NEW TECHNOLOGY—OLD LAW: SOME LEGAL CHALLENGES OF SELF-DRIVING VEHICLES

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WHAT'S IN A NAME?

Autonomous, automated, self-driving or driverless?

"Autonomous lawnmowers were a bad idea. I see that now."

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Earlier Autonomous Vehicle

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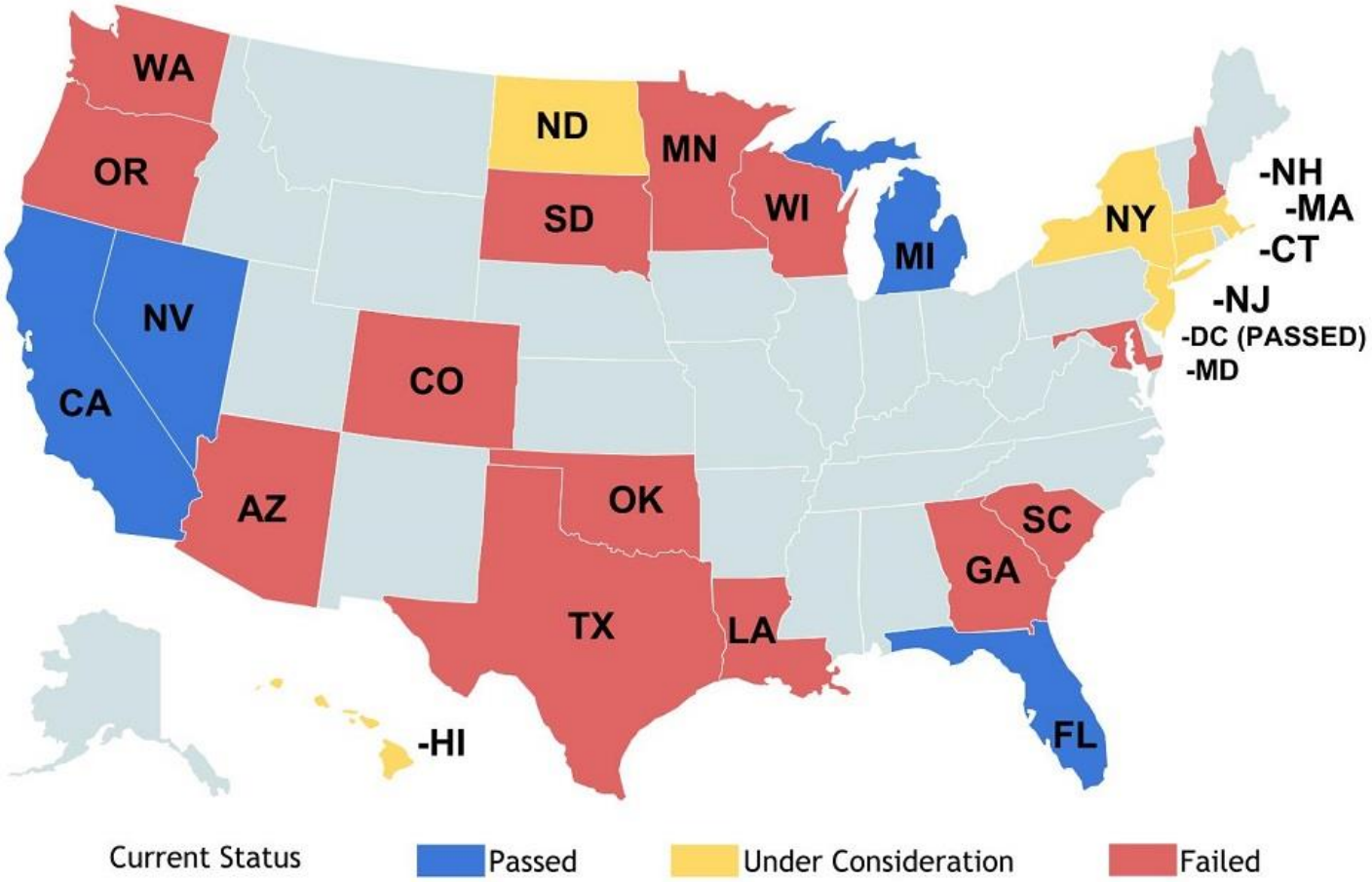
Puck Magazine, April 16, 1902

(The caption reads, "AS THE LAW STANDS: Owner (*To Chauffeur*). — Don't stop! It only costs about ten dollars apiece to run them down. I must break the record even if it costs a hundred!)

Advertisement from 1957 Independent Electric Light and Power Companies ad. "ELECTRICITY MAY BE THE DRIVER. One day your car may speed along an electric super-highway, its speed and steering automatically controlled by electronic devices embedded in the road. Highways will be made safe—by electricity! No traffic jams . . .no collisions. . .no driver fatigue."

Web site tracking legislative and administrative developments for autonomous vehicles:
http://cyberlaw.stanford.edu/wiki/index.php/Automated_Driving:_Legislative_and_Regulatory_Action#State_Bills



Some Advantages:

- Accidents—90^{+}% or more caused by human error.
- 5.3 million crashes in 2011
- Leading cause of Death, ages 3-34.
- Over 32,000 U.S. deaths. In U.S., over 1 mil. Worldwide per y. Over 10 y., more that the population of St. Lewis. (Downward trend—50 per billion vehicle miles traveled (VMT) in 1960 to 11.3 per billion VMT in 2012.
- U.S. auto deaths over 2x - 3x worldwide Ebola deaths in 2014. http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html
- Cars and light trucks—21,000 deaths. Motorcycles--4,600 deaths. Pedestrians--4,400 deaths.
- Over two million emergency room visits/year.
- NHTSA estimates U.S. economic and social costs of $871 Billion/year (not including cost of car ownership).

