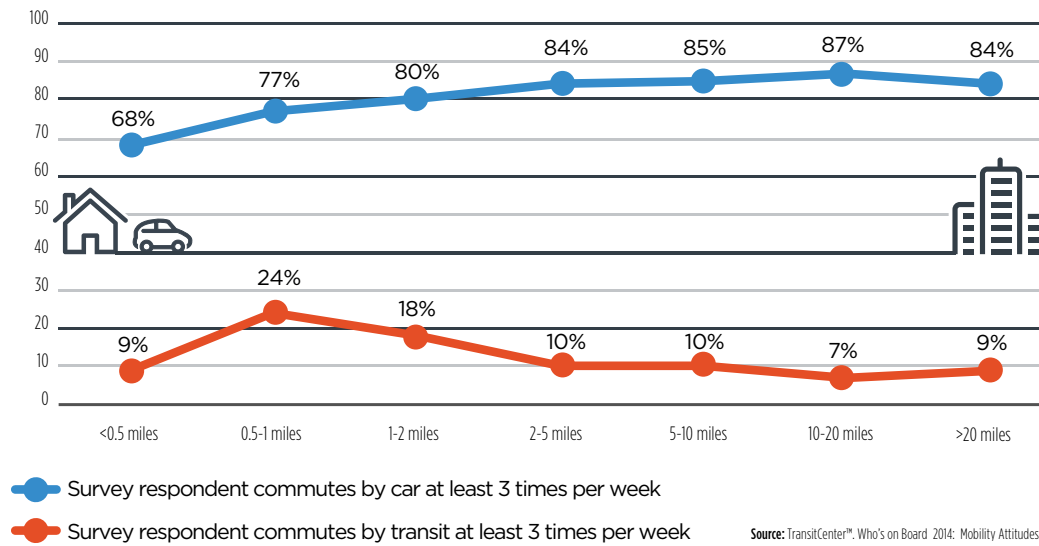
**FIG. 10 Home-Based Workers in the U.S. by work arrangement**  
U.S. Census Bureau



Source: U.S. Census Bureau. "Home-Based Workers in the United States: 2010." <http://www.census.gov/prod/2012pubs/p70-132.pdf>

FIG. 11

## Auto and Transit Commuting by Distance to Work



### Miles Driven are Truckin' Again (cont'd)

A number of studies have been completed and discussed in prior issues of *Crash Course* that point to a greater willingness among Millennials to use alternative methods of transportation. Data from a survey commissioned by TransitCenter in 2014 concluded that distance to work was the best predictor of commuting choice; with those commuting 0.5 to 2.0 miles the most likely to use public transportation, and car commuting rising as distance to/from work increased (see Figure 11).<sup>52</sup> They also found that consumers of all ages have a desire to live in mixed-use, walkable neighborhoods than actually do. 2010 Census data showed more growth in metro areas in the ten years prior than non-metro areas. If this trend continues, this may mean more individuals would have shorter commutes and may be more likely to take public transportation.

In their 2014 Annual Energy Outlook, the U.S. Energy Information Administration projects the number of licensed drivers in the U.S.

will grow on average by 0.8 percent per year from 2012 to 2040, but structural changes in travel patterns and employment rates by driver age may result in flat to declining vehicle miles traveled per licensed driver through 2040.<sup>53</sup> This report also predicts the average number of vehicles per licensed driver in the U.S. will drop from 1.12 in 2007 to 1.02 by 2040.

Additionally, a study of households located in major U.S. cities with two or more vehicles suggests that if further shifts to metro areas occur, there may be a reduction in the national average of this trends, which currently stands at 57 percent (see Figure 12).<sup>54</sup> According to analysis of the U.S. Census Bureau's 2013 American Community Survey by the Brookings Institute, many of the U.S. large metro areas experienced driving declines between 2007 and 2013, while also seeing increases in commuters walking, biking, or working at home.<sup>55</sup>

### CCC INSIGHT

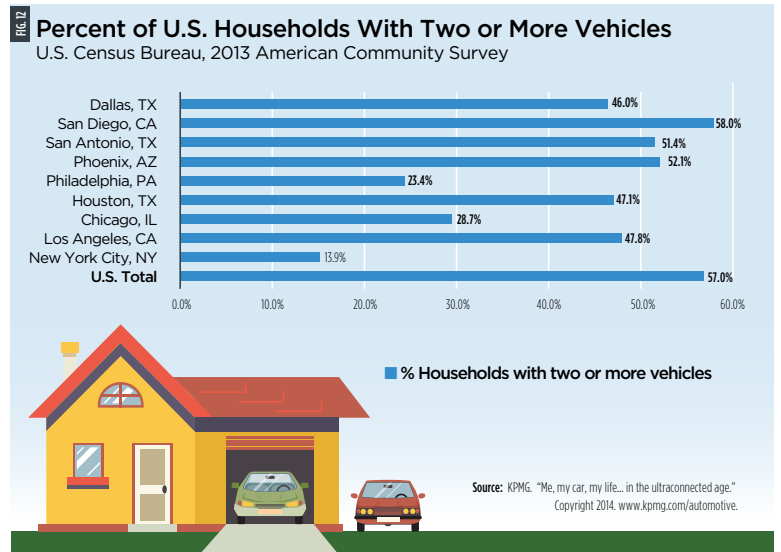
Despite an improved economy, lower unemployment and cheap gas prices, the broad demographic trends that have been in play for decades don't appear to be shifting direction. As more Baby Boomers retire, we could see a reduction in the number of vehicles they own; and other major demographic patterns (urbanization, telecommuting, car-sharing, etc.) continue to suggest that we may see little change in the percent of households in the U.S. with a vehicle, but the number of vehicles per household may decline. Additionally, although gas prices are expected to remain low through the next several years, any spikes would have a chilling effect on miles driven, particularly for Millennials who are finally finding their economic footing post-recession.

## Frequency Back on Track

Private passenger auto insurance had been experiencing a fairly steady rate of declining claim frequency over the last two decades with a variety of factors having been identified as contributors to the trend, including an aging population, fewer miles driven, graduated licensing for teenagers, higher deductibles and more vehicles than drivers. Several additional factors came into play with the recession, including higher unemployment and consumers modifying auto insurance policies to include only mandatory coverage.

This year however, we have seen larger increases in claim frequency, specifically for collision and comprehensive, while liability has remained relatively flat. Collision frequency had been falling steadily through 2006, saw a slight bump in 2007, then fell to its lowest point in two decades in 2008 through 2010. Since 2011, collision claim frequency has trended up, with mild fluctuations year-over-year, but saw a big increase in 2014, returning to a level last seen in 2005 (*see Figure 13*). Comprehensive loss frequency continued to see a great deal of volatility due to significant hail and wind storms that struck certain regions of the U.S. More on this will be discussed in detail when we look at the trend in vehicle repair costs later in this report.

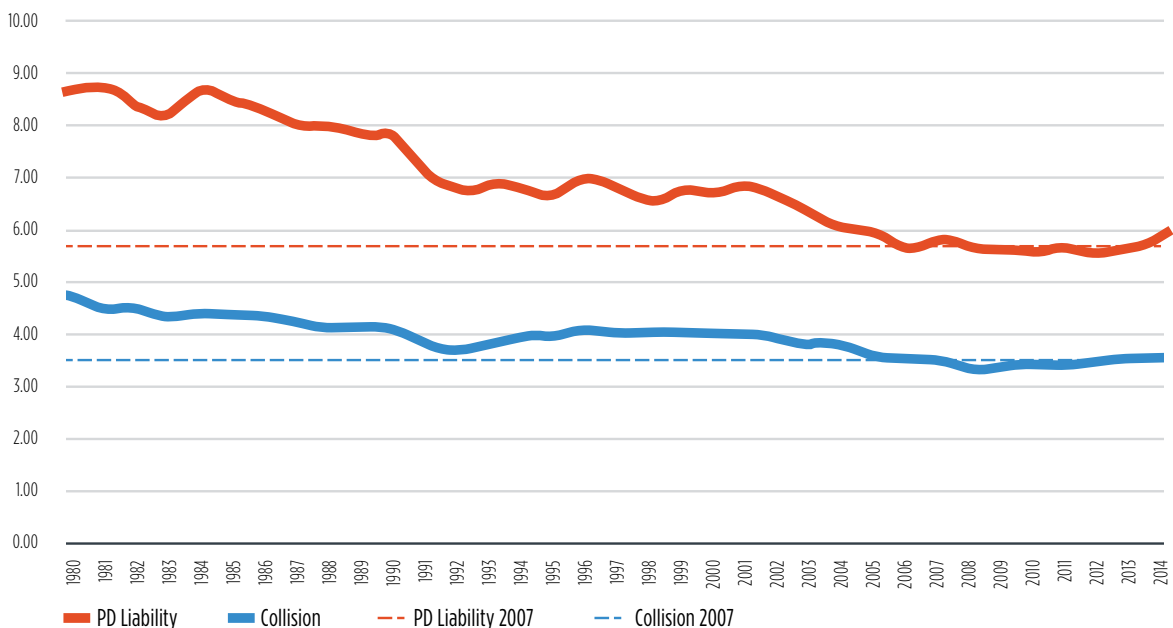
Factors that drove up collision claim frequency in 2014 include improved employment and inexpensive gas leading to more miles driven; continued strong new vehicle sales; and the Polar Vortex that hit many parts of the U.S. during the early part of 2014. After



several prior years with milder winters and only one or two major snow storms that halted driving for several days, the Polar Vortex of 2014 was one long period of continuous snowfall and ice, resulting in large vehicle pile-ups and numerous fender benders as vehicles slid into each other on the ice through intersections or on highways.

2014 was also the first year since 2009 where the volume share of repairable vehicle appraisals for vehicles aged current model year to 3 years of age exceeded levels last seen in 2009 (*see Figure 14*). With strong new vehicle sales over the last several years, newer model year vehicles have made their way into the mainstream - and into auto claims.

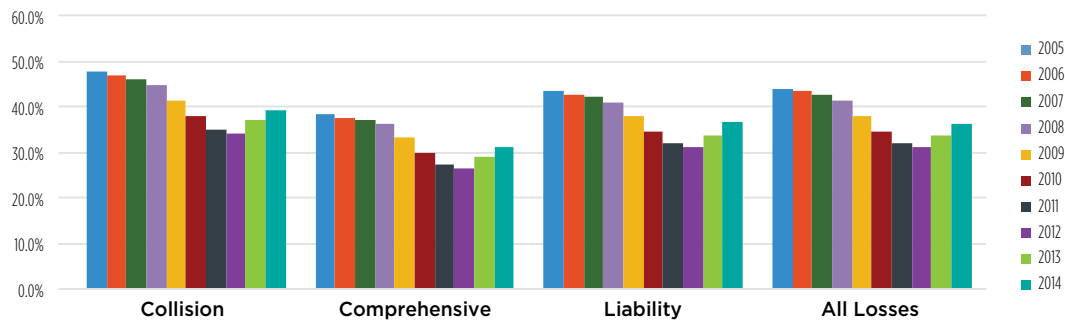
**FIG. 13** Fast Track Paid Claim Frequency by Calendar Year  
Rolling 4 Quarters ending Q4 Each Year



Source: ISS Fast Track Plus™ Personal Auto, As of September 30, 2014.

FIG. 14

## Volume Share for Vehicles of Current to Three Years of Age Repairable Appraisals by Loss Category CY 2005 to CY2014

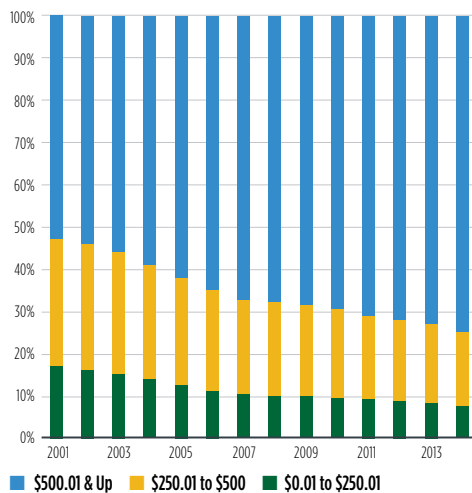


Source: CCC Information Services Inc.

Analysis of the deductibles for first party collision claims by calendar year underscore the continued shift toward higher dollar deductibles. Over a fourteen year period from 2001 to 2014, volume share of appraisals with deductibles \$1,000 and higher grew from 6.4 percent to 17.8 percent, while those in the deductible range of \$750.00 to \$999.99 grew ten-fold (see Figure 15). Of note is the growing share of three years and newer model year vehicle policies with \$1000 or higher deductibles versus those for vehicles aged 7-years and older (see Figure 16). Higher deductibles on newer model year vehicles may be one of several other factors, which will be explored later in the report and that might explain the larger increase in repair costs for newer model year vehicles than for older.

FIG. 15

### Share of Appraisal Count by Deductible Dollar Range CY 2001-2014

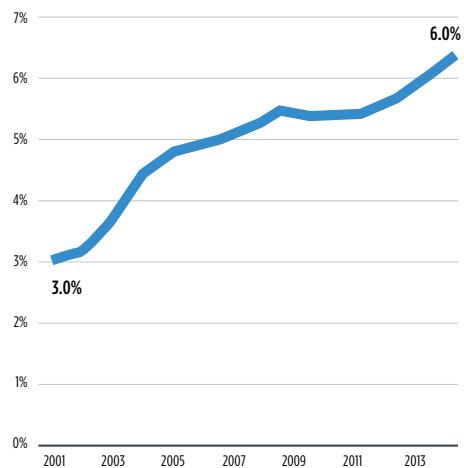


Source: CCC Information Services Inc.

FIG. 16

### Percentage Point Difference in the \$1000+ Deductible Dollar Range

For Vehicles Current to 3 Years of Age vs. Vehicles 7 Years+



Source: CCC Information Services Inc.

## CCC INSIGHT

Claim frequency has essentially returned to the levels last seen pre-recession. Driving this change are several factors: an improved economy, more miles driven, and erratic and significant weather events. An increase in new vehicle sales means more of these vehicles are on the road and having accidents. Data has shown that owners of newer model year vehicles tend to carry all lines of coverage, and are therefore more likely to file a claim after an accident simply because they have coverage. However, an increasing number of newer model year vehicles now have \$1000-plus deductibles, so consumers may opt to pay out of pocket or live with the damage when a vehicle has minor damage, only making a claim when the damage is significant. This would likely temper frequency to a degree. At the same time all of the 'big' demographic drivers pushing claim frequency down slowly over the last two decades are still in place. Subsequently while the automotive claim and collision repair industries have finally returned to a market without a recession hangover, the longer term trends still point to a slowly but steadily shrinking marketplace.

