Driverless Trucks and Transportation Insurance

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Topics

• Infrastructure challenges
• How the technology works
• Mitigating the driver shortage
• Impacting the bottom line
• WIFM: transportation insurance
• Summary
Infrastructure Challenges
2017 Infrastructure Report Card

Source: American Society of Civil Engineers
The State of US Roads

- More than two out of every five miles of America’s urban interstates are congested and traffic delays cost the country $160 billion in wasted time and fuel.
- One out of every five miles of highway pavement is in poor condition and our roads have a significant and increasing backlog of rehabilitation needs.
- After years of decline, traffic fatalities increased by 7% from 2014 to 2015, with 35,092 people dying on America’s roads.

Source: US Debt Economic Analysis of Transportation and Infrastructure
Money and Political Will Needed

- With federal government debt forecasted at >$23 trillion for FY 2017 and Congress unable to commit to long-term planning or privatization of infrastructure, not much will change, most likely.
- ASCS estimates $2 trillion is necessary (all infrastructure).
- The Trump administration is eyeing a summer deadline to unveil the president’s $1 trillion infrastructure package, potentially a public-private partnership.
- Will the government invest in infrastructure, which will make it easier to adopt “driverless” vehicles?

Source: US Government Debt The Hill
Challenges

• The 3 million miles of paved roads in the United States have poor markings and uneven signage
• Pavement markings use paint with different degrees of reflectivity
• Traffic lights can be aligned vertically, horizontally or “dog-house” style in two columns

Source: Economic Analysis of Transportation and Infrastructure
Challenges

- Autonomous vehicles aren’t sophisticated enough to account for inconsistent road signs, volatile weather and unpredictable pedestrians and drivers
- Automakers have to develop more sophisticated (costly) sensors and maps to compensate

Source: Where's the lane? Self-driving cars confused by shabby U.S. roadways
The Technology
Only a Matter of Time

- Trucks of this nature will be in a decade-long testing phase, racking up over a million miles before being deemed fit for adoption.
- Utilizes radar sensors, cameras, and LiDAR (light in the form of a pulsed laser to measure ranges to the Earth) to detect objects and lane markings around the truck in order to take over steering, breaking, and acceleration functions.
- A driver is required in certain situations, such as when entering and exiting the highway and when not on the interstate.
- **Ultimately the driver will be replaced entirely.**

Source: CNN Money
How It Works

• Adaptive cruise control keeps the truck the right distance from the vehicle in front of it
• Can come to a complete stop if necessary
• **Uses a GPS-based autopilot system accurate to up to 5 centimeters**
• Can operate autonomously in urban environment on a preprogrammed course that had been “mapped” by other autonomous vehicles
• Dedicated short range communications radio antennas allow the vehicles to communicate with each other, as in a platoon situation

Source: [Truck News](https://www.trucknews.com)
New Trucks Not Needed

- **Otto**, a new company founded by former Google employees (and recently acquired by Uber), doesn’t build its own self-driving trucks, but instead makes hardware kits that can be installed in those that are already on the road
- Companies can upgrade their current rigs vs. buying new trucks
- The $30,000 kit can make any truck built since 2013 autonomous
- ROI should come quickly on a $150,000 rig that drives hundreds of miles daily

Source: [Wired](https://www.wired.com)
All Innovation Starts with Beer

• First commercial delivery using Otto’s technology (a start-up Uber acquired) was 50,000 cans of Budweiser over 120 miles in late 2016

• Unlike other self-driving systems on the market, such as Tesla's autopilot, Otto's tech lets drivers get out from behind the wheel altogether (at least while on the highway)

Source: Washington Post
Platooning

• One or more trucks follow the lead truck in a very tight formation at highway speeds
• **Can ease congested roads**
• Uses vehicle-to-vehicle communications, adaptive cruise control, collision avoidance systems, radar and GPS data.
• The trucks constantly maintain a communication link
• 5-10% reduction in fuel cost

Source: [Automotive World](https://www.automotiveworld.com)
Mitigating The Driver Shortage
Driver Shortage

• Almost 70% of US freight is moved by motor truck
• **Freight tonnage will increase 24% by 2022**
• But there are not enough people to do the work
• The shortage of truck drivers has grown to nearly 48,000
• This could expand further due to industry growth and a retiring workforce
• The shortage may balloon to almost 240,000 by 2023

Source: [American Trucking Association](https://www.trucking.org)
Jobs to Fill, but Too Few Workers

- Over the next decade, the trucking industry will need to hire 890,000 new drivers, or an average of 89,000 per year
- 45% of the demand comes from the need to replace retiring drivers
- Industry growth is the second leading driver of new hiring, accounting for 33% of the need
- Fleets consistently report receiving applications for open positions, but 88% of the candidates do not meet hiring criteria
- Not having to be glued to the steering wheel for an entire trip might attract more people to the profession, helping to bridge the gap for now....