Human causes of accidents

- DRIVER INATTENTION 22.7%
- VEHICLE SPEED 18.7%
- ALCOHOL IMPAIRMENT 18.2%
- PERCEPTUAL ERRORS (e.g. looked, but didn't see) 15.1%
- DECISION ERRORS (e.g. turned with obstructed view) 10.1%
- INCAPACITATION (e.g. fell asleep) 6.4%

U.S. Dept. of Transportation report, 2001

Alcohol Related Traffic Deaths

--39 percent caused by alcohol impairment

--49 percent of pedestrians killed were under the influence

--38 percent of cyclist killed were under the influence

RAND Report, p. 16

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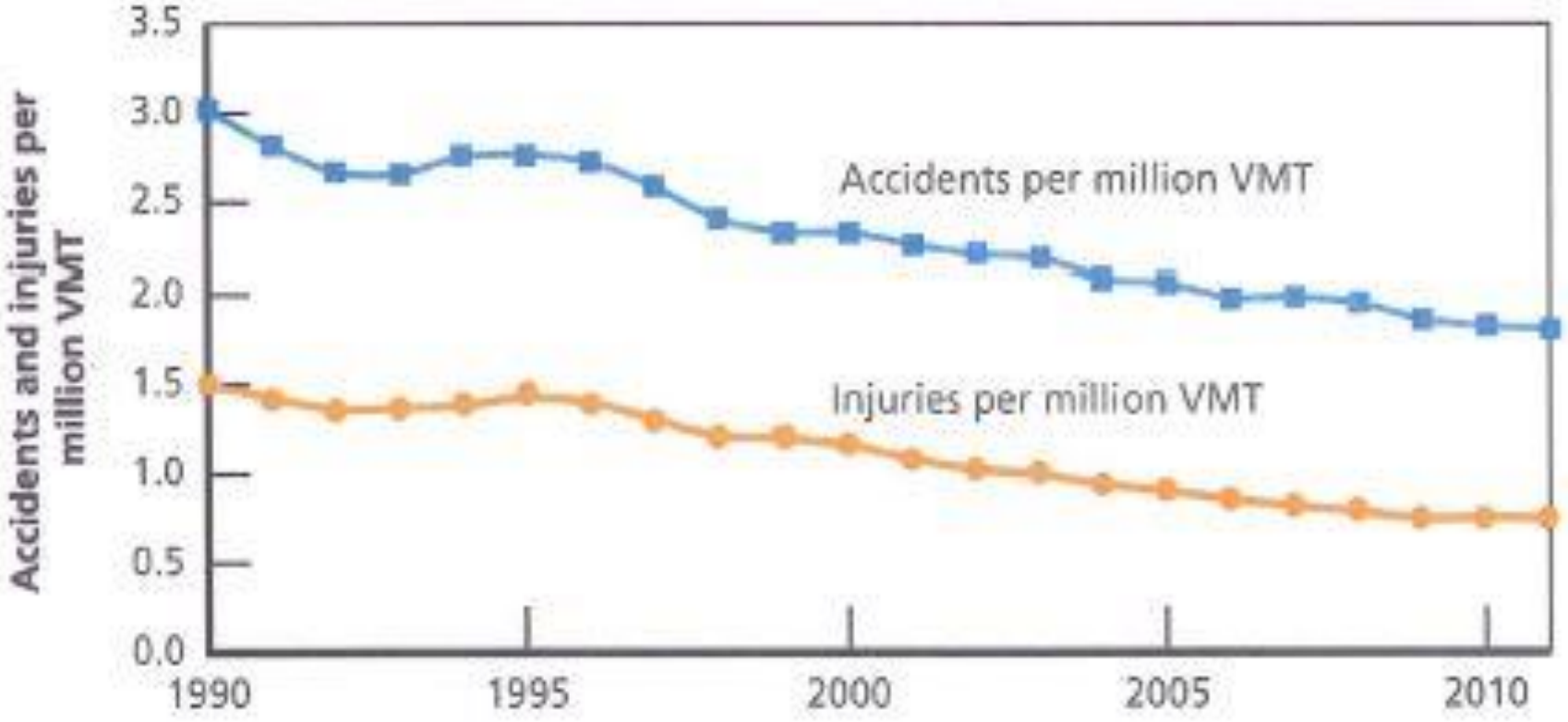
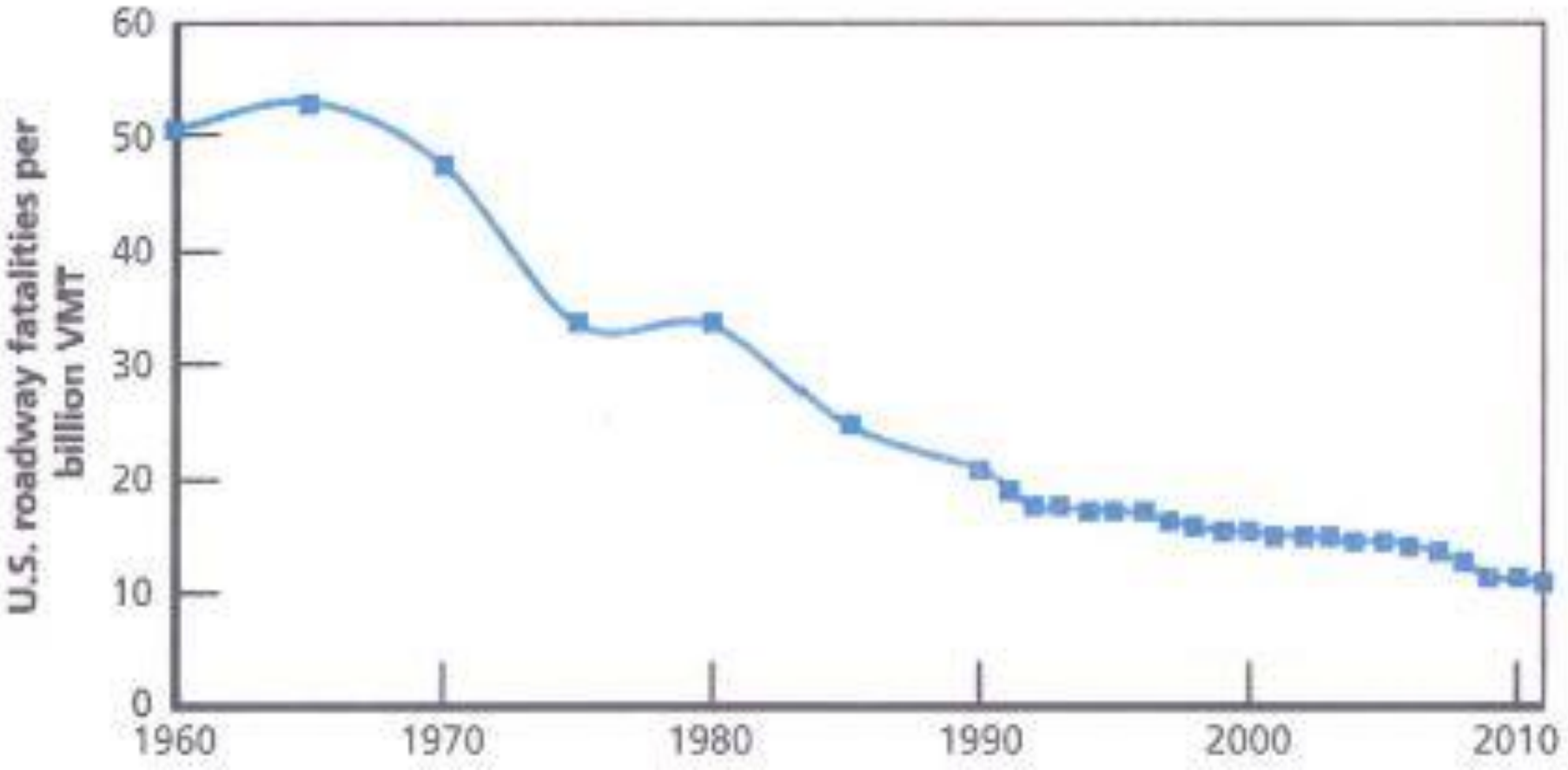
Figure 2.2
U.S. Roadway Accidents and Injuries per Million Vehicle Miles Traveled