## New Vehicle Sales

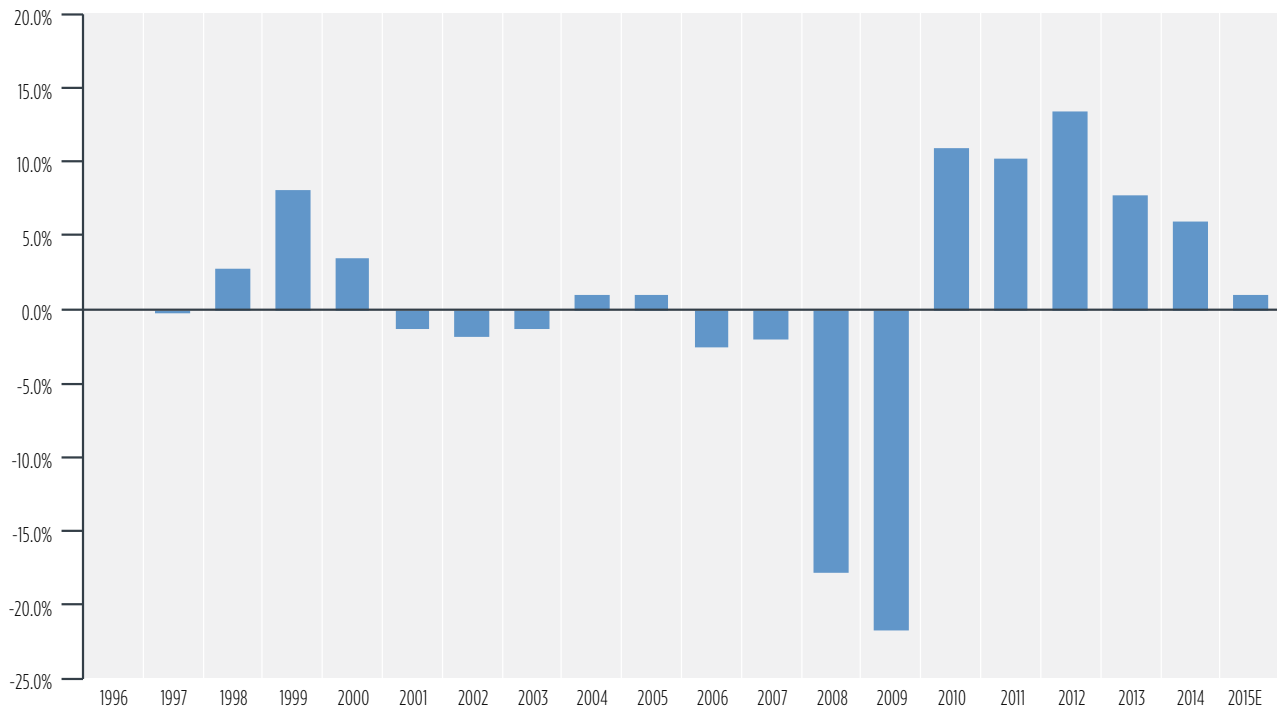
2014 was the fifth year in a row where new vehicles sales in the U.S. saw a nice lift; continuing its recovery from its 27-year low of 10.4 million sales in 2009.<sup>56</sup> New vehicle sales closed out 2014 at 16.53 million, up 6 percent from the prior year, and the most sales since 16.50 million in 2006 (*see Figure 17*).<sup>57</sup> With demand for new light vehicles outpacing U.S. economic, wage and housing growth rates, Morgan Stanley analyst Adam Jonas believes the rate of sales going forward is unsustainable.<sup>58</sup> However, most analysts are projecting sales will fall between 16.7 million and 17 million in 2015 based on assumptions of continued economic growth, low interest rates, improved employment, cheap gas prices, and whatever pent-up demand still remains.

Among the best news for the industry was the continued growth in the industry's average transaction price as tracked by TrueCar to \$33,168 in December, despite an increase of 6 percent in the average incentive per vehicle of \$2900.<sup>59</sup> According to data from *Automotive News*, consumers are paying about \$4500 more per each new vehicle than in CY 2004 in part because they are getting more – navigation, entertainment, and safety features are all becoming standard.<sup>60</sup> For example, the Ford Focus comes standard with 6.5-inch touchscreen, rear-view camera, and seven airbags – including one for the driver's knees.<sup>61</sup> At the same time,

the actual transaction price (excluding taxes, fees, accessories, F&I products, etc.) as a share of the vehicle MSRP (average sticker price of the sold vehicle) continues to be about three to five percentage points higher than pre-recession, suggesting automakers are doing a better job of manufacturing the vehicles that consumers actually want (*see Figure 18*).<sup>62</sup>

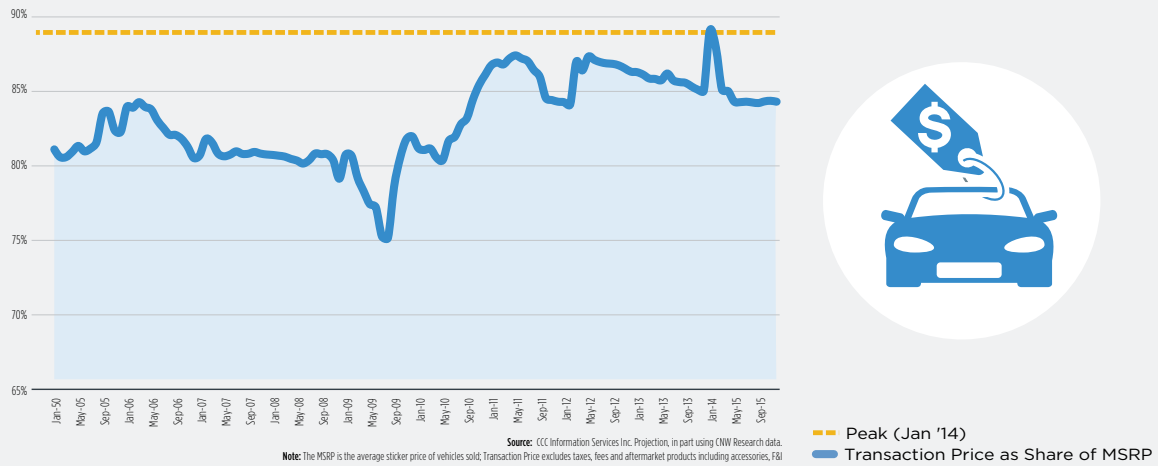
Sales of light trucks were stronger than passenger cars for the first time since 2011; sales of light trucks came in at 8.6 million versus 7.9 million for cars.<sup>63</sup> In fact, big pickups logged in with top 3 model sales spots for the year, with the Ford F-series retaining its number one spot, followed by the Chevy Silverado and the Chrysler Ram pickup in third place.<sup>64</sup> And sales of crossovers and SUVs rose 11.8 percent in 2014 alone, as consumers scooped up the numerous new vehicles in this class.<sup>65</sup> With average profit margins of \$10K for large sport utilities and pickups versus \$2K for midsize passenger cars, the Detroit 3 automakers realized strong profits for the year.<sup>66</sup> And despite the increase in truck sales, improvements in fuel economy through light-weighting of vehicles and other engine technologies helped raise the average fuel economy of vehicles sold during calendar 2014 to 25.4 mpg, versus 24.8 mpg during calendar year 2013.<sup>67</sup>

**FIG. 17 Annual Percent Change – U.S. New Light Vehicle Sales**



Source: [www.autonews.com](http://www.autonews.com)

**FIG. 18 New Vehicle Transaction Price as Share of MSRP**

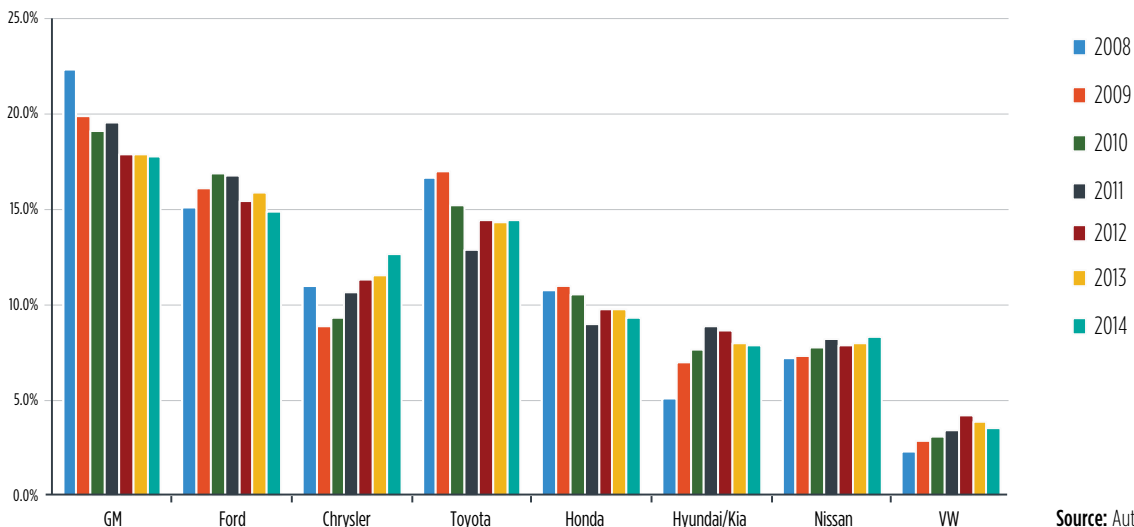


Among the other sales highlights' was significant growth in sales of Asian vehicles led by 21 percent growth by Subaru, Toyota Division (7 percent), and Nissan Division (12.2 percent) (*see Figure 19*).<sup>68</sup> In fact, Asian manufacturers' sales topped combined sales of Domestic and European manufacturers by over 35K vehicles.<sup>69</sup> Sales of luxury vehicles were also very strong in 2014, with manufacturers such as BMW, Audi, Porsche and Land Rover all reporting record sales.<sup>70</sup>

In 2014, automakers introduced 136 new or redesigned models – this number is expected to grow to 142 in 2015.<sup>71</sup> With more models to choose from, the ability for automakers to grow sales per model gets tougher. Between 2011 and 2013, only 70 percent of mainstream models saw year-over-year sales volume increases; in 2014 this number dropped to 59 percent according to J.D. Power.<sup>72</sup>

Lease penetration rates ramped up in 2014 to nearly 30 percent by year-end, playing a key role in driving up new sales overall. Strong residual values, low interest rates, and the ability to manage to a monthly payment continue to make leasing a very attractive option for consumers that want to take advantage of all of the new features available in today's vehicles. Improved sales overall will mean an increase in supply of used vehicles over the next five years: TrueCar forecasts an annual increase each year between CY 2015 and CY 2020 in used supply of vehicles aged 1-5 years, which should help lower transaction prices.<sup>73</sup> However, sales of vehicles of model years 2008 through 2014 averaged over an estimated 3.5 million fewer than the 10-year average annual sales figure of 16.7 million ending in 2007 (*see Figure 20*). Supply of these vehicles will subsequently always be much tighter than for model years older than 2007 and younger than 2014, and may retain their values better even as used-vehicle supply overall improves.

**FIG. 19 Annual Share of U.S. New Light Vehicles by Automaker (2008 - 2014)**



Source: Automotive News



**FIG. 20** **U.S. New & Used Vehicle Sales**  
CY 1998 to 2014

CY	New Sales	Used Sales	Total Sales
1998	15.5	40.8	56.4
1999	16.8	40.7	57.5
2000	17.4	41.6	59.0
2001	17.2	42.6	59.8
2002	16.9	43.0	59.9
2003	16.7	43.6	60.2
2004	16.8	42.7	59.5
2005	17.0	44.1	61.1
2006	16.5	42.6	59.1
2007	16.2	41.6	57.8
<b>10-Year Average</b>	<b>16.7</b>	<b>42.3</b>	<b>59.0</b>
2008	13.3	36.5	49.9
2009	10.4	35.5	45.9
2010	11.6	36.9	48.5
2011	12.8	38.8	51.6
2012	14.5	40.5	55.0
2013	15.6	42.0	57.6
2014	16.5	42.1	58.6
<b>5-Year Average Since 2010</b>	<b>14.2</b>	<b>40.1</b>	<b>54.3</b>

Source: CCC Information Services Inc. Projection, in part using CNW Research data

**Used Vehicle Sales**

Used vehicle sales also increased in 2014, with 42.05 million used vehicles sold in the U.S. by franchised dealers, independent dealers, and the private sector.<sup>74</sup> Improved supply of lease and rental returns provided dealers with more vehicles to sell as certified pre-owned vehicles which saw 10.8 percent growth in sales to 2.34 million vehicles - the fourth consecutive best-ever year.<sup>75</sup>

One of the key factors driving stronger sales has been continued low interest rates and lots of available credit. Throw in low gas prices, and according to Tom Webb from Manheim “It doesn’t get any better than it is right now.”<sup>76</sup> So despite growth in the share of sales with financing, and increases in the share of new and used vehicle buyers with FICO scores under 670 (subprime segment), delinquency rates still remain low, suggesting borrowers are making their payments.<sup>77</sup> In fact, according to Manheim, the last four years have shown the least amount of volatility in wholesale used vehicle pricing since the start of their used vehicle value index in 1995.<sup>78</sup> TransUnion estimates that subprime loans accounted for 22 percent of the outstanding auto loan balances in 2009, while that figure from Q2 2013 to Q3 2014 was closer to 14-15 percent.<sup>79</sup> Subsequently while subprime borrowers’ delinquency rates have risen from 4.2 percent in Q3 2012, to 4.5 percent in Q3 2013 to 5.3 percent in Q3 2014, there is not a great deal of concern that the sales growth within the subprime market will fall off in 2015.<sup>80</sup> Data shared by TransUnion in January 2015 illustrated that consumers pay their car payments first before their mortgage payments, and given the nature of the asset financed, it does not compare well to the mortgage financing bubble that burst in the last recession.<sup>81</sup>

As consumers are faced with higher prices for new and used vehicles, the length of their loans has also grown. In 2014, data from Experian shows loans of 73-84 months accounted for 25.7 percent of all new-vehicle financing, up from 11 percent in 2008 and 9.7 percent in 2010.<sup>82</sup> This has pushed the average loan term for all new-vehicle sales to 66 months, up from 62 months in 2008.<sup>83</sup> Additionally, as the Experian data shows, most buyers hold onto a vehicle for 96 months (up from 88 in 2008), so length of ownership is growing alongside the longer loan terms.<sup>84</sup>

Overall there is limited concern among analysts that availability of financing will slow or that auto loan delinquency rates will soar; auto finance executives believe the industry is positioned for strong new and used vehicle sales in 2015.

**Vehicle Shopping Goes Digital**

The way consumers are vehicle shopping is also showing signs of the reach of mobile and digital technology. In 2013, 40 percent of the traffic on Edmunds.com came from mobile, versus less than 5 percent in 2010.<sup>85</sup> Edmunds and other third party shopping sites like Car.com and TrueCar are investing a great deal in mobile capabilities that will help dealers target customers by age, location, vehicle preferences, and other characteristics.<sup>86</sup>

Data from the AutoTrader.com’s 2015 Automotive Buyer Influence study reveals 42 percent of recent auto purchasers used multiple devices to shop in 2014, with used vehicle buyers leading the charge with the largest increases in use of smartphones and tablets for car shopping. And while 82 percent of car buyers that used the internet to shop for cars in 2014 used a laptop or desktop computer, this was down from 91 percent in 2013, and smartphone usage grew from 19 to 39 percent and tablet usage grew from 19 to 35 percent.<sup>87</sup>

**CCC INSIGHT**

The U.S. experienced strong new and used vehicle sales in 2014, and analysts are projecting strong sales again in 2015, but believe the market will become even more competitive. In order for manufacturers and dealers to reach the consumer, they must beef up their capabilities in the digital arena, to not only get the mind-share of consumers for their products, but also be able to successfully reach and close the sale. Consumers are looking for more content in their vehicles, whether related to safety or convenience; they are also looking to have the vehicle purchase process meet the expectations from an experience perspective that has been set when shopping at the Apple store or online at Peapod.

