



The Unforeseeable and Incalculable: The \$2 Trillion Transportation Sector Change is Coming

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Key Insights

- 1 Learn about autonomous driving as an investment opportunity.
- 2 Discover the companies that are well positioned to prosper during the autonomous driving revolution.
- 3 Understand how autonomous driving could disrupt and transform the automobile industry.

Introduction

You may have heard about the coming autonomous driving trend. An autonomous vehicle is defined as a motor vehicle that uses artificial intelligence, sensors and global positioning system coordinates to drive itself without the active intervention of a human operator.

- *What does this mean for the automobile industry?*
- *Which companies are likely to be the winners and the new leaders in this major industry change?*

It is still early in the development of this technology so there are no sure bets today, but there are certain indications that a few companies are likely to be at the forefront of the new technologies.

- ▶ **This report attempts to explain the coming investment opportunities in the transportation revolution.**

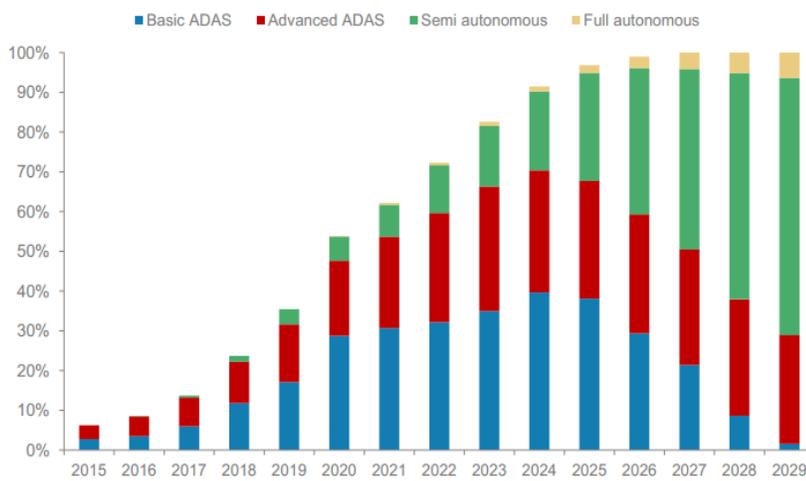
Autonomous Driving

Autonomous driving and electric automobile power is coming to a car in your future for two important reasons: safety and economics. The car is soon turning into a digital machine—the analog combustion engine platform will be replaced with a much more efficient electric vehicle. It is not well known that the electric motor is about 4 to 5 times more efficient than the combustion engine. How is this possible? Since you have been driving a combustion engine for decades, you are aware that the engine consumes fuel the entire time the engine is operating. This combustion engine technology is close to 100 years old. The new electric platform uses an electric motor that consumes power only when the car is moving. It has been estimated that the electric motor is 80% more efficient than the combustion engine. The combustion engine is estimated to lose 80% of its energy compared to a 20% loss from the electric motor.

As an investor, pay attention when an industry worth more than \$2 trillion a year is on the cusp of a significant change.

Therefore, we believe electric vehicles have a good chance of being a new and significant automobile platform. As an investor, you should pay attention when an industry worth more than \$2 trillion a year (close to 100 million cars produced globally with average value of \$20,000) begins a major change. We believe the move toward the electric digital car with autonomous driving features is well underway. The new leaders in this change will create billions in value for forward-thinking investors. More importantly, if the electricity that operates the vehicle can be produced via solar, wind, hydro or other green power, then the vehicle becomes fossil fuel free.

Morgan Stanley Global ADAS/Autonomous Penetration Model



Source: IHS, Morgan Stanley Research

Morgan Stanley analysts estimate that in 7-8 years 35% or more of automobiles sold will have semi-autonomous capabilities and 60% or more will have Advanced Driver Assist Systems (ADAS) and autonomous driving capabilities. By 2025, close to 5% of vehicles will be fully autonomous.

What companies are best positioned to prosper from the autonomous driving revolution?

Tesla Inc. (TSLA)



Most people know Tesla to be the leader in the development of the electric vehicle. Tesla produced almost 80,000 electric vehicles in 2016 and is running at nearly a \$10 billion annual revenue rate. We expect that this revenue rate could triple and exceed \$24 billion in 2018, as we believe Tesla will produce more than 400,000 vehicles, with the majority being the mass-market car: the new Model 3. Note that the company has a stated goal to produce 500,000 vehicles in 2018; however, they have a history of missing goals slightly – so I think they could miss that goal by 20%.