NOTE: Data from the Bureau of Transportation Statistics (BTS, 2013) includes all highway transportation modes: passenger car, light truck, motorcycle, large truck, and bus. Crashes involving two or more motor vehicles are counted as one "crash" by the U.S. DOT, so total crashes shown here are fewer than the sum of individual vehicles involved. Injuries include vehicle occupants for all highway modes as well as pedestrians and cyclists. RAND report, 2014, p. 13

Figure 2.3

U.S. Roadway Fatalities per Billion Vehicle Miles Traveled



NOTE: Data from BTS (2013) includes all highway transportation modes: passenger car, light truck, motorcycle, large truck, and bus. Fatalities include vehicle occupants for all highway modes, as well as pedestrians and cyclists. **RAND report, 2014, p. 14**

Estimated Safety Benefits

- Analysis based on NHTSA DOT HS 810 767 Pre-Crash Scenario Typology for Crash Avoidance Research
- For Highway relevant scenarios
  - –71% fewer crashes
  - –65% fewer injuries
  - –81% fewer fatalities

Private insurer liability per driver could drop from approx. $664/driver to $189/driver—a savings of $475/driver/year.

Source--Princeton Autonomous Vehicle Engineering (PAVE)

Some Advantages (cont'd)

- Safer—360 Degree Vision, Faster Reaction Time
- More Efficient
- Fewer Stop Signs, Traffic Lights or Traffic Jams
- They Do Not Fall Asleep, Get Intoxicated, Rubber Neck, or Experience Road Rage (Hopefully)

Some Advantages (cont'd)

- Causation Disputes and Fraud Minimized – The Event data Recorder (EDR or Black Box) Tells (Almost) All
  - Swoop and Squat
  - "Actual physical contact" for uninsured coverage
- Maximize Use of Aging Infrastructure
- Better Serve Aging Population
- Gen. Y Can Text, the More Mature Baby Boomers Can Catch Up on Jane Austen

Some Possible Collateral Impact:

- Urban Planning—No Longer Need Adjacent Parking Lots
- Commuting—More Distant Housing May Be Appealing. Vehicle Miles Traveled (VMT) may rise
- Municipal Funding—Where Did All the Parking Tickets Go?
- Auto Sales and Body Shops?

Some Issues:

- Privacy
  - –Big Data Crunching for Mapping and Other Purposes. Who Now Owns 

?
- Safety Standards. State by State? NHTSA?
- Hacking/Cybersecurity

Compensation for Injuries (Liability)

- Faulty cars with Faultless Drivers
- Standard Auto Policy
  - Liability Coverage—"legally responsible"
  - Uninsured/Underinsured—"legally entitled to recover from owner or operator"
- When, if ever, will a faultless driver be "legally responsible" for an accident or be "legally entitled" to recover from a faultless "operator" of a self-driving car?

“Uninsured” Robo Car

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“Robot depicted as uninsured motorist only. Farmers Insurance does not insure any form of robot or non-human.”