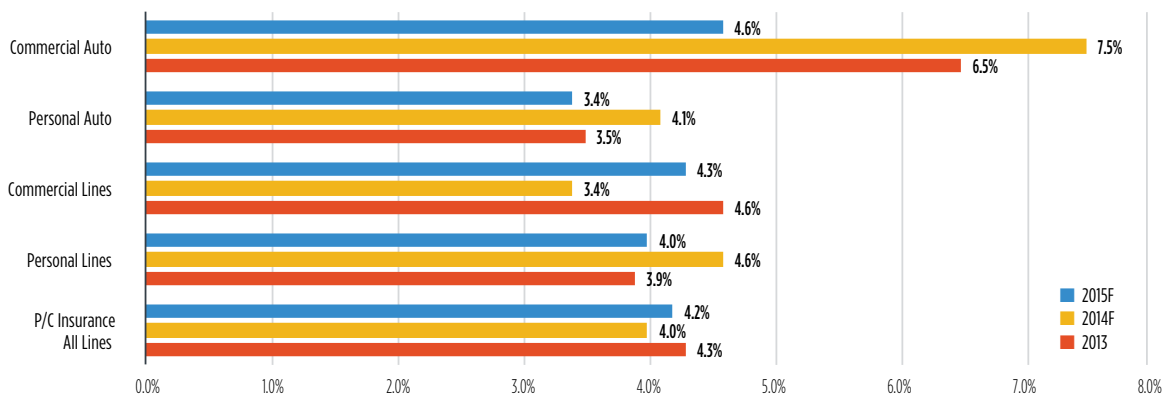
## Insurance Industry's Digital Call to Action

Low interest rates may be helping to drive auto sales and auto premiums, but have also resulted in lower investment incomes for the insurance industry. Overall net income after taxes (profits) for the property casualty insurance industry for the first nine months of 2014 were \$37.65 billion, down 11.9 percent from the industry's strong results during the first nine months of 2013, but up from a low of \$8 billion for first nine months of 2011 and \$27.8 billion for the first nine months of 2012.<sup>88</sup> Premium growth also slowed slightly in the first nine months of 2014 to 3.9 percent, versus 4.2 percent same period 2013; however, the industry is still experiencing its longest sustained period of gains in a decade.<sup>89</sup> As economic growth continues, increases in vehicle sales, homes, and jobs will help drive further growth in 2015. Analysts anticipate net premium growth for the overall property casualty insurance market of 4 percent for the full year 2014; this is down from the 4.6 percent growth in 2013 and 4.3 percent growth in 2012. Personal auto saw similar growth, and is projected to see direct premium growth of 4.6 for 2014 (see Figure 21).<sup>90</sup>

Private passenger auto insurance (PPA) accounts for 37 percent of property casualty insurance industry's premiums and continues to be a primary driver of profit for the insurance sector. However, increasingly stiff pricing competition, low investment returns and increasing losses have resulted in combined ratios for PPA that have exceeded 100 since 2007 (see Figure 22).<sup>91</sup>

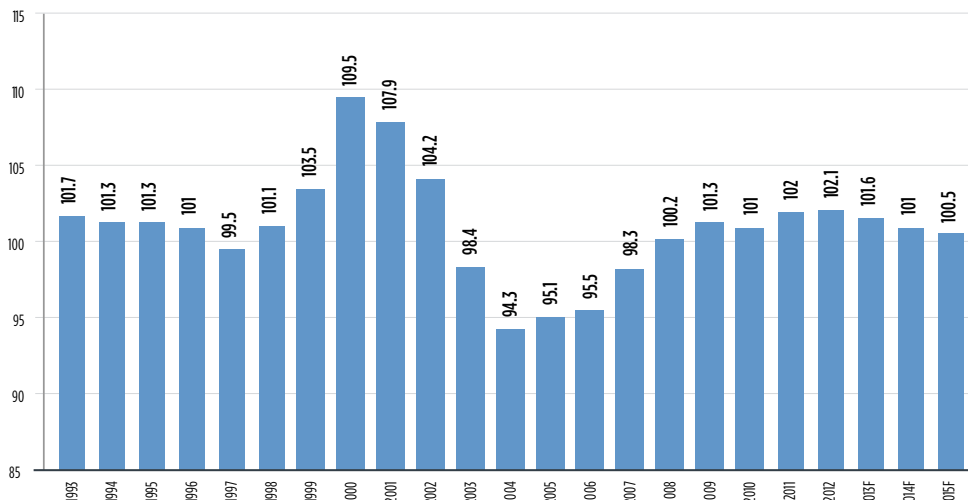
A recent article in The Auto Insurance Report discussed the increasingly competitive nature of the auto insurance industry in detail, and predicted that given the rate at which technology is making it more visible for customers to price insurance and understand whether a carrier can provide the type of service they are looking for, carriers that have mediocre results will ultimately disappear.<sup>92</sup> A larger and larger share of overall premium continues to shift to the top carriers; as of 2013 the top five carriers had over 50 percent of PPA direct premiums written (see Figure 23).<sup>93</sup>

**FIG. 21** Direct Premium Growth by Line, 2013-2015F



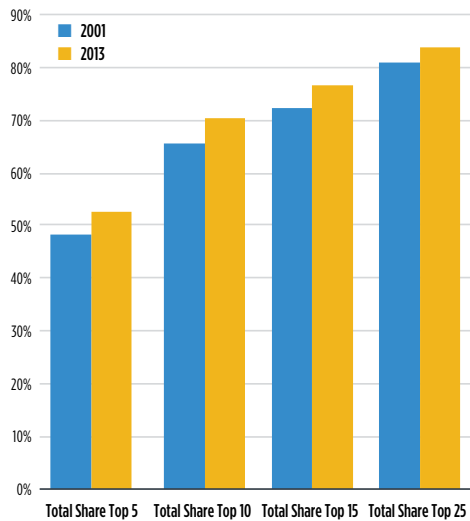
Source: Conning, Insurance Information Institute. "The Global Economy, Rising Risk and Marine Insurance Markets." September 22, 2014. [www.iii.org/presentations](http://www.iii.org/presentations).

**FIG. 22** Private Passenger Auto Combined Ratio: 1993-2015F



Sources: A.M. Best (1990-2012); Conning (2013F-15F); Insurance Information Institute.

**FIG. 23 Private Passenger Auto Share of Net Premiums Written**



Source: A.M. Best, NAIC

### Insurance Industry’s Digital Call to Action (cont’d)

Meeting changing consumer expectations around product offerings and service is critical. Billions of dollars are spent each year by insurers on advertising in an attempt to gain more share from an otherwise very slowly growing marketplace. The marketplace continues to be extremely competitive, and with the entrance of Google into the online insurance shopping arena, competition will become even harder.

Early 2015, Forrester Research’s Ellen Carney reported in her blog that Google Compare Auto Insurance Services Inc.—its online auto insurance shopper—was licensed to sell insurance in at least 26 states, and is already working with several insurers.<sup>94</sup> Google is also reportedly working with CompareNow.com, a platform that lets an individual shopping for insurance submit a single form to get quotes from multiple carriers, and if desired complete the purchase via phone or online.<sup>95</sup> And while Google is not actually underwriting the insurance policy, it potentially still becomes the primary point of contact for the customer relationship.<sup>96</sup>

So how do insurers compete? Consumers now spend more time than ever before researching their options before they make any type of purchase. What’s interesting however is that while consumers have become much more discerning around price – price is not the only factor in their purchase decision. More and more customers are willing to pay more for a better customer experience.

A study conducted by Oracle in 2012 found that customer experience is a key component of revenue growth in an increasingly globalized economy where products and services are increasingly commoditized.<sup>97</sup> Their study, “Why Customer Satisfaction is No Longer Good Enough,” reveals that 81 percent

of consumers surveyed are willing to pay more for superior customer experience.<sup>98</sup> And nearly half (44 percent) indicated they would be willing to pay a premium of more than 5 percent.<sup>99</sup>

Another recent study released by Accenture, called “Customer Driven Innovation Insurance Customer Study” found that 54 percent of consumers aged 18-24 and 52 percent of those aged 25 to 34 responded they would probably or certainly be willing to pay more for auto insurance with personalized service.<sup>100</sup> In fact, the survey respondents under the age of 35 indicated price mattered less to them as long as they received more value.<sup>101</sup>

Carriers are responding to consumer demand for more choice and personalization across all areas of their business, providing greater access to their customers via mobile devices. Knowing where to make the investments in technology needed to meet the challenges of this new digitally charged world could be the make or break move for carriers over the next several years. As Bernd Heinze, executive director of the American Association of Managing General Agents (AAMGA) wrote: “We are living in an age of insurance that is totally different than it was even 10 years ago—how it’s underwritten, marketed, sold, priced, all has changed dramatically...”<sup>102</sup>

### How Insurers Can Answer the Call

According to the group Strategy Meets Action (SMA), the insurance industry has historically made strategic investments in technology to support growth, cost management, and business optimization.<sup>103</sup> But now for the first time, SMA finds insurers have added customer demands/expectations and agent expectations to their top five business drivers list.<sup>104</sup> Deborah Smallwood of SMA writes “...Many insurers have arrived at the inevitable conclusion that becoming a digital insurer is not only a necessary business imperative; it is mandatory.”<sup>105</sup>

In its Digital Innovation Survey released in December 2014, Accenture lays out six characteristics among carriers leading in digital value creation.<sup>106</sup> The first is that digital leaders in the insurance space are looking to expand or create new business opportunities by partnering, purchasing, or building. Having a single, connected and comprehensive view of a customer across all systems is the second characteristic. They are making investments in or purchasing start-ups or companies with innovative products to leverage their expertise, often adding non-insurance products to extend their brand and offerings to their customers. And finally, they are using analytics and data to reach their customers.<sup>107</sup>

A recent survey by Novarica suggests insurers plan to increase their focus on analytics-driven product design and products optimized for buying/selling in 2015.<sup>108</sup> In the claims arena, carriers are using analytics to support straight-through processing from first notice of loss; using technology to facilitate a paperless process for claimants; and deploying video and GPS in the field for data capture.<sup>109</sup>

## How Insurers Can Answer the Call (cont'd)

What's clear from other industries is that interactions among customers, suppliers, and employees can be enhanced with digital technology: content becomes much more accessible; messages can be tailored to the specific audience and can be set up to take advantage of social connectivity.<sup>110</sup> When companies look externally beyond traditional market boundaries and competitors, and are more open to customers' input, they are better positioned to deliver products that are more intimate and personalized.<sup>111</sup> Consumers today don't just want to buy something, rather they want to buy into something – an experience.<sup>112</sup> “Of all you can do with big data, developing new products and services is the most valuable.” (Quote from Tom Davenport, the President's Distinguished Professor in Management and Information Technology at Babson College and author of *Big Data at Work: Dispelling the Myths, Uncovering the Opportunities* (Harvard Business Press, 2014).<sup>113</sup>

### Don't Get Left Behind

Perhaps one of the best examples of where the insurance industry has begun to use the data gathered from digital technology is in the area of Telematics or usage-based insurance. Numerous carriers have implemented telematics, where real-time data re: a consumer's driving can impact the cost of their insurance. A poll of the attendees at the Telematics Insurance 2014 conference predicted 10 percent of auto insurance policies sold in the next several years would be usage-based insurance policies. Perhaps one of the best examples of how a carrier is partnering with someone outside the industry to extend their reach with customers comes from a recent OnStar announcement whereby the company plans to offer its customers access to driver assessment data showing them important driving metrics and how they compare against an aggregate of other subscribers.<sup>114</sup> The OnStar customer sees the assessment and can then opt to share with Progressive to determine whether they qualify for a discount.<sup>115</sup> The program is slated for summer 2015.

Within the telematics arena there are still numerous unanswered questions around consumer privacy and data ownership. A recent survey by insuranceQuotes.com found Millennials are the most interested in pay-as-you-drive insurance, but concerns about the sharing of private information has led to a decline in interest among all age groups.<sup>116</sup> As carriers blend the data collected from the telematics devices with third party data sets such as geography of the road, weather conditions, and traffic patterns better granularity around driver behavior is available.<sup>117</sup> The key question then is who should benefit from this data – the consumer providing the data, or the insurer? To that end, the U.S. Department of Transportation is looking to fund two projects that will demonstrate the creation of a competitive insurance market using driver data – where insurance companies accept data from a shared platform with shared actuarial results.<sup>118</sup> The

goal is to incent consumers to drive more safely by helping them understand how their driving impacts their rates.

Telematics devices are just one example of an IoT device ('Internet of Things'). Deloitte estimates that one billion wireless IoT devices will be shipped globally in 2015, up 60 percent from 2014, resulting in an installed base of 2.8 billion devices.<sup>119</sup> And while the devices themselves are projected to be worth \$10 billion in 2015, nearly \$70 billion will come from the associated services enabled by the devices.<sup>120</sup> Sixty percent of these devices Deloitte predicts will be bought, paid for and used by enterprises and industries.<sup>121</sup> Additionally, Deloitte categorizes the market for the IoT analytics market into three areas: descriptive (\$800 million), predictive (\$180 million), and prescriptive (\$14 million).<sup>122</sup> All three areas are expected to grow by 500 percent over the next four years, with the prescriptive subset to grow by over 3,000 percent.<sup>123</sup>

For the insurance industry, the IoT could provide better and more detailed information on the exposures, hazards and risks of what is being insured. However, in order for this to actually impact losses and premiums, there needs to be clear alignment between what information is being 'sensed' with hazards and risks, and the opportunity to change behavior or performance based on this data.<sup>124</sup> The data must also be secure.

With growth of IoT, there is growing concern and need to ensure that these devices also remain secure from cyber risk. In fact, within the U.S. Department of Defense, cyber operations and cyber space are domains alongside the traditional domains to defend - land, sea, air, and space, with the difference being that technology crosses over into every other domain.<sup>125</sup> Underscoring this focus, the Pentagon's Deputy Chief Officer of Cybersecurity, Richard Hale, said “Whether the computer is on a desk or in a medical device or in the engine of a jet airplane, that computer has to be designed to be as resistant to attack as possible, it has to be configured securely every second, [and] it's got to be able to be updated as quickly as possible.”

### Security is the New Business Imperative

Researchers from Harvard presenting at The World Economic Forum in Davos, Switzerland predicted: “Privacy as we knew it in the past is no longer feasible... How we conventionally think of privacy is dead.”<sup>126</sup> And while there are certainly aspects of this that are quite frightening, the panelists also spoke of the many benefits, from advances in health care, convenience, and improved national security.<sup>127</sup>

As more and more data on each individual consumer is captured from social media, telematics, and the Internet of Things, that data has become a commodity or currency in the digital world in which we live.<sup>128</sup> Critical information such as gender, income, where the consumer shops, what he/she shops for, how often, and any major events such as marriage, parenthood, home

purchase, etc. are all data points that help companies determine how, when and what to market to each individual consumer. However, because that data is so personalized and private, the need for better network security and cyber insurance are growing.<sup>129</sup> Questions regarding the use of all of this data and how it may encroach on individual privacy and civil liberties have prompted the U.S. government to conduct a review of big data and privacy.<sup>130</sup> John Podesta, advisor to the White House wrote the following about this review: "We are undergoing a revolution in the way that information about our purchases, our conversations, our social networks, our movements, and even our physical identities are collected, stored, analyzed and used. The immense volume, diversity and potential value of data will have profound implications for privacy, the economy, and public policy. The working group will consider all those issues, and specifically how the present and future state of these technologies might motivate changes in our policies across a range of sectors."<sup>131</sup>

Numerous cyber breaches in 2014 raised awareness of the need for improved cyber security and insurance. According to data from

the Identity Theft Resource Center, the number of data breaches (up 38 percent) and number of records exposed (up 408 percent) have grown exponentially over the last several years (*see Figure 24*).<sup>132</sup> The risks associated with Cybercrime rose 10 spots to the fifth most critical challenges facing businesses this year according to the Allianz Risk Barometer 2015. The first four spots were business interruption and supply chain risks; natural catastrophes; fire/explosion; and changes in legislation and regulation.

