This is a reasonably good article; however, the title errs on the side of stating the obvious: no one has proposed that we move without caution. This is a serious business dealing with serious technology. Points of caution pointed out by Knight should/must be addressed, and they are addressable. The subtitle suggesting that the degradation of our driving abilities should be worth mentioning in this leading position is perplexing. If riding shotgun degrades our ability to drive, its liberation is surely worth it. To date, every car trip has enslaved someone to do the work of driving, which in too many cases hasn’t been done well enough. The objective of the objective of the automation is to enhance mobility by beginning to break the shackles.

When one gets to the article, it is a pretty good as are some of the comments. I do wish to add a few of my own:

I do want to comment on a few things:

1. One should pay attention to cognitive psychology and Norman. The earlier one does that, the better abd faster we’ll get there.
2. The sentence; "No system can yet match a human driver’s ability to respond to the unexpected, and sudden failure could be catastrophic at high speed." needs to be challenged...
   a) There is no such thing a sudden failure,
   b) The claim made needs to be supported by data that reports "human driver’s ability to respond" to whatever one would like to define as unexpected, sudden and high speed. I suspect that those data would not be pretty and the results of human intervention may not be better than "cooling it and doing nothing".
3. There seems to be a presupposition that we all like driving all the time and are good at it. I challenge that. It may not even be true that many of us like driving some of the time and are reasonably good at it. More truth may exist in: we love to drive in few instances, but are just trying to get someplace as fast-as-reasonably-safe, would much prefer doing something else, yet need to feel that we are in control. If I am right, then our approach needs to be substantially different. First, self driving and complete autonomy is NOT the goal because we want those "few instances". Second, the user interface and the hand-off back and forth have to be "Normanesque". And finally, the automated systems have to be vigilant all the time and do their thing in response to the unexpected and sudden, else do nothing. I am confident that we can write the code that allows the system to respond very well and certainly better than you would (of course I would respond better ;-) ). This is the way my anti-lock brakes operate. The name says it all! This is the way my automated driver should operate when I choose to let it drive, anti-collision (and get me there fast). And if it becomes tired or finds that it is entering into a realm that it may have difficulty, then it should slow down and even "pull over" and ask me if I want to take over, much as I would do if I got tiered and had someone riding shotgun with me. I certainly wouldn’t all of a sudden yell, "hurry up take over, I'm clueless"! Clearly, in the beginning, the automated system may often find itself in a bad situation and cause/ask us to take over. This was the initial experience with (dumb) cruise control and now with (intelligent) cruise control. This will be the case with automatic lane keeping, but as we improve the systems, they must allow us to relax as (dumb) cruise control has
done that on long boring uncongested stretches) and do something else if we so wish (hopefully lane keeping will deliver that freedom for at least a short period of time). If not, we won’t have to worry about it because it won’t have a compelling business case and it won’t make it to the marketplace.

4. The parallel with airline pilots doesn’t work, because the pilots run the industry and it’s all about job security. We might not be ready to ask: “Why is there a pilot?”; can’t we ask: “Why are there 2 pilots when there is also have an autopilot?”

Enough for now, it is a good article.

Alain

Michigan Governor Promoting Self Driving Cars I hope that Governor Christie will take the lead on the East Coast and make Smart Driving Technology the centerpiece of a strategy to make New Jersey roadways the safest in the World.

The Economist Look, no hands One day every car may come with an invisible chauffeur

Apr 20th 2013 Not much new and unfortunately doesn’t praise safety enhancements that will be captured even before we get to “one day...” if we focus, welcome make available in the showrooms affordable Smart Driving Technology.

Summaries:

TransAction

April 18, Atlantic City, NJ I spoke on “Smart Driving Cars: Where Are We Going? Why Are We Going? Where Are We Now? How Might We Get There? Where Might We End Up? ” Presentation was similar to that which I gave at the ITE meeting except it included an expanded section on the rudimentary business case for Smart Driving Cars as well as some of the ride-sharing and fleet size estimates for a New Jersey area-wide autonomousTaxi System findings in Chris Brownell’s senior thesis.

Calendar of Upcoming Events: The Premier Road Vehicle Automation Event in North America. Transportation Research Board’s premier multidisciplinary research and policy conference focused on Road vehicle Automation will take place at Stanford University on July 16-19, 2013. If you are actively involved in road vehicle automation and would like to actively contribute to the success of this conference by becoming a patron or sponsoring one of the meals, please contact me at alaink@princeton.edu.
From the Public Sector: Request for Information (RfI) from US DoT on Surface Transportation System Automation. Please provide your input to many very deep research questions. Deadline: Tue. April 23 @ noon. My response will be at http://orfe.princeton.edu/~alaink/SmartDrivingCars/Kornhauser_%20Response2AutomationRfI.pdf