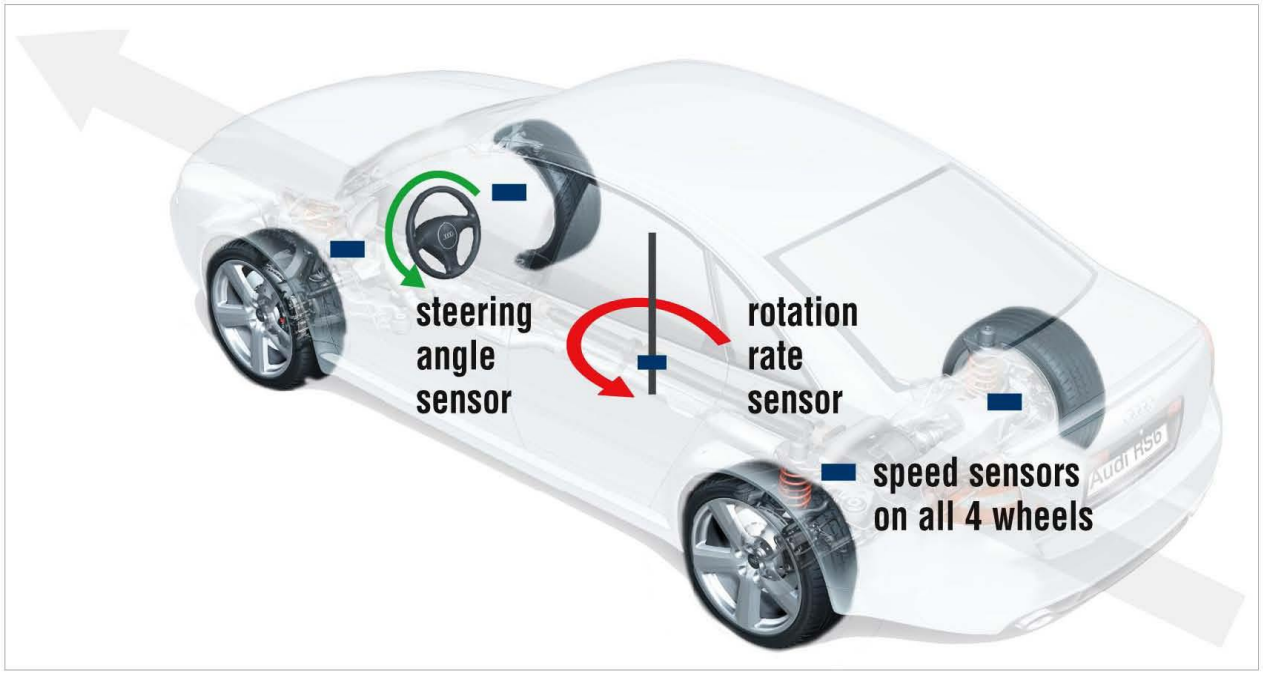
Compensation for Injuries (Liability)

- Celent—the demise of auto liability insurance premiums? "[P]roperty/casualty insurers see a major reduction in their auto insurance premiums revenue."
- Eliminate "human error" and eliminate much of premium for fault-based accidents?
- Similar decrease in comprehensive and collision losses?

Timing of introduction:

- Google—Approx. 4-5 years
- Others—2020
- Penetration? 10% saves 38 billion economic harm and 1,000 lives. 90% saves $447 billion and 21,700 lives. (2013 Eno Center for Transportation Study)
- One Example—Electronic Stability Control (ESC)

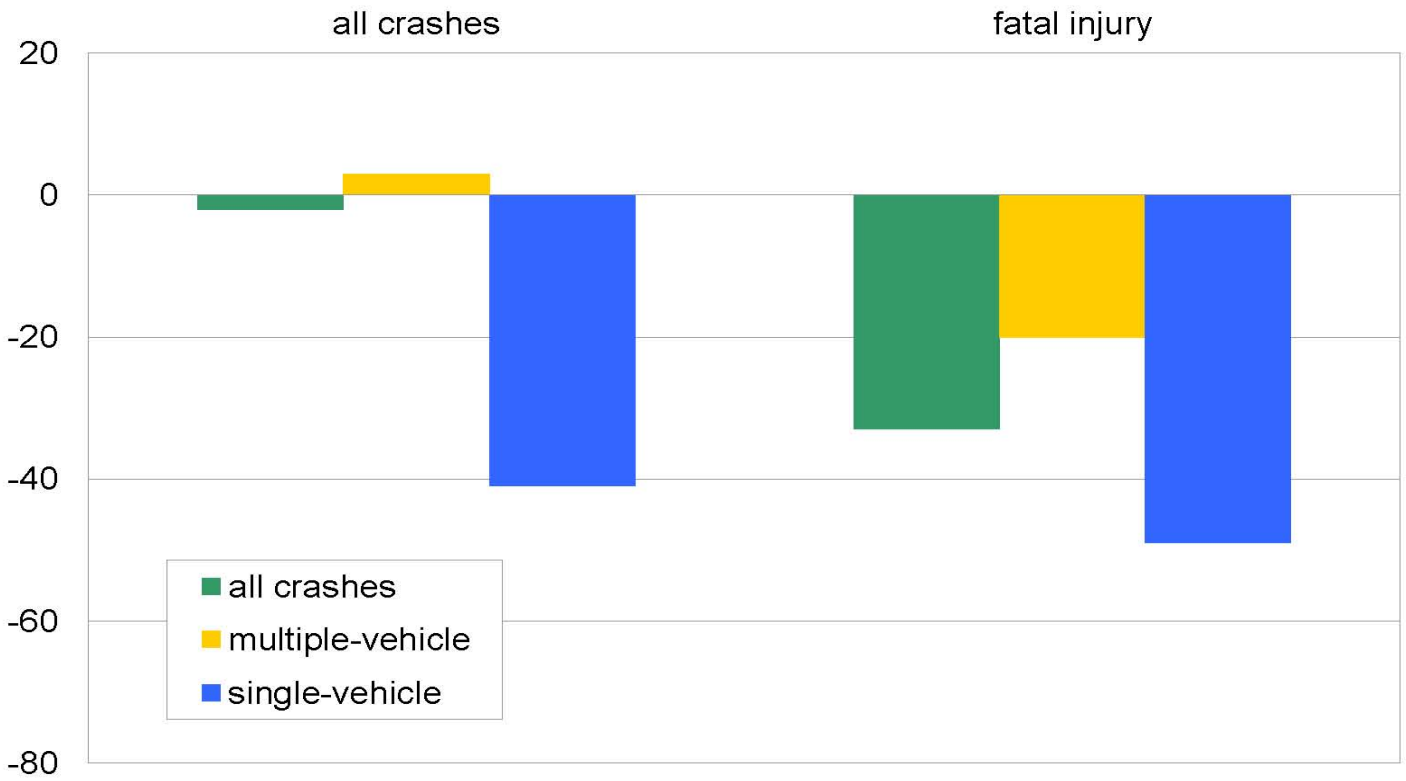
What is Electronic Stability Control (ESC)?



ESC is an extension of ABS, which has speed sensors and independent braking for each wheel. Additional sensors monitor how well a vehicle is responding to a driver's input.

