




Autonomous Vehicles: What Are the Policy Implications?

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Autonomous vehicle technology is developing quickly

A white Google self-driving car is shown from a side profile, parked in a grassy field. The car has a prominent white sensor dome on its roof. The driver's side window is visible, showing a person wearing sunglasses. The background consists of rolling green hills under a clear sky.

Google X test program has logged 500,000+ crash free miles

Lessons from the past temper optimism

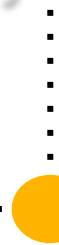
Airbags first patented



1953



Airbags first introduced in luxury models



1970s



Airbags required after 1999



1991



Analysis for Policymakers

- What are the **advantages and disadvantages** of automated vehicle technology?
- What **obstacles** prevent us from realizing the benefits?
- What can policy makers **do** about it?

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Autonomous vehicles have the potential to save lives...



...to improve mobility...



...reduce traffic congestion and related costs...



**...reduce fuel consumption
and environmental impact...**



...and improve land use



But the same technology could bring about societal disadvantages as well



Congestion could increase if people drive more



Public transit ridership might decrease



Some could experience economic disruption



Existing “crash economy”

Drivers

City parking revenue



Overall societal benefits of autonomous vehicle technology exceed costs

Reduction in crashes could save billions of dollars and thousands of lives

Existing cost of congestion and traffic costs also significant

No category of plausible disadvantages comes close

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Many benefits of the technology won't go to the purchaser

		Would the buyer benefit?	
Mobility	→	Yes] Buyer only gets some benefits
Cost of congestion	→	Yes	
Safety	→	Partly	
Congestion	→	No	
Energy consumption/ emissions	→	No	
Land use	→	No	

Automaker liability likely to increase

A close-up, front-facing view of a silver car. The car's headlights, grille, and bumper are visible. A white rectangular placeholder covers the license plate area. The car is parked on a paved surface, and a green curb is visible in the lower right corner.

Crashes will be viewed as fault of car and manufacturer, not driver

Existing products liability law does not consider long-term benefits

Additional factors may affect market viability



Driver overconfidence/undervalue
of safety

Additional factors may affect market viability



Driver overconfidence/undervalue of safety

Automaker perception that safety does not sell

Additional factors may affect market viability



Driver overconfidence/undervalue of safety



Automaker perception that safety does not sell



Early stages will require trained, alert drivers

These factors together may result in market failure or slow adoption



Societal benefits may exceed costs but no one may sell or buy cars



If adoption is slow, thousands may die unnecessarily

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A photograph showing the interior of a car from the driver's perspective. A man is sitting in the driver's seat, smiling and looking towards the camera. The steering wheel is on the left, and the dashboard and center console are visible. The car has a sunroof and a rearview mirror.

Ideally, individual consumer benefits and costs should equal societal benefits and costs

Consider subsidies and user fees to help equalize public and private benefits

Further research is needed to better quantify the likely costs and benefits and to whom they will accrue

Liability law changes *may* help


Vs.

Clarify liability standards for imperfect technologies

Federal preemption of state tort remedies?

Irrebuttable presumption of driver responsibility?

Collaborate -- don't over-regulate



States have different regulations

Technological concepts differ widely

Premature regulation can halt evolution

Assess whether long-term policies and investments hinge on “Business as Usual”

- Do our current long term investments and plans hinge on “business as usual” models of land use, vehicle ownership, transit ridership should continue?
- What aspects of the plans/investments could be derailed if some of the changes from AVs occur?
- How would we know? What is a plan for staying abreast of these changes?
- Can we identify changes we might make to evolve along with the technology?

In sum...

Science Safari

“Look Mom,
No Driver!”

- Benefits outweigh disadvantages
- Purchaser does not get all benefits and may not be willing to pay
- Subsidies could help
- Adaptive policymaking critical

You can review the entire study at **RAND.org**

- State of technology
- Costs and benefits
- Communications
- Current state law
- Liability issues
- Recommendations for policymakers



Autonomous Vehicle Technology

A Guide for Policymakers

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