Source: American Trucking Association
Impacting The Bottom Line
Decreasing Accidents

- About 90% of accidents are caused by driver error
- In 2012, the United States reported 330,000 accidents involving trucks, killing nearly 4,000 people
- Machines don’t get tired, distracted, drink alcohol or take drugs
- Keeping tired drivers off the road will reduce costs by ~$1 billion, due to reduced paperwork and time-savings

Source: National Highway Traffic Safety Administration; Cerasis
Cutting Costs

• Robot trucks won’t look for another job
• They also do not need salaries, which will increase because of supply and demand in the trucking industry
• They also do not need health insurance, a major expense for most companies
• Turnover rate* for truck drivers is >4x worse than the average for other industries
• This drives up expenses for carriers and, eventually, shippers

Source: ATBS
Cutting Costs

• The vehicles will be more fuel efficient, a significant part of a trucker’s operating cost
• The main cost will be upkeep of the machinery
• Self-driving trucks will not need to stop for a rest break
• Routes will take less time to complete and costs will come down for the consumer

Source: ATBS
WIFM: Transportation Insurance
Accidents

- Damage to cargo due to accidents is a leading cause of loss, often due to driver fatigue
- The DOT limited the number of hours a driver can operate before taking a break, but this is routinely violated
- The quality of drivers as evidenced by government safety statistics and MVRs is a major part of the decision making and pricing point in underwriting
- **Remove human drivers = lower premium**
Theft Claims

• Theft claims are another leading cause of loss
• The average theft claim is ~$230,000
• Claims of this sort can be quite high for certain commodities – several million dollars - such as electronics and pharmaceuticals

Source: Business Insurance
Theft Claims

- Often times underwriters will buy reinsurance for high value shipments to protect their loss ratio, the cost of which is passed on to the consumer.
- Underwriters review the expiring carrier’s loss experience to help price this cause of loss, as well as to set terms and conditions, e.g., theft limitation.
- Many thefts are actually committed by the driver in collusion with a non-employee.
Theft Claims

• Trucking companies will not let their drivers stop in “red zones” - areas where theft is highly likely to occur
• They monitor these driving routes using GPS
• An alert occurs if the driver operates outside of the expected path or takes a break in these high risk areas
• The only reason a non-human driver would need to stop is to refuel
• **Remove the human driver and you will have fewer theft claims, and a lower premium**
Cyber and Terrorism

- DOT, National Highway Traffic and Safety Administration, and the FBI have released a warning to drivers about the threat of over-the-internet attacks on cars and trucks
- Charlie Miller and Chris Valasek hacked a Jeep in 2013, causing it to go out of control
- Chrysler issued a recall for 1.4m vehicles and mailed USB drives with software updates to affected drivers

Source: Forbes
Cyber and Terrorism

- Common dongle (2-inch-square gadget designed to be plugged into dashboards and used by insurance firms and trucking fleets to monitor vehicles’ location, speed and efficiency) can be hacked to disable car brakes, as was proven on a Corvette
- Argus Cyber Security was able to take control of a vehicle via Bluetooth and shut the engine off
- Terrorist attack scrambling the network is a real risk
- **Hacking an 18 wheeler and causing a major accident could quickly put the adoption of the technology on hold**

Source: Wired; Computerworld
Summary
Less Premium Per Unit

- If driverless vehicles become the norm, accidents and theft claims should decrease
- This will lead to lower experience (loss) rating, and a lower charge per unit
- Carriers that provide inland marine coverage for the transportation industry will see their rates go down, but....
More Exposure Units

- “Driverless” vehicles will solve the driver shortage
- **Premium volume will increase with more trucks on the road**
- The driver might not disappear altogether, because someone is needed to get the goods in and out of the truck, although this could be automatized as well
Not Everyone Wins

- There are 8.7 million trucking related jobs: 3.5 million drivers and 5.2 million non-drivers
- Their income creates plenty of other jobs in other industries
- Significant infrastructure underpins these jobs
- Huge parts of the economy could be affected by the replacement of human drivers with machines, leading the increased urban and rural decay

Source: American Trucking Association
Get Ready

- Underwriting practices will change
- **Over time, the quality of drivers will not be the focus, but rather the quality of the technology installed, maintenance procedures, upgrades, cyber controls, etc**
- Analytics (based on truck performance) will be more readily available and shared with underwriters to help segment risk and pricing

*How are you going to adapt?*