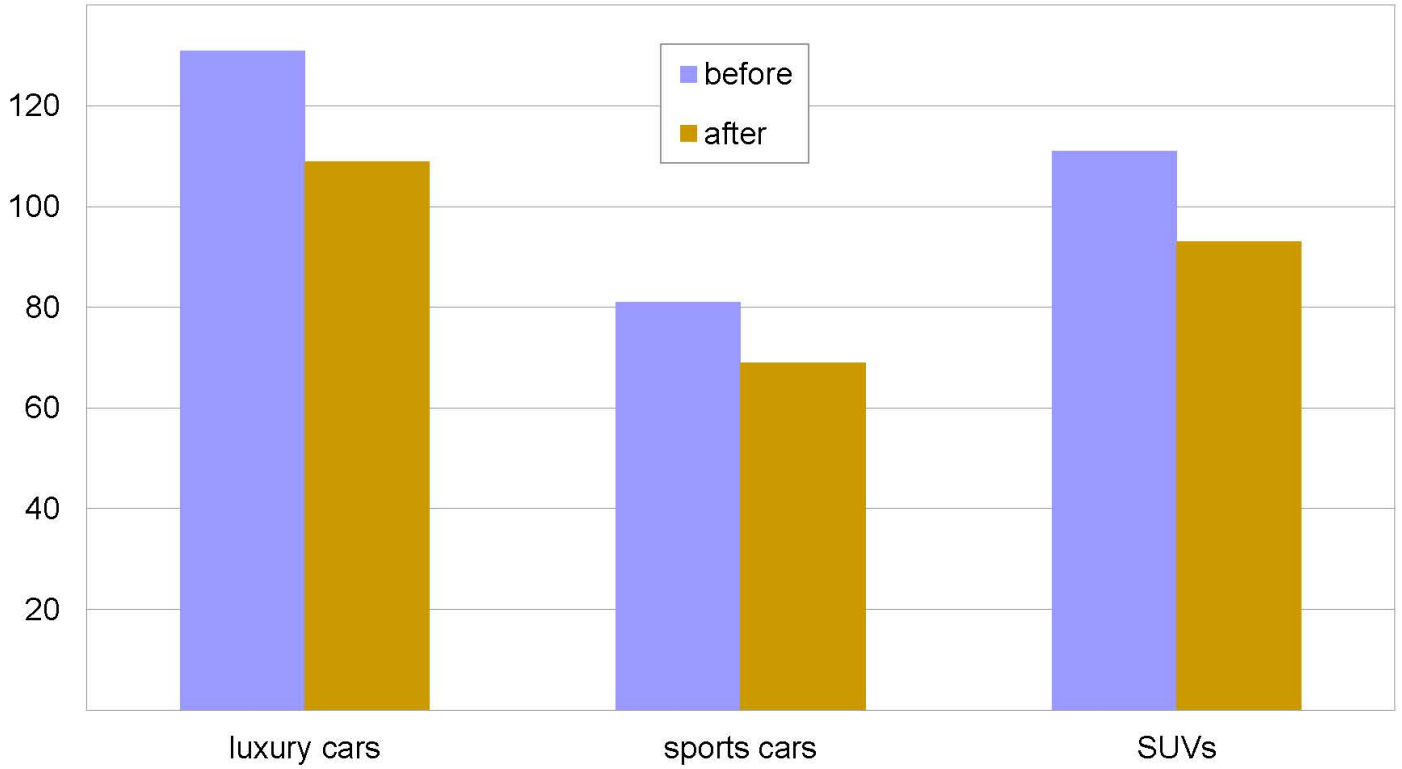
Effects on crash risk

Percent change in crash rates for vehicles with standard ESC vs. optional or no ESC, updated May 2010