The Model 3 had the unique distinction of being the only vehicle to ever attract 400,000 customer pre-orders of \$1,000 each. This fact gives you a clear idea that the American public is ready for a good, low-cost, clean, green car. Tesla has committed to providing advanced autonomous features in all their Model 3 vehicles. Initially, they will not be fully autonomous (i.e. self-driving) – however, we believe in five to ten years, fully autonomous driving will be common. In fact, the company has stated that all Model 3 vehicles will come equipped with the autonomous capabilities so customers can activate the capabilities when the car is available. Tesla also is readying a mobility project that will be an automobile-sharing service, which would make autonomous vehicles available to those who want to use a vehicle but not own one. This service is still several years away; however, expectations are that this could be a very good business. It is important to note that we believe two key drivers are creating this industry change: safety and economics. We believe the insurance industry will encourage and accept the autonomous vehicle for two good reasons – one, it saves lives, and for the insurance industry, it will boost their profits when they pay out reduced collision and medical coverage claims. Tesla, we believe, is one of the best-positioned technology companies in the world today to benefit from the coming changes in the transportation industry, globally.

Estimated Reduction in Insurance Claims from ADAS

Claim Type	FCW	FCW & AEB
Property Damage Liability	7%-13%	10%-15%
Bodily Injury Liability	4%-24%	14%-35%

Source: Highway Loss Data Institute, HIS, Morgan Stanley Research

Advanced Driver Assist Programs (ADAS) including Forward Collision Warnings (FCW) and Automatic Emergency Braking (AEB), will be key drivers in building the bottom line for insurance companies. Reduction in claims of 10-35% is expected. These industry-wide savings cost savings are a huge driver behind digital assisted and autonomous driving.

Nvidia (NVDA)



Nvidia designs, develops, and markets three-dimensional (3D) graphic processors and related software. The company's products provide interactive graphics to the mainstream computer markets, including the gaming industry, the data center, artificial intelligence (AI) applications, virtual reality applications, machine language applications and finally, the automobile autonomous driving market. What is unique about Nvidia is that they currently have about 72% of the market share for the gaming industry CPU business. This gives you the idea that they are good at their business. However, the size of the newer applications including the data center artificial intelligence, virtual reality, and the automotive autonomous driving business are all HUGE!

Goldman Sachs has estimated that the total addressable market for AI/Machine Language hardware alone could be worth \$5-10 billion. This of course is just one of their applications. In fact, it is my belief that the automobile opportunity, the data center, the virtual reality, and other AI applications all have a market size in the \$3-5 billion range in the not too distance future. What is impressive is the fact that Tesla motors has partnered with Nvidia to use its capabilities to power the autonomous driving feature for the Tesla Model 3 – which is scheduled to produce close to 400,000 units or more in 2018.

