Self-Driving Cars

PCAST Briefing, Washington DC, May 2012
Toyota Prius Saved Alex
We make a big difference
What would cars be like today if the computer would have been invented before the car?

Benz Patent-Motorwagen 1885

Apple II 1977
Why Google?

- solutions that have huge impact on humanity
- challenging technical problems
Driving as the distraction

"For some, driving is the distraction"
- Allan Taub, ex-VP GM
People already living in their cars

Trumpet practice?
It’s all about safety

- >90% of collision caused by human error
- 32,788 fatalities per year in 2010
- ~1,500,000 per year world wide
Outside of test car
What does the car “see”
What does the car "see"
Suburban Streets w/ Joggers
Dogfooding

My Commute

• 14 minutes driving
• 45 minutes “autodriving”
• 8 control transfers
Time to Collision

TTC = -(Instantaneous Range) / (Instantaneous RangeRate)

If both vehicles continued traveling at the same constant speeds they were traveling when TTC is measured, the collision would occur after a time of TTC.
Time to Collision (cdf) (seconds)

Data is filtered to events where TTC <= 15s

100 car naturalistic study included TTC <= 4s for “near-miss” event
Time to Collision (<=7.5 seconds)
Where are we at – Testing
Danger is the failure of our imagination.
Our mission is:

Improve people’s lives by transforming mobility