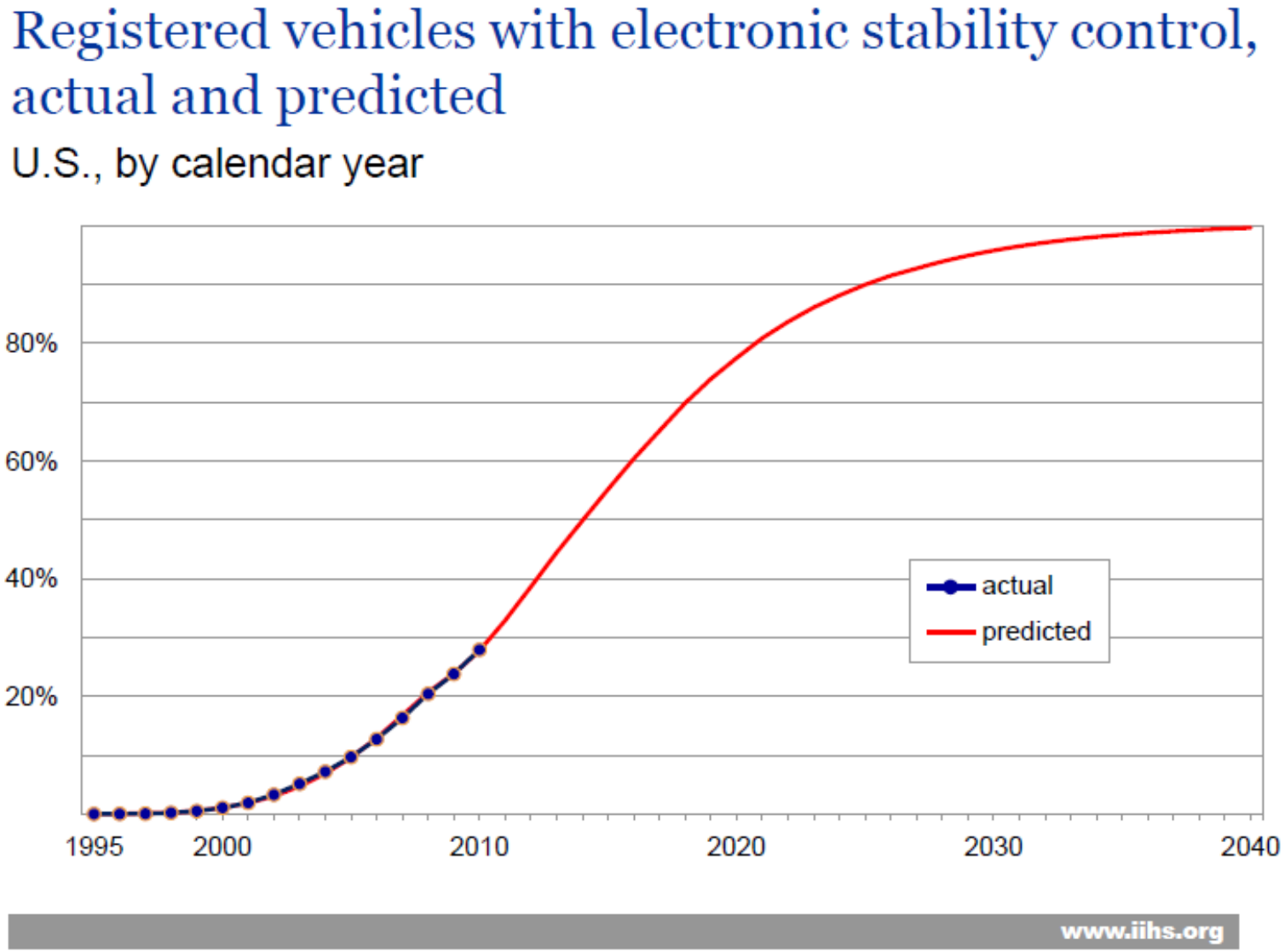
Relative overall collision losses

Before and after standard ESC, April 2006



www.iihs.org

Although mandatory in all new vehicles, it is predicted that ESC will be standard or optional on 95% of registered vehicles in 2029 and 100% by 2040.



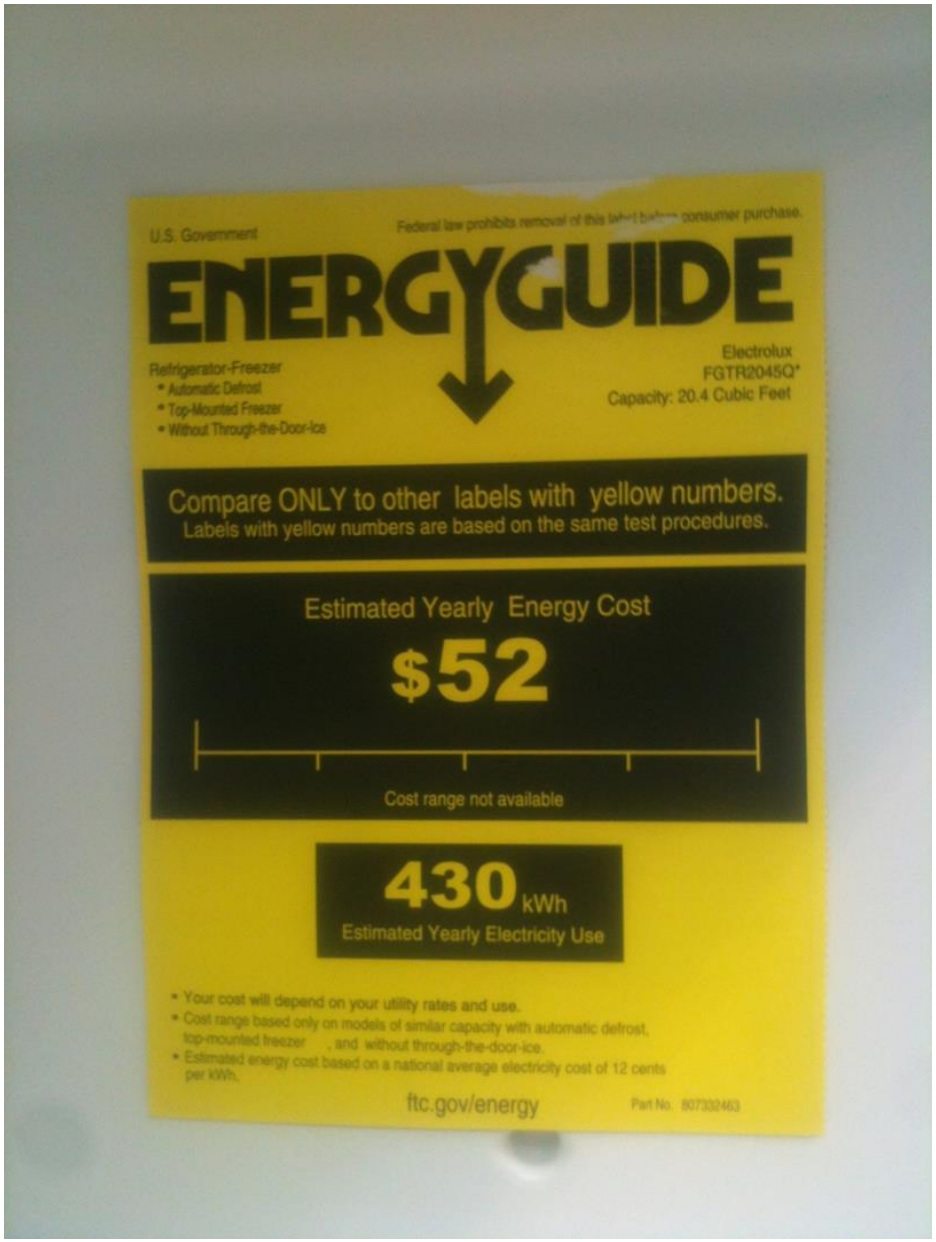
Getting Insurance Right Is Critical

--Current public attitude towards self-driving cars is tepid. Chubb and CarInsurance.com surveys suggest only about 20% of drivers are ready.

--BUT, If reduce insurance by 80%--one-third would buy one, and 9 out of 10 would "consider" buying one, even though 75% thought they could drive a car better than a computer.

--Tell Gen Y that they can TEXT, and they may fly off showroom floors (Nev. & Fla specifically allow texting).