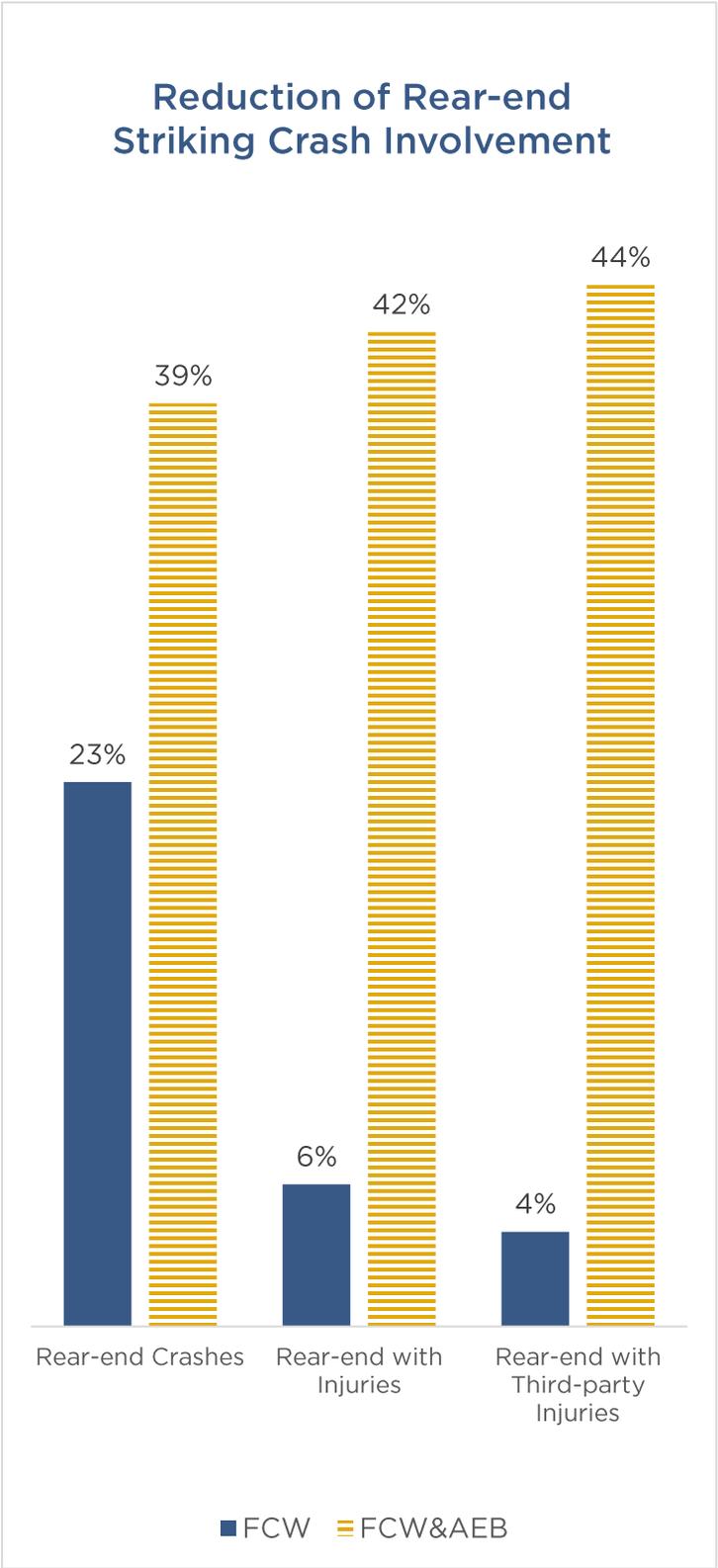
Some companies just have all the luck and seem to have all the capabilities at the right time to be able to dominate and lead a whole wave of technology. A little company called Intel (INTC), which went public in 1980, dominated for two decades by owning the capabilities of the central processing unit (CPU) of the personal computer market. We believe Nvidia today is positioned similarly to own the next generation of graphic computer processing, which is critical to all AI applications, data center management, autonomous driving and many other AI-type applications. In short, Nvidia is in the “catbird seat” for a whole new generation of innovation.

Five Large Market Opportunities:

1. **Autonomous Driving**
2. **Artificial Intelligence Application**
3. **Server networks and the Data Center**
4. **Virtual Reality Applications**
5. **Gaming Application**

The valuation today for Nvidia is a healthy \$62 billion, which may seem high for a company with \$7 billion in revenue expected in 2017. What is important to remember about most of these new industry AI applications, like the Tesla one, is that they are still in the early days. We feel Nvidia could go through a very fast-growing cycle of 50% -100% or more in the coming quarters and years. Yes, there is competition; however, Nvidia is the clear leader in many markets today. We do not expect that to change. The market today is pricing in some of the Unforeseeable and Incalculable, which is simply the way markets work. Expect a very volatile ride with large corrections; however, the opportunities before Nvidia are simply breathtaking. If they can capitalize on just a few of them, this company will be a very important company. Use any downside volatility to increase your position or begin a new position. Today we judge Nvidia to be a uniquely positioned company that could dominate the next wave of Artificial Intelligence applications.

Advanced Driver Assist Systems like Forward Collision Warning (FCW) and Automatic Emergency Breaking (AEB) can reduce rear-end strikes by 40 percent or more.