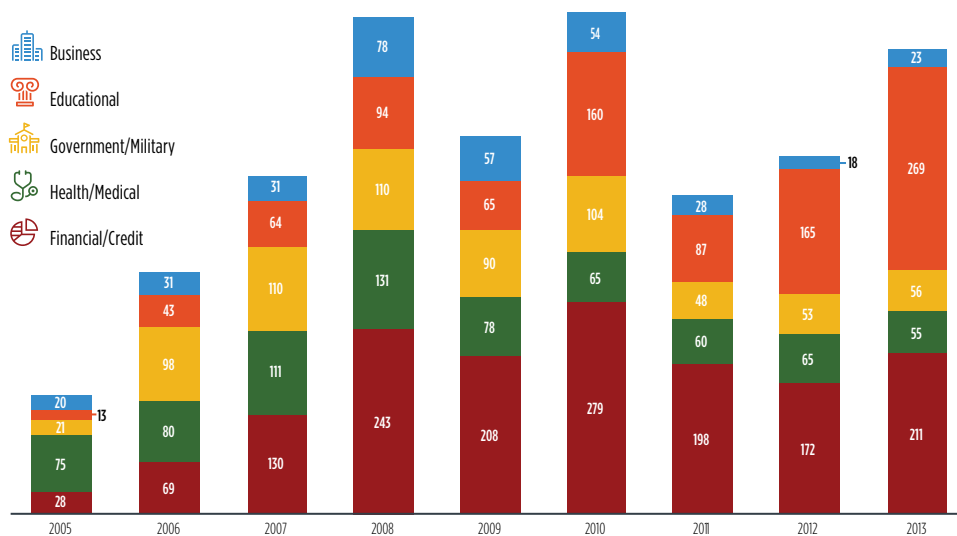
Lastly, as companies and governments expand their use of data to guide policies and decisions, look for growing demand for 'algorithmic transparency' - where demand grows for greater transparency into not just the data being used but more importantly the code itself.<sup>133</sup> Algorithms were identified as one of the key tech trends to watch in 2015 – not only how they are designed ("algorithmic curation"), but also how they are monitored for accuracy and proper use ("algorithm ethics and oversight"), and the growing marketplace for the sale of these algorithms ("algorithm marketplaces").<sup>134</sup>

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A great deal has been written about the growing imperative for insurers to take advantage of data and analytics gathered from a multitude of sources to hone their marketing, reach new customers, improve customer service, and do more with less. And while insurers have always used immense amounts of data, their ability to incorporate data from non-traditional sources and create new products solo or in concert with another outside-industry company, is becoming a must-have skill. As the homes and vehicles insurers underwrite become ever more digitally connected the ability to react quickly to more data with new products and services becomes a true business imperative.

For repairers, data and analytics can help drive transparency with your customers and offers visibility into your business performance. All companies should have a clear understanding of how and what data is being pulled from their own systems by other companies with which they do business, and understand how that data is being used. Effective use of data also allows identification of issues and opportunities; and with mobile and social tools, that data can be made available to your customers to achieve greater transparency of the entire repair process.

**FIG. 24** Identity theft resource center cyber breach statistics: 2005-2013



Sources: [www.idtheftcenter.org/images/breach/20052013UPDATEDSummary.jpg](http://www.idtheftcenter.org/images/breach/20052013UPDATEDSummary.jpg)



## The Digital Vehicle

According to the Center for Automotive Research, even the automotive segment is dealing with the transition from a primarily mechanical-based industry to a software-based industry.<sup>135</sup> More and more automakers are introducing vehicle features that connect the vehicle to the outside world, whether it's basic navigation, WiFi hot spots, self-diagnostic services, crash avoidance, or vehicle-to-vehicle communication. A connected vehicle population is attractive not only to the vehicle occupants (better infotainment, safety and convenience) but is of great interest to many companies as the data captured opens up numerous new opportunities in terms of products and services.<sup>136</sup> Automotive supplier Continental estimates connected cars could bring approximately 1 billion hours of Internet connection every day, helping companies such as Google provide even more personalized marketing messages to vehicle occupants.<sup>137</sup>

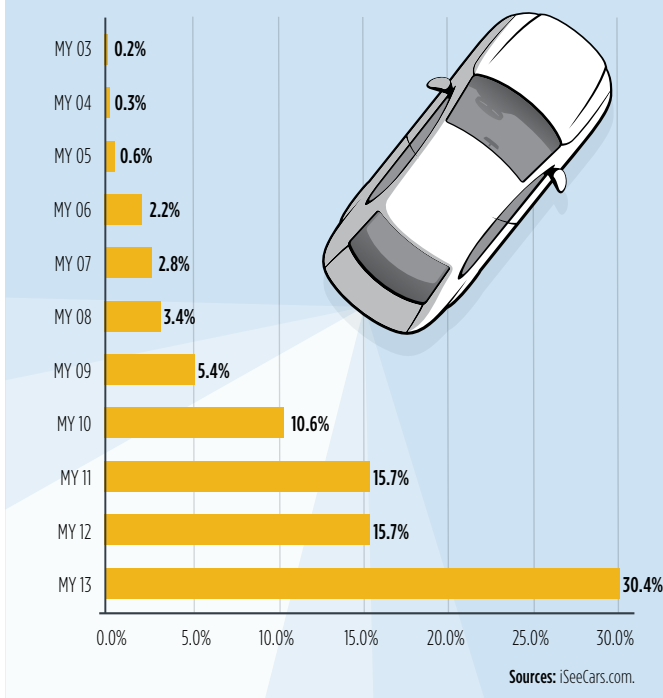
Car sharing services are just one early example of how digital services brought to the vehicle are changing the world. Many auto insurance companies have begun crafting new products to address the challenges of insuring the drivers working for companies such as Uber and Lyft, by providing coverage from the time they turn on their ridesharing app until they are matched with a passenger.<sup>138</sup>

Another example of how technology is changing the auto is the rapidly growing market for collision avoidance and driver assistance. Numerous software programs are being developed to connect to the broad array of sensors and cameras. Sales of anti-crash sensors alone are projected to reach \$9.9 billion by 2020, with radar and cameras accounting for the lion-share, followed by ultrasound and LIDAR.<sup>139</sup> This means huge business for automotive suppliers such as Bosch, TRW Automotive, Continental AG, Denso Corp., and Delphi Automotive, and even potentially for companies such as Google and Apple. With NHTSA mandating that all vehicles under 10,000 pounds manufactured on or after May 1, 2018 come equipped with rear visibility technology<sup>140</sup>, sales of onboard cameras are expected to triple globally by 2010.<sup>141</sup> A recent study conducted by iSeeCars.com found that less than 9 percent of vehicles on the road in 2014 had a back-up camera system installed, but by 2018 that number is expected to grow to 31 percent (*see Figure 25*).<sup>142</sup>

As automakers have responded to government regulation on fuel economy, emissions reductions, safety, and other factors, new products and technologies have been developed that have led to a much more technologically sophisticated vehicle fleet. Vehicle electronics are estimated to make up as much as 40-50 percent of the total cost of the vehicle, up from less than 20 percent a decade ago (*See Figure 26*). Today the average vehicle might contain 60 microprocessors to run its electrical content versus only about 15 microprocessors ten years ago; has a hundred or more sensors located throughout the car providing data to the microprocessors; has a mile of wiring that connects everything; and has the standard 10 million lines of code that run the vehicle's computer network.<sup>143</sup>

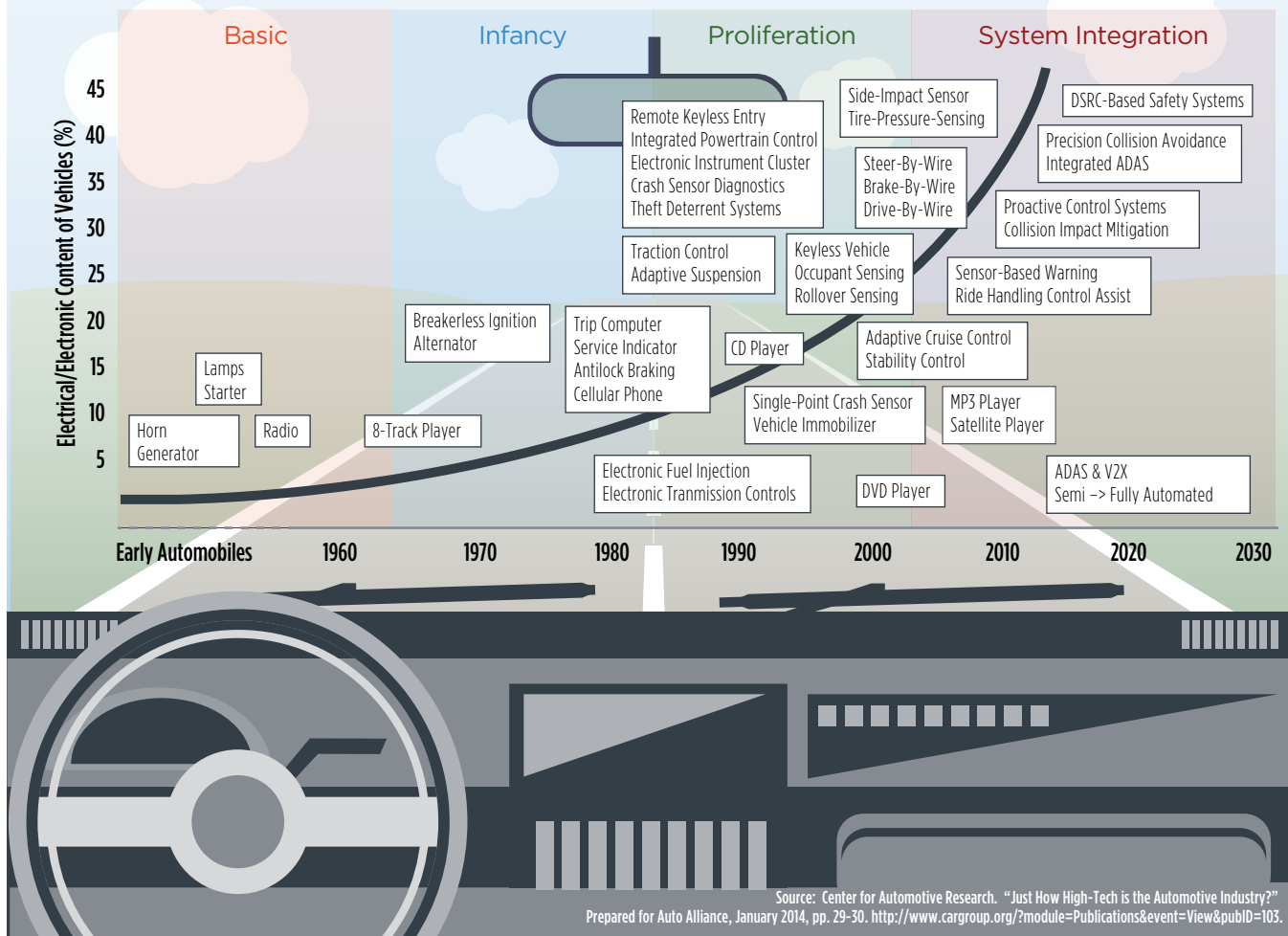
The Insurance Institute for Highway Safety reported in December 2014 that 71 vehicles met the new and more difficult safety standards for their 2015 'Top Safety Pick' or 'Top Safety Pick+' awards. In order to receive either award, a vehicle must receive a good or acceptable rating in the small overlap front test and a good rating in each of the Institute's four other crash-worthiness evaluations — moderate overlap front, side, roof strength and head restraints.<sup>144</sup> Vehicles that also have available front crash prevention system that earns an advanced or superior rating can receive the 'Top Safety Pick+' award. Automakers with strong small overlap front tests have used similar strategies to improve their vehicles' occupant protection: reinforcing at least one part of the door frame; reinforcing the side frames that are tied into the main frame rail, thereby providing an additional load path for crash force; and addressing potential for steering column - and as a result the front driver air bag, to shift<sup>145</sup> And while these changes to vehicle construction and incorporation of crash avoidance technologies lead to fewer injuries and fatalities, there can also be an increase in the time and cost to repair the vehicle.

**FIG. 25** Percent of Available Vehicle Models with a Back-up Camera as a Standard Feature





## Center for Automotive Research: Growth of Electronic Vehicle Content

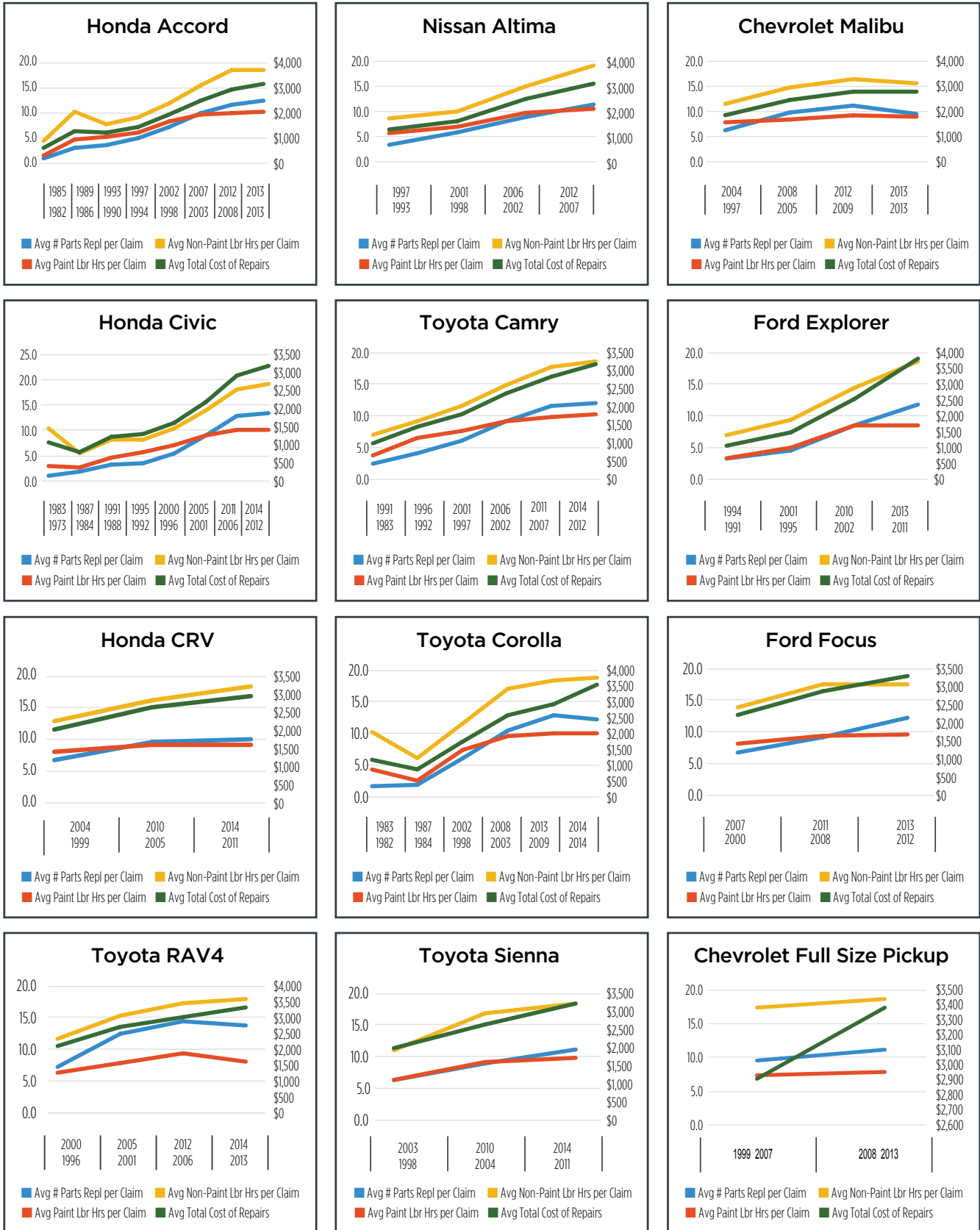


Look inside any new vehicle today and a quick visual scan of the dashboard and interior illustrates how much more complex today's vehicles are from those manufactured even ten to twenty years ago. The impact to collision repair is underscored just by a quick comparison of metrics captured from vehicle appraisal data for collision losses this past year across the different redesigns or versions of twelve high volume vehicles sold in the U.S. For example, in CY 2014, the average number of parts replaced on a collision loss for a MY 2003-2007 Honda Accord was 10 parts, versus 11.6 for MY 2008-2012 and 12.5 for MY 2013. The average repair cost for the newest model was 8 percent higher as well (see **Figure 27**). Labor hours and refinish hours also increased with each new vehicle redesign. And while there may be other factors besides increased vehicle complexity driving these differences, the visuals provide compelling support that the newer models manufactured require more parts and labor now than their earlier designs. A comparison of the average OEM list price for several of the top replaced parts for year one of each redesign, analyzed from CCC's repairable appraisal data, illustrates the natural inflation that has occurred and shows part costs that ultimately drive overall repair costs. For example, the average price of a front bumper

cover for the MY 1997-2001 Toyota Camry was \$170 in CY 1997; by CY 2012, the price for a fender for the MY 2012-2014 Toyota Camry was \$278 (see **Figure 28**).

