

## Technology is making your car depreciate faster than ever

It may not be news to you that the new car you just bought will depreciate the moment you drive it off the lot. But what might surprise you is how much of its value current and recent new cars will lose as opposed to what occurred in past years—and why.

How much more it will lose is not precise, other than to say it is by quite a lot. The answer to why is more straight forward. The culprit is technology, in two key areas—safety and a shift to alternative fuels, primarily electricity.

The happy news, of course, is that technology has made cars safer, more efficient, and more comfortable.

Starting in the mid-'90s, car safety has been improving dramatically with such features as anti-lock brake systems (ABS) and supplemental restraint systems (airbags). Since then, even more features have moved into wide distribution at an even greater pace. Some examples include:

- Tire pressure monitor systems.
- Backup cameras (and displays).
- Backup side sensors.
- Blind spot monitors in the mid to late 2000s.
- Lane departure warning systems (LDWS) in the early to mid 2010s.
- Tailgating warning systems.

No one is likely to quarrel with the importance of all those features. But as these safety features are added year by model year, they create greater downward pressure on the value of the previous year's cars. Now, not only are they last year's models, but they are also missing valuable safety features available in the new models.

Nor are automotive changes slowing down. In addition to more traditional safety improvements, there will continue to be incremental features development and deployment toward autonomous driving for the next 5-10 years, which will further increase this downward pressure.

An additional contributor to your new car's depreciation is the increasing pace of electrification. The conversion from internal combustion engine (ICE) vehicles to battery powered ones reduces the value of not only ICE powered cars, but today's battery powered cars.

About 40% of an electric car's value is tied up in its battery. That's much like the not-quite-early personal computers stage during which a large part of the value was tied up in the CPU and the operating system. Most of the rest of the early PC components had multiple sources for such things as storage and memory. The pace of innovation was defined by the performance of the CPU, followed by OS features and then data storage and memory. As these core capabilities, which enabled new and valuable computing features, were available on shorter and shorter cycles, the previous year's PCs depreciated at faster rates.

The biggest sales challenges for electric cars are range anxiety (how can I be sure I can recharge when I need to?) and the companion recharge cycle (how frequently do I need to

recharge?). The focus on improving battery technology reflects past periods during which early PCs became old technology in 3-4 years. Currently, incremental improvements of existing battery technology are being made by different new and legacy automakers. One focus has been improving the power density to weight ratio to increase range so that electric cars can be competitive with ICE-powered cars in terms of range.

The electric car industry's current focus is on getting solid state batteries into production in the next four years. That time frame is significant because it matches the average frequency with which car owners replace their cars with new cars. A new electric car in the mid '20s likely will have either enough battery power to compete with the current ICE car range or be equipped with solid state batteries to reduce its weight, to meet the existing ICE car range, and to significantly reduce its charge time. Those improvements will drastically change how electric car total cost of ownership is calculated. The challenge for electric car companies, as they make their cars more competitive, will be to ensure they get a return on their investments. Those companies will have a choice to make that Tesla has not had to make so far. They will need to extend beyond the high-end consumer to penetrate the middle of the market. To do that, those electric car companies will need to price their cars in a range that an average consumer can afford, much in the way today's ICE automobiles are priced.

Pricing electric cars so that they fit middle class budgets will have the potential for putting even more pressure on car depreciation of existing cars. But the key will be how well electric car makers manage pricing against their internal ROI and competitors. Not having to buy gasoline should be a real incentive for would-be buyers, but sticker shock could still offset that benefit. The rate of change in automobiles today is higher than it's ever been. Historically, change revolved around performance and style. Performance could be gas efficiency and/or sporty driving capabilities augmented by creature comforts. Style was and continues to be a key element of car marketing and purchasing decisions. Even buyers who are looking for a car whose purpose is primarily performing the task of transportation are easily swayed by style when reaching a purchasing decision.

Change is occurring at an increasing rate that has already brought a myriad of safety and other new features and components that will eventually lead to semi or fully autonomous driving, in addition to standalone battery powered cars and ICE augmented battery power. All of that means next year's car will have more valuable features than this year's at a comparable price. That, of course, depreciates the value of this year's and last year's cars at an even greater rate than before.