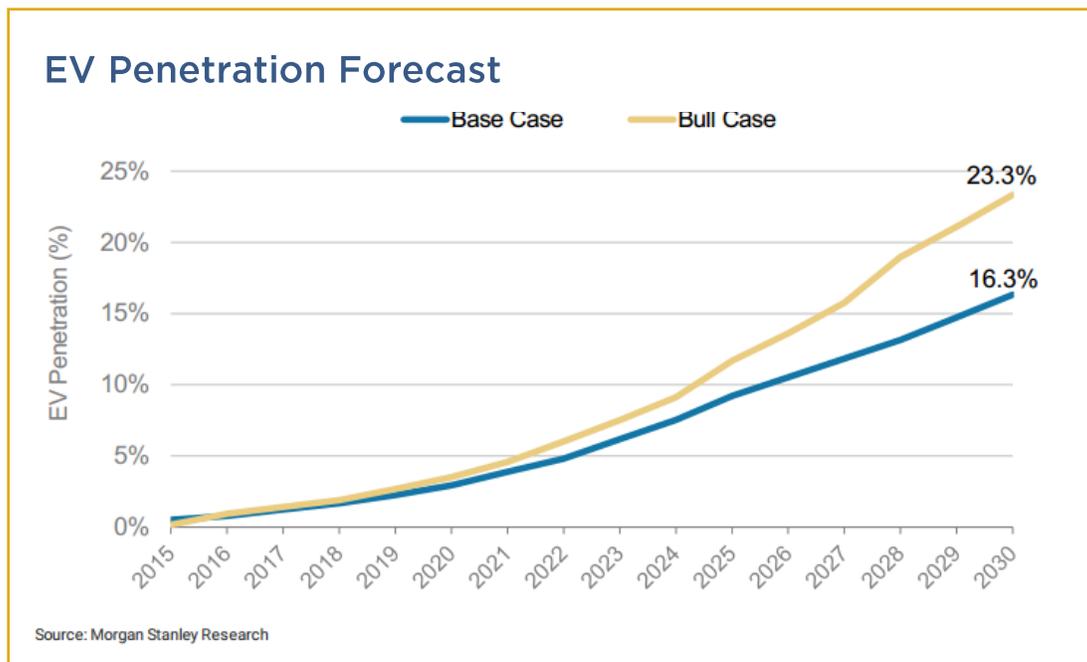


Mobileye (MBLY)

Mobileye N.V. is an Israel-based company that provides image sensing and processing technology for automotive advanced driver assist systems that offer warnings for collisions and prevents them. Mobileye leads in this category today – they have close to 80% market share. The key problem for Mobileye is that they have many capable competitors ready to take their business away. We are mildly interested in owning Mobileye because they could come out with new technology or leverage their existing strong market position into something significant. The market has voted negatively on this prospect as Mobileye has lost its momentum and now looks like a mature company. The stock is no higher today than it was in 2014, which is not a good sign. There is a slim possibility that this could change, so monitor and watch this one carefully. Stay tuned.

It is not that common to have a \$2 trillion industry like the automobile market encounter a dramatic change in technology. This opportunity should be large with significant duration.

The \$2 trillion estimate is for only the passenger automobile market – this ignores commercial trucking, buses and other commercial applications. The ultimate transportation market may be much larger than \$2 trillion. We will continue to look for the leaders in this space.



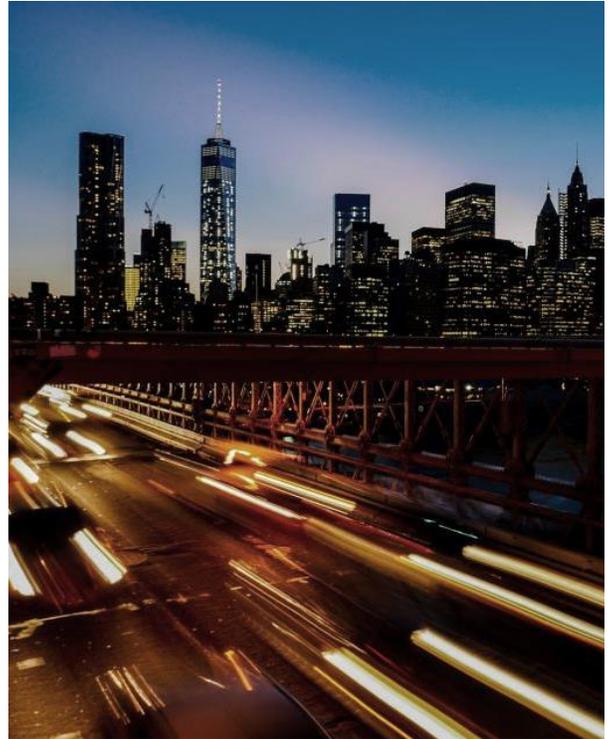
Industry forecasts are for Electric Vehicles (EV) to be more than 5-6 percent of new vehicle sales in six years and exceed 15-17 percent of all automobiles sold in ten years (2027). Close to 80 million automobiles and trucks are expected to be sold globally in 2017. That means EV sales could exceed 12 million globally in 2027, assuming the market does not grow. This will be a large segment!

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