Increased vehicle complexity and growing numbers of new or revamped models have led to an increase in the number of vehicle recalls. 2014 set a new record for vehicle recalls – surpassing 60 million, doubling the previous annual record of 30.8 million in CY 2004<sup>146</sup>. Among the largest recalls were the recall for the GM defective ignition switches (27 million vehicles) and the Takata air bags. A study by financial advisory firm Stout Risius Ross Inc. looked at 220 vehicle models from Ford, GM, Chrysler, Honda, Hyundai, and Toyota, and found that 54 percent of those vehicles from the first model year experienced a recall in the years that followed (**Figure 29**).<sup>147</sup> As the pressure to speed innovation and as levels of technology grow, so too does the vulnerability to 'hard failures' resulting from software glitches. The SRR research found significantly greater growth in the cumulative number of vehicles recalled for non-engine recalls than for engine recalls, as well as large spikes from 'safety-related' recalls for components such as air bags, service brakes, vehicle speed control, steering, visibility, etc.

# Collision Losses for Top Volume Vehicles - Comparison of Appraisal Metrics by Vehicle Redesigns

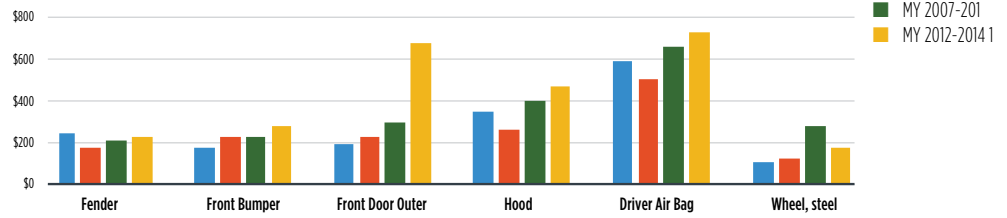


Source: CCC Information Services Inc.

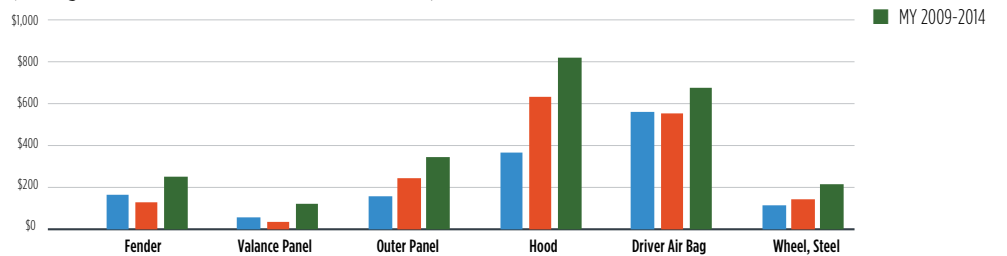
Finally, any discussion on the digital vehicle cannot leave out the autonomous vehicle. So when can we expect autonomous vehicles to go mainstream in the U.S.? Predicted date of arrival varies from 2017 per Google to 2020 per Mercedes-Benz. With Google admitting it hasn't fully solved the challenge of how an autonomous vehicle deals with snow, don't expect early markets to fall outside the Sunbelt.<sup>148</sup> And with driverless vehicles also not immune from cyber risk (theories abound that criminals may use them as autonomous car bombs, override safety features to cause vehicle pile-ups, or even free up their hands to be able to shoot during a get-away), expect further debate about what NHTSA requires of these vehicles before deployment.<sup>149</sup>

**FIG. 28** Average OEM List Price of Common Replacement Parts in Year 1 of Each Vehicle Redesign

**Toyota Camry - Avg OEM List Price from Year 1 of Each Vehicle Redesign**  
(i.e. Avg OE List Price in CY 1997 for MY1997-2001)



**Ford F150 - Avg OEM List Price from Year 1 of Each Vehicle Redesign**  
(i.e. Avg OE List Price in CY 1997 for MY 1997-2001)



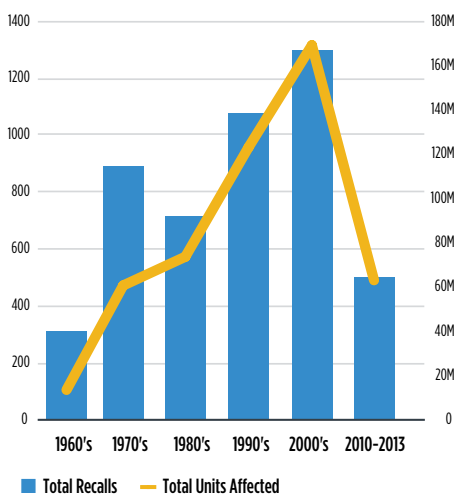
Source: CCC Information Services Inc.

**CCC INSIGHT**

Drivers and passengers of today's vehicles have seen a great deal of benefit from the advanced technology being incorporated into vehicles. For years much of the focus was on crash worthiness, with automakers reinforcing vehicle structures, adding crush zones, and numerous air bags to protect the vehicle occupants. Over the last several years, automakers and suppliers have focused a great deal of energy on crash avoidance technologies, and adding in features like navigation systems, WiFi, and other convenience items. As a result, when today's newest vehicles are involved in an accident, the repair is more complex than for older model year vehicles. This has created challenges and opportunities for both insurers and repairers.

**FIG. 29** Overall Vehicle Recall Trends by Calendar Year

(includes Ford, GM, BMW, Chrysler, Honda, Hyundai, Toyota, VW, and Volvo)



Sources: Source: Stout Risius Ross, Inc. "Automotive Industry: Warranty and Recall Annual Report." <http://www.saaautoleaders.org/files/189/189/84124.pdf>

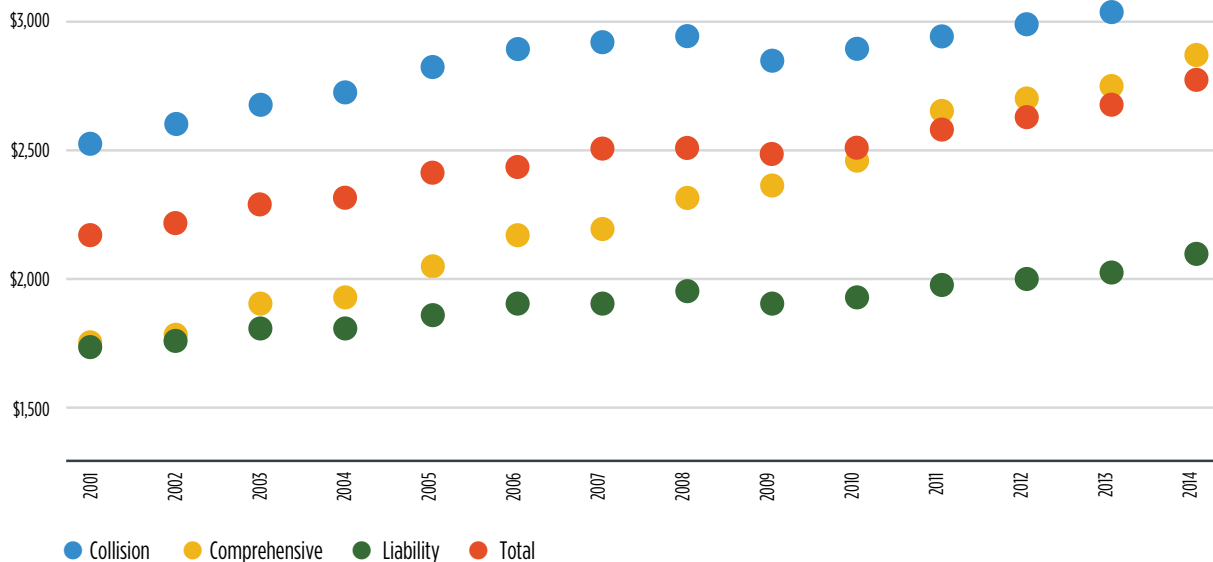


**Repair Costs Trend Up**

The average total cost of repair for vehicle appraisals in CY 2014 was \$2,685, up 3.4 percentage points from 2013. Repair costs are now accelerating at a rate consistent with what the industry experienced pre-recession. Comprehensive losses have seen the largest increase in average costs over the last several years, followed by collision and liability losses (*see Figure 30*).

FIG. 30

## CCC National Industry - Average Total Cost of Repairs Repairable Vehicle Appraisals by Loss Category CY01-CY14



Source: CCC Information Services Inc.

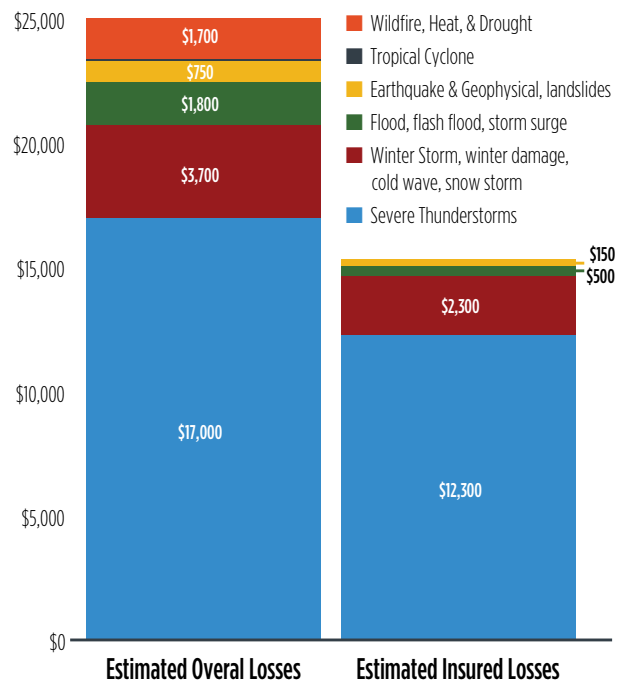
### Polar Vortex and Hail Drive Losses – Comprehensive Losses in Particular

Global natural disasters in 2014 resulted in \$110 billion in direct economic losses, and \$31 billion for insured losses.<sup>150</sup> 58 percent of those occurred in North America; U.S. insured losses were \$15.3 billion, well below the average of \$29 billion experienced annually from 2000 to 2013<sup>151</sup> (See Figure 31). Insured thunderstorm losses accounted for over 80 percent of the annual losses, totaling \$12.3 billion, the fourth highest annual total on record.<sup>152</sup> Winter storm losses in 2014 resulted in an estimated \$2.3 billion, or 15 percent of the total.<sup>153</sup> This was significantly higher than the annual average of \$1.25 billion between 1994 and 2013, where winter losses accounted for just over 6 percent of annual losses.<sup>154</sup>

The annual count of auto claims reported by CCC when normalized across its customers also shows significant increase in claim counts in those states hardest hit by the 2014 Polar Vortex (see Figure 32), and/or significant hail losses. Analysis of the over 12 million vehicle appraisals uploaded to CCC in CY 2014 shows growth in the share of appraisals with primary impact flagged ‘Hail’, ‘Fresh Water’, or ‘Salt Water’ to 2.1 percent of all losses, up from 1.9 percent in 2013 and down from the five-year peak of 3.5 percent in 2011. By state, hail and water loss share of volume varied significantly, signaling the impact of strong thunderstorms in the western and southeastern parts of the U.S. (see Figure 33). Nationally, PDR labor as a share of the Comprehensive average total cost of repairs increased to nearly 9 percent in 2014, versus 7 percent in 2013, while the percent of comprehensive losses with PDR labor increased from 13 percent in 2013 to nearly 15 percent in 2014.

FIG. 31

## Munich RE: Natural Disasters in the U.S. CY 2014 by Peril in million \$US



Sources: Munich RE. "NAT CATS 2014: What's going on with the weather?" January 7, 2015. www.iii.org."

FIG. 32

## Overall CCC Industry Claim Counts Up Five Percent in 2014

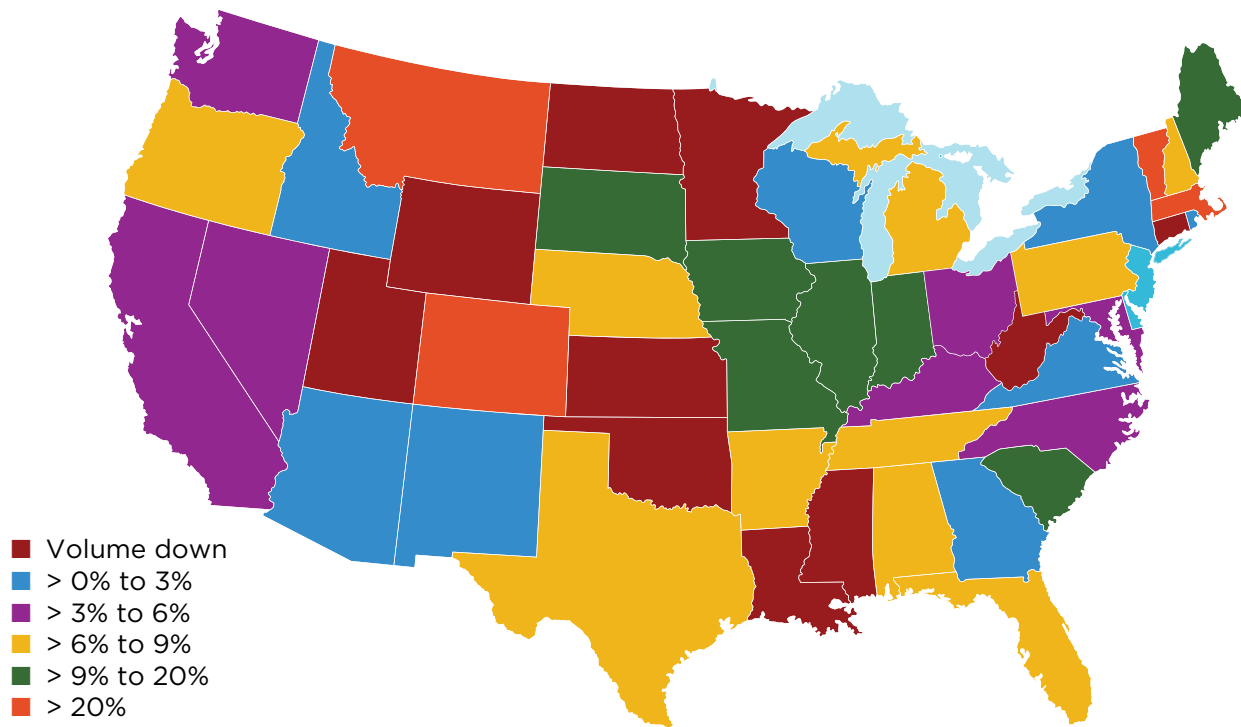
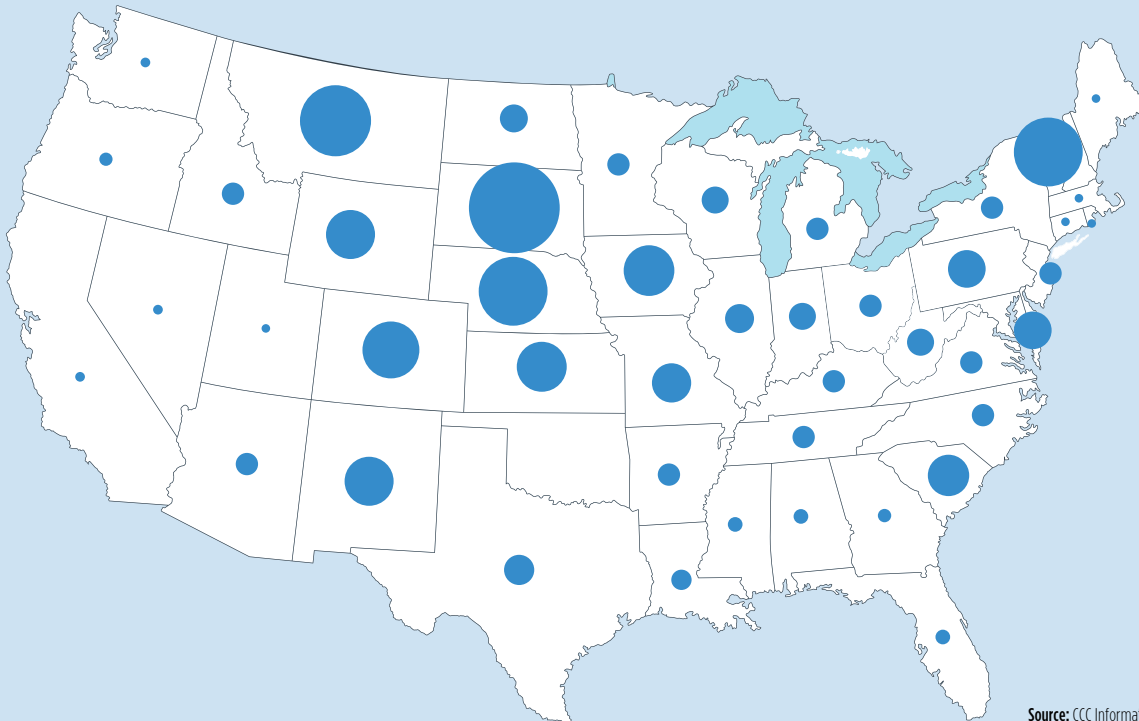


FIG. 33

## Share of Overall CCC Appraisal Count with Primary Impact of Hail or Water Loss CY 2014



## Polar Vortex and Hail Drive Losses – Comprehensive Losses in Particular

Collision and Liability losses saw repair costs increase three percent in 2014 from the prior calendar year. To better understand the dynamics behind the change in average repair cost, consider the primary components contributing to overall repair costs: parts and labor, and an analysis of the changes within the population of repaired vehicles in terms of vehicle age, manufacturer and type (see Figure 34).