Look in the Refrigerator for the Answer?



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Other Incentives?

- Cash to retire older cars? Air quality control districts do this now.
- Tax Credits/Deductions (Compare electric cars)
- Carpool lane?
- Higher speed limit for safer cars?
  - 55 for trucks
  - 65 for manually driven cars
  - 75 for cars in self-driving mode?

OF ELEPHANTS AND ROOMS

Assume all autos are self-driving, there are no collisions in self-driving mode, and only 1 in 100 miles is driven in manual mode.

--Reduce deaths from 33,000/year to 330?

--Repeal financial responsibility laws?

Assume frequency and severity of accidents in self-driving mode is far lower than in manual mode.

Will remaining liability remain with the operator/owner?

Will policy makers (legislatures, administrative agencies, courts) relegate injury compensation to products liability claims against manufacturers and/or supplier? Products Liability suits are less efficient. They generate about 40% in friction costs. Claims directly against drivers generate 5%-6%

What standard for "Defect?" With expanded knowledge of drivers' behavior, what standard for "Negligence?"

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Ethics--The Tunnel and the Toddler. When an Accident is Unavoidable, Who Dies?

http://robohub.org/if-a-death-by-an-autonomous-car-is-unavoidable-who-should-die-results-from-our-reader-poll/

Or:

- **1. Expand an agency analogy – the car is the "agent" of the operator/owner.**
- **2. Expand nondelegable duty – defect in the car's program, like negligently repaired brakes, is attributed in the first instance to the operator/owner. *Maloney v. Rath*, 69 Cal.2d 442 (1968).**
- **3. Operator Strictly Liable Up To Financial Responsibility Limits (e.g., $15,000/$30,000 /$5,000in CA)?**

Nevada--Nev. Admin Code sec. 484.1(a), 482.3, 482a(4)(2) provides that autonomous vehicles "shall comply with all statutes and regulation. The "**autonomous technology** shall be granted all of the rights and shall be subject to all of the duties applicable to the driver . . . ." The person who causes the autonomous vehicle to engage **is "deemed the operator" and "for the purposes of enforcing the traffic laws and other laws applicable to drivers . . . shall be deemed the driver."** Does this language impose a nondelegable duty in tort?

See: http://www.leg.state.nv.us/register/2011Register/R084-11Apdf

Colorado--Compare Colorado Bill (SB 13-016--indefinitely postponed) "[t]he **driver is responsible for any damage** caused by a motor vehicle being driven by means of a guidance system to the same degree as if the driver were manually driving the vehicle."

California

Piecemeal, state-by-state approach. E.g., assuming a continuing role for private automobile coverage, what challenges does Proposition 103 present?

Proposition 103 applies prior approval and special rating factors to premiums for private automobile policies "as described in subdivision (a) of Section 660" of the California Insurance Code.

All states, including California, provide that rates may not be "excessive, inadequate, or unfairly discriminatory" Nevertheless, Prop. 103 and accompanying regs. mandate the top three Rating Factors in the following order of importance (abridged)

- **1. The Insured's driving safety record**
- **2. The number of miles he or she drives annually**
- **3. The number of years of driving experience the insured has had.**
- **Followed by 16 "optional" rating factors.**

See Cal. Ins. Code sec. 1861.05(a), *10 CCR sec. 2632.5*

Callifornia's Good Driver Discount:

Proposition 103: "at least 20% below the rate the insured would otherwise have been charged."

10 CCR sec. 2632.12(a): "20 percent less than the lowest rate available to a comparable driver who is not a good driver."

Lowering Rates When Technology Rapidly Improves Safety

Proposition 103 provides that "Every insurer which desires to change any rate shall file a complete rate application with the commissioner." Cal. Ins. Code sec. 1861.05(b.)

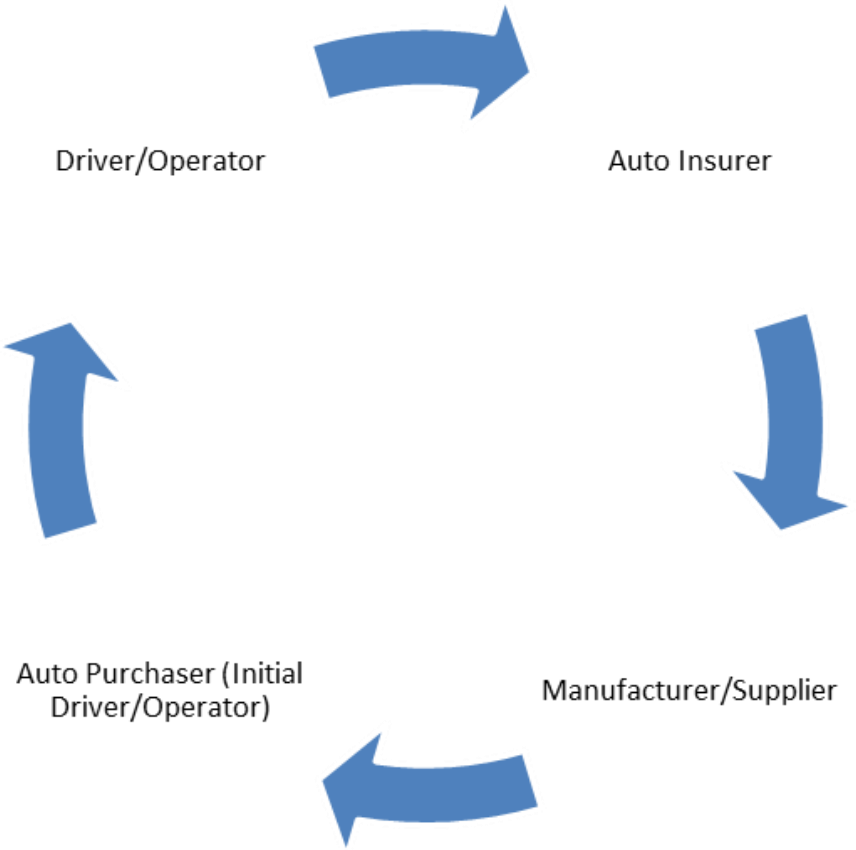
What if after every day's update, the entire fleet is safer? May rates be lowered? Does the insurer/manufacturer keep the savings?