Smart Driving Cars
Monday, April 14, 2013

The Business Case for SmartDrivingCars: For the consumer, SmartDrivingCars have three main values: increased safety, comfort and convenience. Of these safety is most easily quantified because damages are largely adjudicated in monetary terms. AAA estimates that traffic fatalities and injuries amounted to $256B in 2011, or a cost of about $1,328 in '05 dollars for each licensed driver. Of this amount approximately 50% ($664) is paid by private insurance, the pass-through portion of insurance premiums. Individual crash victims absorb 26% ($340) of the cost (basically the deductible of what the insured has to absorb if involved in an accident), other 3rd parties absorb 14% ($185), the Federal treasury absorbs 6% ($80) and local municipalities 4% ($50). Google’s simulation of the operation of its self-driving car on the range of real crash scenarios resulted in a forecast of 81% fewer fatalities and 65% fewer injuries. This substantial reduction in car crashes would save in the US $183 billion annually. Moreover, these safety improvements would be enjoyed proportionally by each owner/user of a Google car. Thus, the insurer of the average licensed driver switching to a “Google car” could expect to reduce its pass-through liabilities by an average of $475 per year. Since these are simply pass-though dollars, one could expect that an insurance price-leader might readily offer discounts of up to, say, $450, keeping the expected remaining $25 for its “generosity”. The Google car user would also forgo $247 in expected “deductible self-insured” obligations.

The $450 insurance discount could readily finance, if not the expensive Google “lidars”, the lower cost radars and cameras contemplated by the auto industry for its initial wave of automated lane keeping and “always-on” collision monitoring and avoidance systems. For example, the Mercedes “jam-assist” system is expected to be available on 2014 models as a $3,000 “driver assistance safety option”. While jam-assist doesn’t have all of the features of a Google car, it may be able to capture as much as two-thirds of the safety benefits through the collisions that jam-assist can be expected to avoid during the car’s lifetime. If so proven, then the $300 discount that Flo, or the Gecko, or Good Hands or the General or some other insurer can readily offer would essentially finance this $3,000 safety feature. In fact Flo should escort you to the Mercedes dealer and pay for the option if you agree to buy a Mercedes and continue your current policy payments. (Remember, in giving Mercedes $300 per year over say 12 years, she is also keeping that $25 “generosity” for her effort, so she is happy.) In addition to substantially reducing the probability that this car is going to kill you, what’s in it for you? Well, how about the two-thirds of the $247 self-insurance expected obligation that you would avoid each year. More importantly you get the anxiety-relief that flows from having driving assistance while traveling in some of the most tedious, boring and unpleasant roadway conditions. Finally, society wins because we can’t really place a value on the injuries and fatalities that will be prevented. They are priceless!

Going all the way with Google Cars (or even just two thirds of the way with “jam-assist”) would mean for New Jersey an annual avoidance of 500 (340) fatalities and 28,000 (19,000) injuries “valued” at $3.55 ($2.38) Billion per year.

We MUST make this happen. Everybody wins.
European Update: **Workshop: Automation in Road Transport** (contains links to participants & presentations)

As background if you haven’t read it: from June 29, 2011: **Definition of necessary vehicle and infrastructure systems for Automated Driving** Final report SMART 2010/0064

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**Smart Driving Cars**

**Monday, March 11, 2013**

**Smart Driving Cars**

**Monday, March 4, 2013**

**Smart Driving Cars**

**Monday, March 18, 2013**

**Smart Driving Cars**

**Monday, March 25, 2013**

**Smart Driving Cars**

**Monday, March 31, 2013**

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**European Update:** **Workshop: Automation in Road Transport** (contains links to participants & presentations)

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**Automated Steering Avoidance** of imminent collision on **Frozen Lake done Feb 23, 2013**. Views outside the vehicle of automated collision avoidance maneuvers involving only steering (no differential wheel braking. Views from outside the vehicles:

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**Smart Driving Cars**

**Monday, March 11, 2013**

**Best videos from Workshop: Automation in Road Transport** (contains links to participants & presentations)

Automated Steering Avoidance of imminent collision on **Frozen Lake done Feb 23, 2013**. Views outside the vehicle of automated collision avoidance maneuvers involving only steering (no differential wheel braking. Views from outside the vehicles:

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**Continental and BMW Group Working Together to Develop Freeway-Grade Highly Automated Driving**

**Continental Press Release**

**BMW Press Release**

This is BIG, not only because they have “an agreement to jointly develop an electronic co-pilot for this purpose”, but because...

- It aligns a component supplier with a manufacturer. Where does this leave Daimler and VW/Audi? To join up with Bosch?? What about Delphi? Join back with GM on this one?? Where does this leave the other manufacturers; will they align? The competitive race to attract consumers to the showroom has really heated up.
• They've realized that safety is now clothed in comfort & convenience. Together, they make a powerful message to the car buying public. This technology will draw people into the showrooms. The wake-up call was delivered by the emergent competitor, Google, rather than government edicts or rule-makings. “… [I]n capitalist reality…, it is not [price] competition which counts but the competition from the new commodity, the new technology…- competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives.” Joseph A Shumpeter (1883-1950)

Dear Alain,

I am writing to express my strong support for your Smart Driving Cars initiative. I believe that this technology is a game-changer in the automotive industry and will significantly improve road safety and convenience for all drivers.

Sincerely,

[Signature]

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