**FIG. 34** CCC National Industry Repairable Vehicle Damage Appraisals: Vehicle Mix Statistics by Calendar Year

	2009	2010	2011	2012	2013	2014
Avg Repair Cost	\$2,399	\$2,425	\$2,497	\$2,551	\$2,596	\$2,685
% Chg from prior calendar year	-1.7%	1.1%	2.9%	2.2%	1.8%	3.4%
Avg Repair Cost - Driveable	\$1,788	\$1,809	\$1,901	\$1,928	\$1,965	\$2,053
% Chg from prior calendar year	-0.1%	1.2%	5.1%	1.4%	1.9%	4.5%
Avg Repair Cost - NonDriveable	\$4,544	\$4,526	\$4,607	\$4,765	\$4,920	\$5,051
% Chg from prior calendar year	-1.3%	-0.4%	1.8%	3.4%	3.3%	2.7%
Non-Driveable %	22.4%	22.6%	21.9%	21.8%	21.1%	20.7%
% of Claims with Suppl(s)	47.7%	47.1%	46.9%	47.2%	46.1%	45.8%
Suppl % of Total Repair Cost	10.4%	10.4%	10.7%	11.2%	12.0%	12.2%
Avg Vehicle Age	5.45	5.79	5.99	6.11	6.18	6.15
Avg CCC Regional Value Amt	\$12,444	\$12,851	\$13,133	\$14,280	\$14,999	\$15,024
Avg Odometer	76,696	80,412	82,634	83,875	82,711	83,757
Avg Mileage per Vehicle Year	14,077	13,899	13,792	13,726	13,373	13,616
Parts % Total Repair Cost	38.2%	38.2%	37.7%	38.2%	38.9%	39.3%
Avg # Parts Repl per Claim	7.8	7.9	8.0	8.3	8.7	8.9
OEM % of Total Part Amt	64.8%	63.4%	63.3%	63.1%	62.8%	63.9%
Labor % Total Repair Cost	42.8%	42.6%	42.8%	42.3%	41.9%	41.7%
Avg Labor Hrs per Claim	22.5	22.3	22.3	22.4	22.5	22.7
Avg Hourly Body Rate	\$43.86	\$44.61	\$45.01	\$45.50	\$46.13	\$46.70
% Chg from prior calendar year	1.8%	1.7%	0.9%	1.1%	1.4%	1.2%
Repair % Total Labor Amt	40.9%	40.8%	42.2%	41.8%	41.3%	41.3%
Total Loss % Vol	14.2%	13.7%	13.7%	14.2%	13.9%	13.9%
Collision Losses % Vol	53.1%	52.8%	51.8%	52.2%	53.5%	53.9%
Comprehensive Losses % Vol	16.5%	16.2%	18.4%	17.5%	15.9%	15.9%
Liability Losses % Vol	30.5%	31.0%	29.8%	30.3%	30.6%	30.2%
Collision Avg Repair Cost	\$2,794	\$2,807	\$2,857	\$2,909	\$2,963	\$3,051
% Chg Collision TCOR	-1.0%	0.5%	1.8%	1.8%	1.9%	3.0%
Comprehensive Avg Repair Cost	\$2,307	\$2,385	\$2,562	\$2,632	\$2,669	\$2,795
% Chg Comprehensive TCOR	5.1%	3.4%	7.4%	2.7%	1.4%	4.7%
Liability Avg Repair Cost	\$1,843	\$1,864	\$1,894	\$1,922	\$1,955	\$2,014
% Chg Liability TCOR	-0.9%	1.1%	1.6%	1.5%	1.7%	3.0%
Vehicles 7 Years & Older % Vol	33.7%	36.5%	38.8%	40.7%	42.2%	42.8%
Luxury % Vol	15.3%	15.7%	15.7%	15.9%	15.8%	15.6%

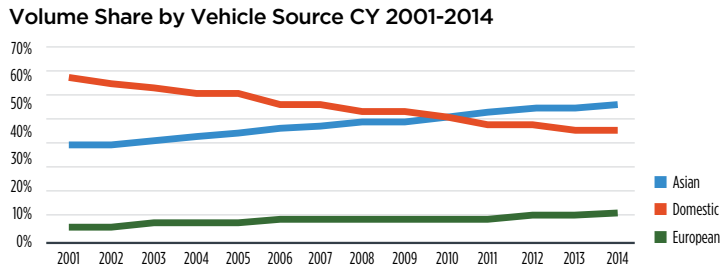
CCC Information Services Inc.



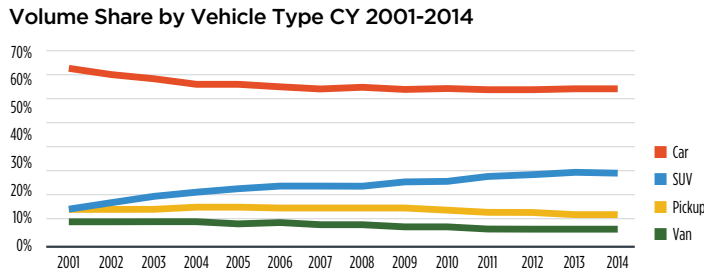
FIG. 35

## Collision Losses – Steady Vehicle Mix Change

Repairable Appraisal Volume



**-18.9%**  
Change in Domestic volume share CY14 vs. CY01



**+13.1%**  
Change in SUV volume share CY14 vs. CY01

Source: CCC Information Services, Inc.

### Younger Vehicles Making an Impact

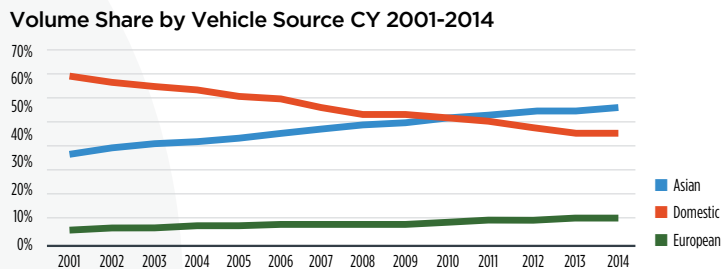
Prior issues of *Crash Course* have explored in detail how changes in consumer preference have led to significant changes within the vehicle fleet on the road in the U.S., and ultimately the vehicle mix within automotive claims. Although there has been some fluctuation year-over-year, the trend line has remained consistent over the last twenty or so years. Analysis of the vehicle appraisal data for Collision losses shows a decline in the Domestic vehicle share of repairable appraisal count of 18.9 percent points between CY 2001 and CY 2014, and a 13.1 percentage point increase in sport utility vehicles (*see Figure 35*).

Within liability losses a similar trend occurred – Domestic share declined 19.1 percentage points, while SUV volume share increased 11.8 percentage points between CY 2001 and CY 2014 (*see Figure 36*). SUV share has grown for all vehicle sources, with European vehicles nearly tripling their SUV share of volume, followed by Domestic and then Asian.

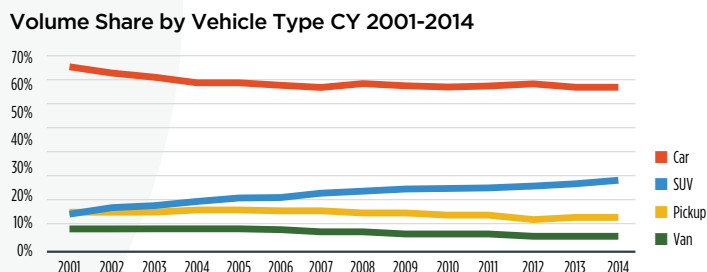
FIG. 36

## Liability Losses – Steady Vehicle Mix Change

Repairable Appraisal Volume



**-19.5%**  
Change in Domestic volume share CY14 vs. CY01



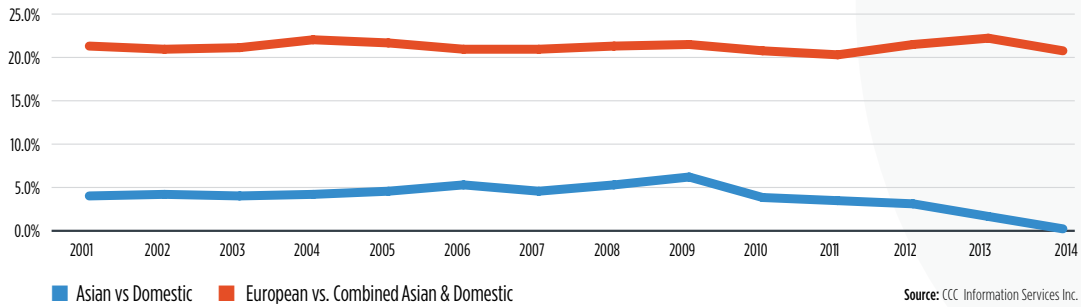
**+11.8%**  
Change in SUV volume share CY14 vs. CY01

Source: CCC Information Services, Inc.

FIG. 37

## Percent Difference in Average Total Cost of Repairs by Vehicle Source

Collision Losses – CY 2001 to 2014



Source: CCC Information Services Inc.

From a repair cost perspective, European vehicles consistently have an average total cost of repairs about 20 percent higher than that of Asian and Domestic vehicles. As the European manufacturers extend their models to incorporate lower cost smaller vehicles targeted at broader base of consumers, and Asian and Domestic manufacturers add more content to their vehicles, over time repairs costs have trended much closer (see Figure 37).

The recession resulted in significant disruption in new vehicle sales in the U.S. When compared to the 16.7 million average annual number of vehicles sold in the U.S. in the ten years ending CY 2007, the U.S. saw 22.2 million fewer new vehicles entering the vehicle parc (see Figure 38). The subsequent impact to auto claims was a significant rise in vehicles aged

7-years plus, and big drops in the newest vehicle age groups. Collision losses for vehicles aged current to six years saw a loss in volume share of 13.2 percentage points when comparing data for CY 2007 to CY 2014, while liability losses for vehicles aged 7-years plus increased 14.5 percentage point between CY 2001 and CY 2014.

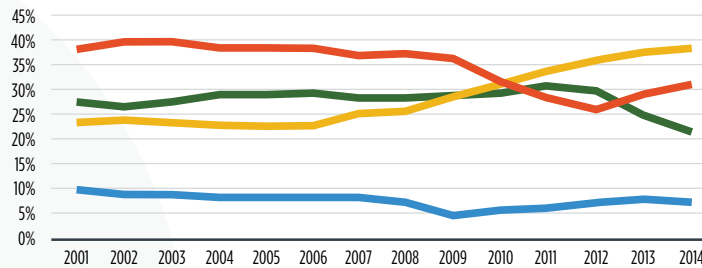
The vast majority of that aging occurred between 2007 and 2014 and fewer new vehicles entered the car parc.

The average age of repairable vehicles has typically risen about 1/10th of a model year since 2005. The exception to this was between 2008 and 2011 when the average age increased much faster (see Figure 39).

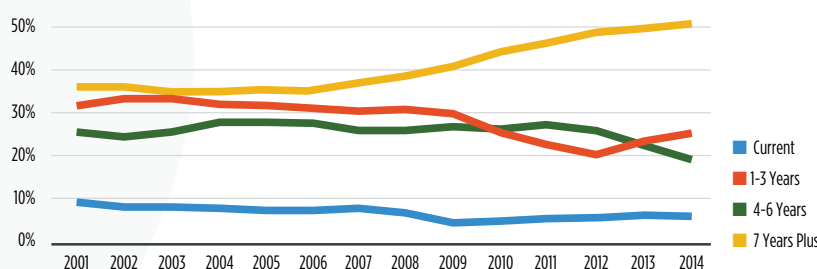
FIG. 38

## Collision and Liability Losses – Age Mix Changes Most

Collision Losses – Volume Share by Age Group CY 2001-2014



Liability Losses – Volume Share by Age Group CY 2001-2014

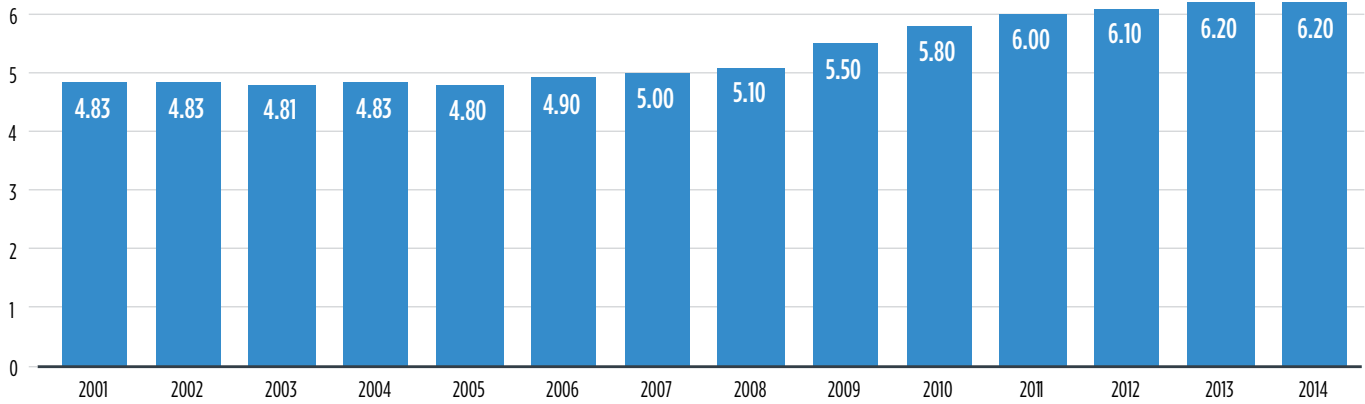


**-13.2%**  
Change in  
vehicles 1-6 years old  
CY14 vs. CY07

**+14.5%**  
Change in  
vehicles 7 years plus  
CY14 vs. CY01

Sources: CCC Information Services, Inc.