- The Mandatory Rating Factors, the Good Driver Discount, and impediments to rate change present serious, and unnecessary issues when applied to autonomous vehicles.
- Weighting driving record and years of driving experience above the type of vehicle is arbitrary and will substantially overcharge autonomous vehicles.
- The good driver discount may overcharge “not good” drivers who move to autonomous vehicles. “Not good” public policy?
- Inability to rapidly adjust rates to reflect rapid improvement in safety may overcharge owners/operators.

The Insurance Merry-go-'Round

- 1. If only manufacturers and suppliers are responsible, Proposition 103's auto rating provisions have no application. Any savings from safety improvements flow to manufacturer's bottom line.
- 2. If automobile drivers and/or their insurers are initially responsible for accidents caused by the self-driving car, the loss can be passed back to the manufacturer and/or supplier.

- The insurance cost of the automobile, then, will pass back to the owner in the cost of the car.



- Most Rating Factors, de facto, move to the average over the pool. Some vanish.

As the significance of rating factors falls away, others, e.g. territory, will rise in weight.

- Mandatory Rating Factors:
- ~~1. The Insured' driving safety record~~
- ~~2. The number of miles he or she drives annually~~
- ~~3. The number of years of driving experience the insured has had.~~
-
- (1) Type of vehicle;
- (2) Vehicle performance capabilities, including alterations made subsequent to original manufacture;
- ~~(3) Type of use of vehicle (pleasure only, commute, business, farm, commute mileage, etc.);~~
- ~~(4) Percentage use of the vehicle by the rated driver;~~
- ~~(5) Multi-vehicle households;~~
- ~~(6) Academic standing of the rated driver;~~
- ~~(7) Completion of driver training or defensive driving courses by the rated driver;~~
- (8) Vehicle characteristics, including engine size, safety and protective devices, damageability, reparability, and theft deterrent devices;
- ~~(9) Gender of the rated driver;~~
- ~~(10) Marital status of the rated driver;~~
- ~~(11) Persistency (this is a discount for how long you have been with the insurer~~
- ~~(12) Non-smoker;~~
- ~~(13) Secondary Driver Characteristics. For drivers not assigned as a primary or secondary driver to another vehicle, this factor may be composed of a combination of the following factors: Safety Record, Years Licensed, Gender, Marital Status, Driver Training, and Academic Status;~~
- ~~(14) Multi-policies with the same, or an affiliated, company;~~
- (15) Relative claims frequency.
- (16) Relative claims severity.

Question for You

Are there other statutory or regulatory requirements that may improperly rate AVs? Please let me know.

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Some Issues on the Horizon

Will OEMs and Google become insurers? Their information for rating vehicles will be far more granular than most insurers.

Will private ownership plummet? Will AVs be deployed as a service in fleets. Uber and Google are already moving down that path.

Conclusions?

- Clarify Liability Rules?
- Amend Ins. Code Sec. 660 (2/3 vote, "in furtherance" of "purposes"?). If the software is leased or licensed and the car is guided by the manufacturer's program, can the vehicle be classified as "leased" or a "livery" conveyance?
- Modify Application of Optional Rating Factors? *Spanish Speaking Citizens' Found., Inc. v. Low*, 103 Cal. Rptr. 2d 75 (Cal Ct. App. 2000)(considerable discretion in Commissioner to integrate mandatory and optional rating factors.
- Perhaps disruptive technology requires disruptive thinking
  - Include OEM warranty covering personal injury?
  - OEM has trip data recorder information. Will OEM self-insure, stop-loss or captive? Volvo and Volvia Insurance.
  - Will manufacturer be there when it counts. Are defects in Old GM cars the responsibility of New GM?
  - Affinity group insurance as with antique or specialty cars?
  - Move to first-party insurance (e.g., no-fault or UM/UIM models, perhaps as endorsements on H.O. or Renter's policies)
  - Are Financial Responsibility laws any longer necessary?
  - When cars move like schools of fish, perhaps we move to the model of the National Childhood Vaccine Injury Act.

Some Sources, Videos, Etc.

2014 RAND report on self-driving cars:

Here's the entire report:
http://www.rand.org/pubs/research_reports/RR443-1.html

There is a 5 page summary at: http://www.rand.org/pubs/research_briefs/RB9755.html

Anthony Levandowski talk and U-tube demo of blind driver:
http://www.youtube.com/watch?v=hoyTmn3kTeI

Economist Interview, April, 2013:
http://www.economist.com/news/leaders/21576384-cars-have-already-changed-way-we-live-they-are-likely-do-so-again-clean-safe-and-it?bclid=0&bctid=2310309414001

Recent Volvo ad showing importance of texting in a self-driving car:
https://mail.google.com/mail/u/0/?shva=1#label/Insurance+Emails/144194cdbbb3cbbf

Casualty Actuarial Society self-driving car working group. Contact Jonathan Charak: jonathan.charak@zurichna.com

Peterson article on California insurance issues relating to self-driving cars:
NEW TECHNOLOGY—OLD LAW: AUTONOMOUS VEHICLES AND CALIFORNIA'S INSURANCE FRAMEWORK
http://digitalcommons.law.scu.edu/facpubs/337/

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Some Sources, Videos, Etc. Cont'd

Brookings Institute—Products Liability and Driverless Cars: Issues and Guiding Principles for Legislation

http://www.brookings.edu/research/papers/2014/04/products-liability-driverless-cars-villasenor

Google Video Explaining How The Google Car Works

http://forums.xilinx.com/t5/Xcell-Daily-Blog/Must-See-Video-Google-s-self-driving-car-keynote-at-last-month-s/ba-p/473330?goback=.gmr_4731574.gde_4731574_member_5885412158535147523

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A Thoughtful, But Critical Essay On the Current Approach to Certifying Self-Driving Vehicles in California and Elsewhere

http://www.huffingtonpost.com/jonathan-handel/how-do-we-know-driverless_b_5549658.html

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