**FIG. 39** Average Vehicle Age – Repairable Vehicles (CY 2001 to 2014)



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
All Repairable Vehicles	0.00	0.00	0.00	0.00	4.80	4.90	5.00	5.10	5.50	5.80	6.00	6.10	6.20	6.20
Current Model Yr	-0.04	-0.03	-0.02	-0.03	-0.03	-0.04	-0.03	-0.03	-0.06	-0.06	-0.04	-0.05	-0.04	-0.03
1 - 3 Years Old	1.92	1.97	1.99	1.96	1.97	1.96	1.97	1.97	2.01	2.15	2.08	1.91	1.92	1.91
4 - 6 Years Old	4.95	4.91	4.89	4.86	4.93	4.94	4.93	4.94	4.93	4.94	4.94	4.98	5.12	5.04
7 Years and Older	10.01	9.94	9.97	10.00	10.00	9.95	9.93	10.01	10.13	10.24	10.34	10.45	10.55	10.62

Source: CCC Information Services Inc.

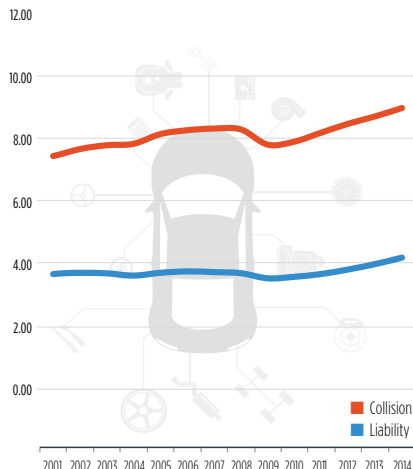
As of 2014, the average age appears to have peaked, and is expected to decline slowly in 2015 as more new vehicles enter the U.S. car parc. It's also worth noting that when comparing average vehicle age by age group, the average age has declined for all but the vehicles of 7-years plus, but even that oldest group appears to have plateaued.

With newer vehicles accounting for a growing share of repairable volume again, the industry is experiencing a reversal in some of the trends experienced during the recession. Specifically, newer vehicles tend to have more parts replaced, lower alternative parts utilization, and a lower repair percent of total labor spend. Throw into the mix the fact that vehicles overall have gotten more complex, and these trends accelerate even further. A comparison

of key appraisal statistics for calendar years 2001, 2009 and 2014 for collision and liability losses by vehicle age group underscores this trend (*see Figure 40*). Dollars for replaced parts as a share of total repair cost and the average number of replaced parts per claim have increased – particularly for newer vehicles. The impact of the recession is quite clear when comparing the trend in terms of parts replaced per claim in the years leading up to CY 2008 and 2009.

With the average price per part for newer model year vehicles tending to be more costly than for older models – either due to less competition or complexity of the part itself – the combination of more parts at a higher cost are a key factor driving up repair costs again post-recession.

**FIG. 40** Average Parts Replaced per Claim Collision and Liability Repairable Appraisals CY 2001-2014



**Collision and Liability Repairable Appraisals by Vehicle Age Group Calendar Years 2001 / 2009 / 2014**

Calendar Year	Vehicle Age Group	COLLISION LOSSES			LIABILITY LOSSES		
		Share of Overall Vol by Age Group	Parts % Total Repair Cost	Avg # Parts Repl per Claim	Share of Overall Vol by Age Group	Parts % Total Repair Cost	Avg # Parts Repl per Claim
2001	Current Yr	9.4%	42.3%	10.9	7.8%	39.1%	6.4
	1-3 Yrs	39.0%	41.9%	10.4	31.5%	38.3%	6.3
	4-6 Yrs	27.8%	40.5%	9.3	25.1%	36.7%	5.8
	7 Yrs Plus	23.7%	37.3%	7.0	35.5%	34.1%	4.5
	Total	100%	40.7%	9.3	100%	36.6%	5.6
2009	Current Yr	5.3%	43.0%	11.9	4.3%	37.7%	6.5
	1-3 Yrs	36.3%	42.4%	11.2	28.9%	37.5%	6.3
	4-6 Yrs	29.4%	40.7%	9.9	25.9%	36.1%	5.8
	7 Yrs Plus	29.1%	37.1%	7.3	40.8%	32.1%	4.4
	Total	100%	40.7%	9.7	100%	35.2%	5.4
2014	Current Yr	7.7%	46.7%	13.2	6.2%	41.1%	7.6
	1-3 Yrs	31.5%	44.2%	12.4	24.9%	38.4%	7.2
	4-6 Yrs	22.2%	42.0%	11.6	18.9%	36.6%	6.7
	7 Yrs Plus	38.7%	39.2%	8.8	50.0%	33.4%	5.1
	Total	100%	42.3%	10.9	100%	36.0%	6.1

Sources: CCC Information Services Inc.

## Vehicle Design Driving Part Replacements

Technology and consumer demand are driving the numerous changes to vehicle design, including use of new materials and devices such as aluminum, sensors and cameras to aid in driver warning or active safety, and infotainment options. As more vehicles on the road include crash avoidance technologies, the prevalence of components such as cameras and sensors grows. At its most basic, a single vehicle might have wheel speed sensors, steering wheel position sensors, and yaw sensors used by the electronic stability control system (ESC – government made mandatory for all MY 2012 vehicles forward), and a camera mounted under the rear-view mirror for a forward-collision warning or avoidance system. Given the relatively slow rate at which crash avoidance systems are entering the fleet, the overall impact from a physical damage repair cost perspective has been relatively minor.

Analysis of repairable appraisal part level detail reveals the cost of replacing these types of sensors and cameras amounted to only 0.6 percent of the overall part spend in CY 2014 – although this has increased from 0.4 percent in CY 2009 (see Figure 41). And while one-half a percent may not seem like much, the net result is over \$6 per claim additional cost, which will only grow as the number of sensors grows and the cost of these parts continues to increase rise, which they have at an average rate of 5% annually over the last five years. Where automakers choose to place these sensors will also potentially drive up replacement. For example, the sensors for the blind-spot monitoring system for the 2015 Ford F-150 are integrated into the rear taillight which is sold as a single assembly.<sup>155</sup>

FIG. 41

## Cameras & Sensors Share of Part Count and Part Spend CY 2010-2014

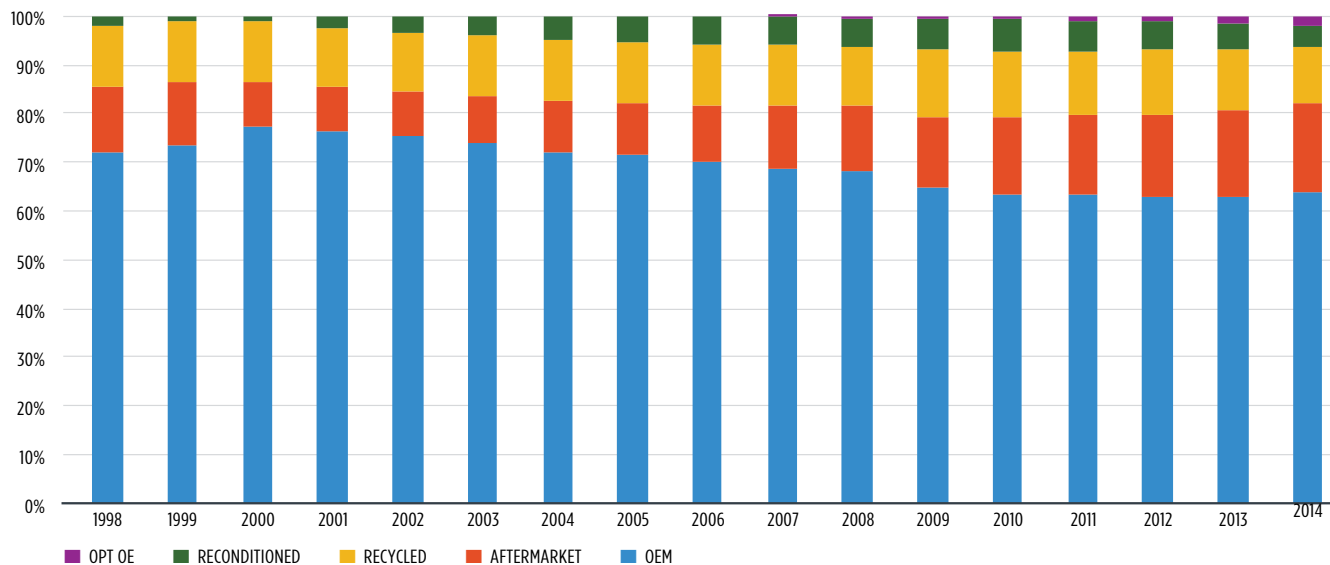
	% of Total Part Count			
	Collision	Comprehensive	Liability	Total
2010	0.42%	0.17%	0.36%	0.36%
2011	0.44%	0.16%	0.39%	0.38%
2012	0.47%	0.19%	0.41%	0.41%
2013	0.50%	0.21%	0.44%	0.44%
2014	0.52%	0.23%	0.47%	0.46%

	% of Total Part Spend			
	Collision	Comprehensive	Liability	Total
2010	0.42%	0.20%	0.44%	0.39%
2011	0.46%	0.20%	0.49%	0.42%
2012	0.53%	0.26%	0.54%	0.49%
2013	0.60%	0.32%	0.60%	0.55%
2014	0.64%	0.34%	0.66%	0.59%

Source: CCC Information Services Inc.

FIG. 42

## CCC National Industry – Percent of Total Part Replacement Dollars by Part type CY 1998 to 2014



Source: CCC Information Services, Inc.

### Non-OE Part Utilization Grows for Older Vehicles

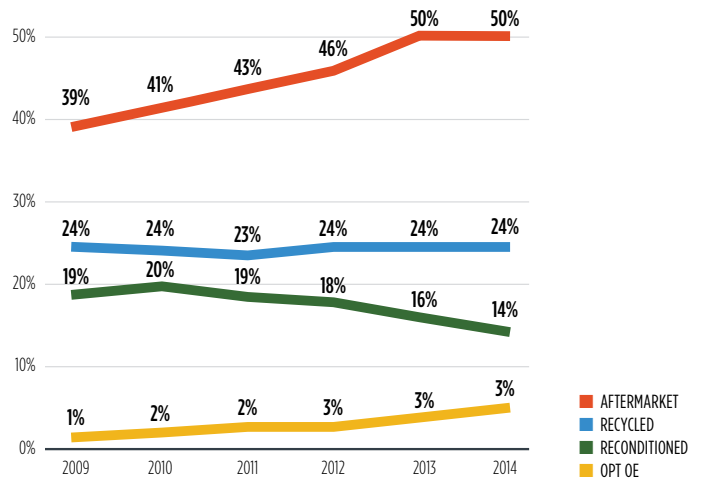
Non-OE part utilization as a share of total replaced part spend lost some ground in 2014, as the share of vehicles current to three years of age gained volume share (see Figure 42). Among the other market drivers of OEM part utilization are an increase in model redesigns and increases in price matching by the OE's. According to data from NADA, 34 redesigned models will be released for the 2015 model year, significantly more than the average number of 22 redesigns annually since 1989.<sup>156</sup> 2007 was the only other model year that saw a higher number of model redesigns with 41.<sup>157</sup>

Worth noting however is that non-OE share of overall part spend is still higher than mid-2000's before the vehicle fleet aged significantly during the recession. Additionally, aftermarket share of spend continued to grow in 2014, as did the share of appraisals that included at least one aftermarket part (see Figure 43).

### Laboring Away

When combined, overall non-paint and paint labor accounted for just below 43 percent of the total cost of repairs in 2014, which has changed little over the last fifteen-plus years (see Figure 44). The average number of labor hours per appraisal uploaded to CCC in 2014 was up slightly, and the average hourly rate for sheet metal or body labor was up 1.2 percent versus 2013. The hourly labor rates have seen moderate increases year-over-year during the recession, closing out 2014 up just over one percent (see Figure 45).

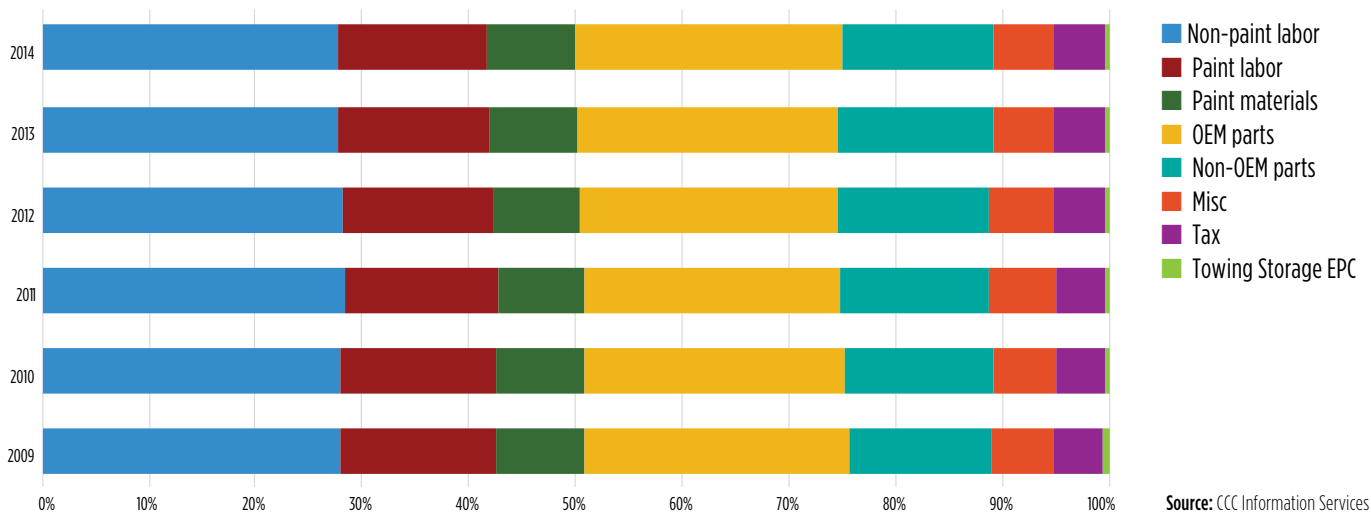
**FIG. 43** Percent of Repairable Vehicle Appraisals with Non-OE Parts by Part Type CY 2009-2014



Source: CCC Information Services Inc.

An increase in newer model year vehicles and higher average part counts per claim has also had an impact on the industry's repair labor dollars as a share of total labor spend. A comparison of some of the top volume parts by vehicle age group shows lower repaired part counts for the newer model year vehicles than the older (see Figure 46). With a shift towards newer vehicles overall repair part counts go down, and with them the repair labor hours; if at the same time more parts replacements are made, a greater share of labor goes to replace.

**FIG. 44** CCC National Industry - Repair Dollars Distribution by Category (CY 2009-2014)



Source: CCC Information Services Inc.

FIG. 45

## CCC National Industry Average Labor Rates per Labor Category CY 2010 to CY 2014

Calendar Year	Average Hourly Rate (weighted average)					% Change from Prior Year				
	Body (Sheet Metal) Labor	Frame Labor	Mechanical Labor	Paint Labor	Paint Materials	Body (Sheet Metal) Labor	Frame Labor	Mechanical Labor	Paint Labor	Paint Materials
2010	\$44.61	\$51.18	\$73.27	\$44.51	\$25.39	1.4%	1.6%	0.6%	1.4%	2.6%
2011	\$45.01	\$51.75	\$74.41	\$44.95	\$25.70	0.9%	1.1%	1.6%	1.0%	1.2%
2012	\$45.50	\$52.09	\$75.64	\$45.43	\$26.17	1.1%	0.7%	1.7%	1.1%	1.8%
2013	\$46.12	\$52.43	\$77.04	\$46.04	\$26.64	1.4%	0.7%	1.8%	1.3%	1.8%
2014	\$46.70	\$53.34	\$78.21	\$46.62	\$27.12	1.3%	1.7%	1.5%	1.3%	1.8%
<b>5-Year Average</b>						<b>1.2%</b>	<b>1.1%</b>	<b>1.4%</b>	<b>1.2%</b>	<b>1.9%</b>

Source: CCC Information Services Inc.

FIG. 46

## CCC National Industry - Repairable Appraisals CY 2014 by Vehicle Age Group Top 15 Repaired Parts -

Repaired % of Total Count of Repaired and Replaced Parts

	Vehicle Age Group				
	Current Yr or Newer Group	1 - 3 Years Old	4 - 6 Years Old	7 Years and Older	Total
	2014	2014	2014	2014	2014
QUARTER PANEL Quarter panel	85%	86%	87%	89%	87%
FENDER Fender	45%	47%	48%	48%	48%
REAR BUMPER Bumper cover	43%	45%	43%	41%	43%
FRONT DOOR Outer panel	83%	83%	85%	89%	86%
FRONT BUMPER Bumper cover	31%	29%	28%	29%	29%
REAR DOOR Outer panel	78%	79%	80%	86%	82%
HOOD Hood	39%	40%	40%	43%	41%
REAR BODY & FLOOR Rear body panel	63%	63%	66%	71%	66%
FENDER Apron assy	84%	85%	87%	89%	87%
PICK UP BOX Side panel	73%	76%	74%	75%	75%
LIFT GATE Lift gate	54%	56%	58%	60%	58%

Source: CCC Information Services Inc.



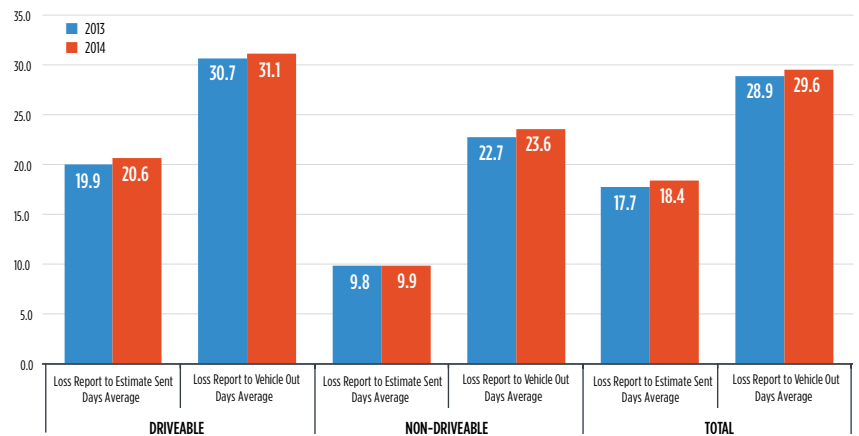
## Transparency in Claims, Data

Numerous studies have been completed over the years that show consumer satisfaction with auto insurance companies is tied to their satisfaction with the vehicle repair. Consumers say they want more visibility throughout the claim and repair process, and prefer information be pushed to them on the device and at the time of their choosing. More and more insurance DRP programs are shifting to a model where cycle time management and claim satisfaction is a shared responsibility between the insurer and the repairer, often using mobile and digital technology to enable automatic updates to all parties.

Historically carriers have measured cycle time from the point where the customer reported the loss to the date the original estimate of record was uploaded. If repair time is included as part of overall cycle time, an average of ten additional days are counted to arrive at the final cycle time (*see Figure 47*). Having the ability to manage the time spent during each portion of the claim and repair helps identify areas where improvements to processes exist. Proactive management of overall cycle time can improve shop productivity both in terms of labor hours per repair day but also labor hours per shop day (*see Figure 48*). However, visibility across the entire process is just as critical, specifically being able to manage from the time the customer actually reports the loss to the time the customer has picked up their vehicle.

By managing the differences between the planned and actual events for key process steps such as vehicle in, repair start, repair complete and vehicle out, repairers can shave time off of the claim and repair process and streamline communication between all parties. The ability to provide customers with dates that don't change a great deal throughout the process can also lead to better customer satisfaction. In 2014, just over 35 percent of all repairs were delivered based on the original date promised.

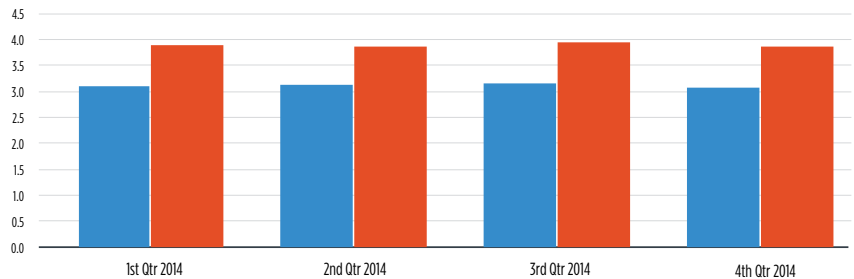
**FIG. 47** DRP National Industry Repaired Vehicle Cycle Times - Loss Report to Estimate Upload and Loss Report to Vehicle Out



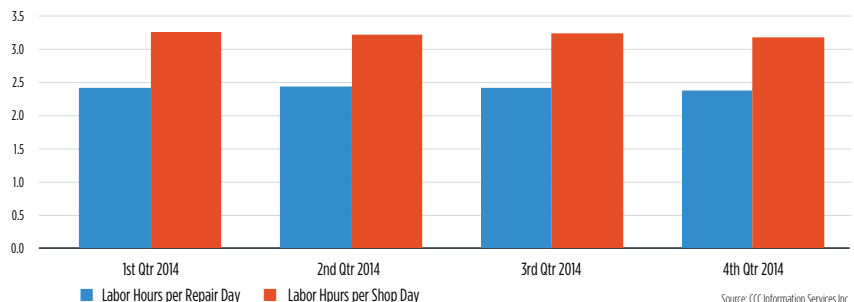
Source: CCC Information Services Inc.

**FIG. 48** Repair Cycle Times for DRP Appraisals, CCC National Industry CY 2014 by Quarter and Driveable Flag

CCC National Industry - DRP Driveable Repairable Vehicles



CCC National Industry DRP Non-Driveable Repairable Vehicles



Source: CCC Information Services Inc.

## CCC INSIGHT

By scheduling customers in when collision repair facility staff is available to begin repairs immediately, and communicating regular updates to the customer during the repair so vehicle pick-up can be arranged as close to repairs complete as possible will not only help reduce the overall repair cycle time but also lead to better customer satisfaction.

## Older Vehicles are Hanging Around

The aging vehicle fleet has been a major driver behind the increase in vehicle total loss frequency over the last several years. According to data from Experian, despite stronger new vehicle sales over the last several years, lower scrappage rates mean that vehicles aged 7-years plus still account for more than 70 percent of all vehicles in operation in the U.S.

In 2000, about 9 percent of all vehicles for which an appraisal was written were flagged as a total loss; by 2014, this number had grown to 14 percent (Taking into account obvious totals where no appraisal is written, the industry-wide total loss percentage trends potentially 5 percent higher [14 percent in 2000 to 19 percent in 2014]). A comparison of the share of appraisals flagged as a total loss by vehicle age group shows very little change within each age group over the last 10 years; what has changed is the share of vehicles within the oldest age group. Because the total loss frequency is highest for vehicles aged seven years or more, a growth in volume share of these vehicles from 32 percent in CY 2001 to 47 percent in 2014 is a primary factor driving up total loss frequency overall (see Figure 49).

Total loss frequency remained elevated in 2014 as claims volume (like the U.S. vehicle fleet) remained skewed towards older vehicles. Record low scrappage rates mean the U.S. will continue to see many older model year vehicles still on the road, despite increases in new vehicle sales. The outlook for 2015 remains the same – total loss frequency will remain high until new vehicle purchases help drive down the average age of vehicles on the road in the U.S.

## Total Loss Values Moderate

Total loss vehicle values experienced moderate increases in 2014, with current model year vehicles (higher average industry MSRP's) (see Figure 50) and vehicles 7-years plus (see Figure 51) experiencing the largest increases. Comprehensive total loss values saw the largest increases, reflecting the impact of numerous large hail losses in states such as Colorado and South Carolina.

Increases in used-vehicle supply in 2015 for newer model year vehicles from lease and rental returns should help temper prices on younger model year vehicles. The continued shift in consumer taste to light trucks, specifically full-size pickups, crossovers, and SUVs, as well as luxury vehicles will, however, continue to raise the average vehicle value.

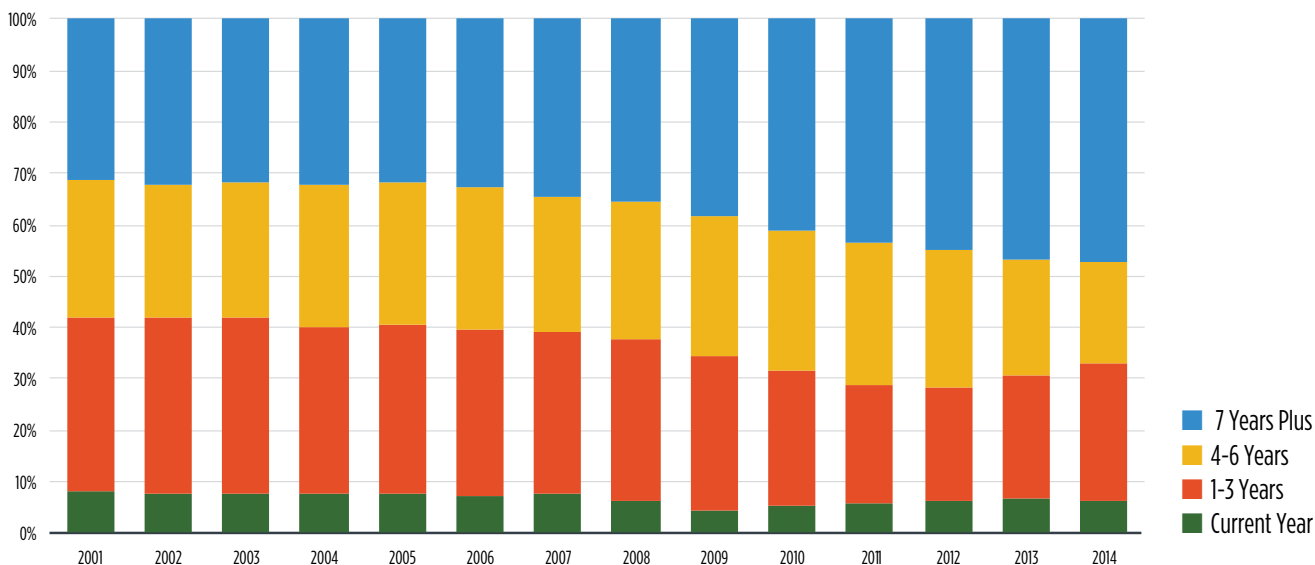
With more than 70 percent of total losses for vehicles aged 7-years plus, where increases in subprime buyers continues to drive demand and therefore price, expect total loss values to remain elevated or flat in the coming year as well.

### CCC INSIGHT

With total loss frequency still elevated, many consumers will be faced with the need to potentially replace a vehicle at a time when longer term loans, higher new and used vehicle prices may mean they do not have the financial means to replace.

FIG. 49

## CCC National Industry Overall Claim Count: Volume Share by Vehicle Age Group CY 2001-CY 2014

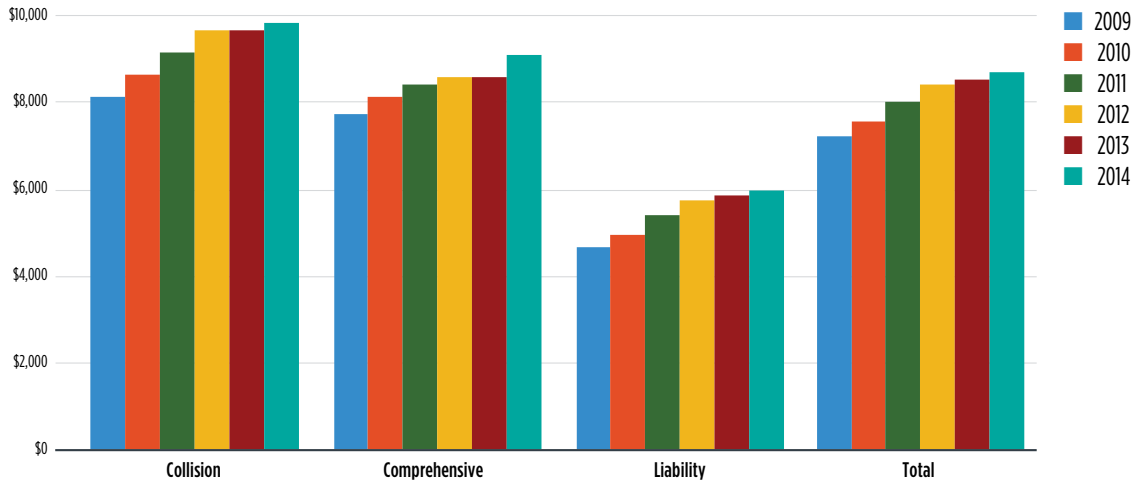


Source: CCC Information Services Inc.

FIG. 50

### CCC National Industry Final Valuation Amount Average for Total Loss by CY and Loss Category and Percent Change

Y/O/Y CY 2009 to CY 2014



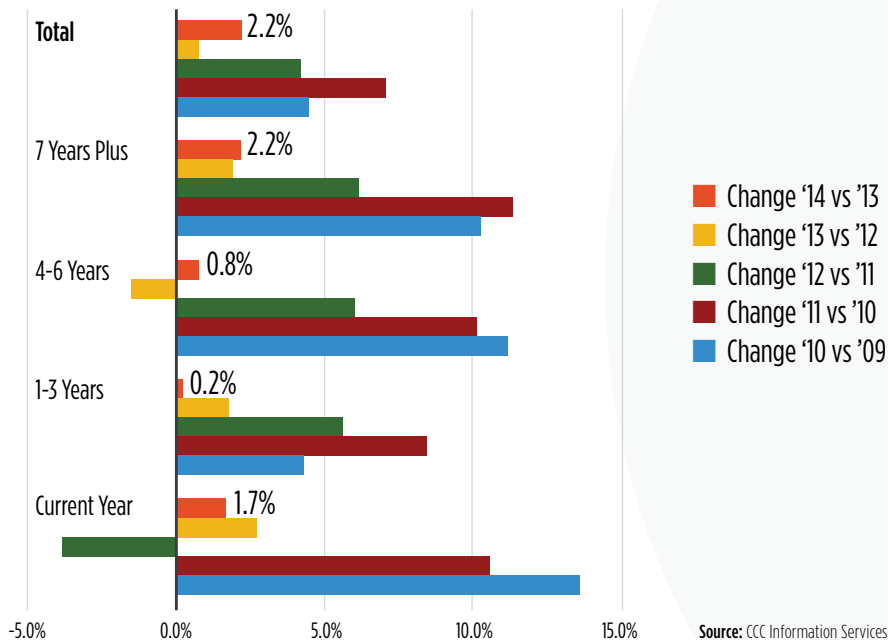
	Collision	Comprehensive	Liability	Total
% Chg '10 vs '09	6.0%	5.8%	6.3%	4.8%
% Chg '11 vs '10	5.8%	3.5%	9.7%	6.6%
% Chg '12 vs '11	5.5%	1.5%	6.3%	4.9%
% Chg '13 vs '12	0.4%	0.5%	1.7%	1.1%
% Chg '14 vs '13	1.2%	5.5%	2.3%	2.0%

Source: CCC Information Services Inc.

FIG. 51

### Total Loss Vehicle Values by Vehicle Age Group:

Change from Same Period Prior Year CY 2009 to CY 2014



Source: CCC Information Services Inc.



# The Road Ahead

We are 'Back to the Future' in a digitally charged world, where every aspect of people's lives has been influenced. Technology has become a game-changer for all companies – "All companies are now software companies."<sup>158</sup> All customers now have expectations that the technology they use can also be used by the companies with which they do business to connect with them, gather customer feedback, and adapt their products and services to facilitate their interactions with them.

The economy has improved, and consumers are again buying vehicles and driving at pre-recession rates. Carriers and repairers are adapting once again to increases in frequency and repair costs, and must also ensure they have the necessary training and tooling to repair the increasingly complex vehicles being driven today.

Today's business imperative is that companies master their use of the tools best suited to survive in this new world, whether that is data and analytics, social, cloud or mobile, or a combination thereof.

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# 2015 Crash Course

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