ISSN 1936-5349 (print)
ISSN 1936-5357 (online)

HARVARD

JOHN M. OLIN CENTER FOR LAW, ECONOMICS, AND BUSINESS

REAR VISIBILITY AND SOME PROBLEMS FOR ECONOMIC ANALYSIS (WITH PARTICULAR REFERENCE TO EXPERIENCE GOODS)

Cass R. Sunstein

Discussion Paper No. 1013

08/2019

Harvard Law School
Cambridge, MA 02138

Rear Visibility and Some Problems for Economic Analysis (with particular reference to experience goods)

Cass R. Sunstein*

Abstract

In 2014, the National Highway Traffic Safety Administration finalized its rear visibility regulation, which requires cameras in all new vehicles, with the goal of allowing drivers to see what is behind them and thus reducing backover accidents. In 2018, the Trump administration embraced the regulation. The rear visibility initiative raises numerous puzzles. First: Congress' grant of authority was essentially standardless – perhaps the most open-ended in all of federal regulatory law. Second: It is not easy to identify a market failure to justify the regulation. Third: The monetized costs of the regulation greatly exceeded the monetized benefits, and yet on welfare grounds, the regulation can plausibly be counted as a significant success. Rearview cameras produce a set of benefits that are hard to quantify, including increased ease of driving, and those benefits might have been made a part of "breakeven analysis," accompanying standard cost-benefit analysis. In addition, rearview cameras significantly improve the experience of driving, and it is plausible to think that in deciding whether to demand them, many vehicle purchasers did not sufficiently anticipate that improvement. This is a problem of limited foresight; rearview cameras are "experience goods." A survey conducted in 2019 strongly supports this proposition, finding that about 56 percent of consumers would demand at least $300 to buy a car without a rearview camera, and that fewer than 6 percent would demand $50 or less. Almost all of that 6 percent consists of people who do not own a car with a rearview camera. (The per-person cost is usually under $50.) These conclusions may have general implications for other domains in which regulation has the potential to improve people's lives, even if it fails standard cost-benefit analysis;

* Robert Walmsley University Professor, Harvard University. The Program on Behavioral Economics and Public Policy at Harvard Law School provided valuable support. Many thanks to Oren Bar-Gill, Daniel Gilbert, Eric Posner, Lisa Robinson, and Larry Summers for superb comments on a previous draft, and to Ethan Lewans and Zachary Manley for excellent research assistance.

I served as Administrator of the Office of Information and Regulatory Affairs from 2009 to 2012 and spent considerable time on the rear visibility regulation. In general, I rely on the public record, but in some places, I build on personal experience. Some of this essay draws on a section of Cass R. Sunstein, The Most Knowledgeable Branch, 164 U. Pa. L. Rev. 1607 (2016). The analysis has been updated, reoriented, and significantly revised, and the central thrust of the argument has been changed.

the defining category involves situations in which people lack experience with a good whose provision might have significant welfare effects.

I. Introduction

In 2018, the National Highway Traffic Safety Administration (NHTSA) stated its approval of the "rear visibility" regulation, originally issued in 2014, during the prior administration.[1] In brief, the regulation requires all new motor vehicles to be equipped with cameras that allow drivers to see what is behind them. In 2014, NHTSA announced that "systems fulfilling the requirements adopted by today's final rule are the most effective and the most cost-effective systems available for meeting the safety need specified" by Congress and "also afford the best protection to children and persons with disabilities."[2] It is worth noting what the agency chose to emphasize, and what it chose not to emphasize. NHTSA said that of the various options, cameras were the most effective and the most cost-effective, and that they would best protect members of vulnerable groups. It did *not* say that the benefits of the rule justified the costs.

In embracing the 2014 rule, the Deputy Administrator of NHTSA broadly stated, "This technology helps drivers see behind the vehicle, which we anticipate will help save lives and prevent injuries."[3] It is significant that in the Trump Administration, NHTSA explicitly endorsed an expensive regulation issued by the Obama Administration; the former has not been especially reluctant to revisit regulations issued by the latter.

With the Deputy Administrator's statement, the long debate over rear visibility appears to have come to an end. For many reasons, the saga is extremely revealing. I emphasize three points here. *First*: The grant of authority to NHTSA is remarkably open-ended; indeed, it is difficult to find any kind of "intelligible principle" in it. *Second*: On standard assumptions, it is challenging to identity a market failure, justifying the regulation. *Third*: According to the agency's own account, the monetized costs of the regulation far exceeded the monetized benefits. The agency drew attention to a set of benefits that it declined to quantify. It would have done far better to engage in "breakeven analysis," showing that even at a lower bound, the nonquantified benefits would justify the rule on cost-benefit grounds.

I will explore all of these issues here, but my particular interest lies elsewhere: Rearview cameras in motor vehicles confer significant benefits on drivers, but market pressures do not sufficiently register those benefits, because many drivers do not sufficiently anticipate them. Call it a problem of limited foresight, and it has an identifiable source. In an important area of

---

[1] Zoe Szathmary, *Rule Requiring New Vehicles to Have Rearview Technology Goes Into Effect*, FOXNEWS.COM (May 6, 2018), https://www.foxnews.com/auto/rule-requiring-new-vehicles-to-have-rearview-technology-goes-into-effect.

[2] Federal Motor Vehicle Safety Standards; Rear Visibility, 79 Fed. Reg. 19178 (Apr. 7, 2014), https://www.govinfo.gov/content/pkg/FR-2014-04-07/pdf/2014-07469.pdf.

[3] *Id*.

economic theory, rearview cameras count as "experience goods": people do not know their value until they have had experience with them.[4]

Under plausible assumptions, this can produce a market failure, and an important one, but not of a standard kind. It has not (to my knowledge) been explored in analysis of federal regulations.[5] I am suggesting, in brief, that when experience goods are involved, there might be a distinctive ground for federal regulation, justified on welfare grounds, but not adequately captured in ex ante estimates of costs and benefits.[6] The word "might," in the foregoing sentence, is extremely important. Countless goods are experience goods, and even if the experience of experience goods is good, regulators usually should not mandate them. We would need a particular kind of welfare analysis in order to justify a mandate. I will suggest that in the context of the rear visibility rule, the required justification is available.

To bring the idea of experience goods in contact with a prominent psychological finding, there is often a difference between "decision utility" and "experienced utility."[7] At the time of decision, people make a welfare judgment that does not capture their welfare at the time of experience. If rearview cameras are experience goods, and even putting one side the benefits that NHTSA identified but refused to quantify, it is plausible to think that on welfare grounds, the regulation might be justified even if (according to standard measures) the monetized benefits are significantly lower than the monetized costs.

---

[4] See, e.g., David Laband, An Objective Measure of Search Versus Experience Goods, 29 Econ. Inq. 497 (1991). The classic paper, distinguishing between search goods and experience goods, is Phillip Nelson, Information and Consumer Behavior, 78 J. Polit. Econ. 311 (197): "Information by way of experience requires a somewhat different analysis. After using a brand, its price and quality can be combined to give us posterior estimates of the utility of its purchase. Prior to using the brand, all the consumer knows is its price. But this knowledge provides only the roughest sort of guide to choice, for the consumer must assume a generally positive relationship between price and quality. In the absence of any other information, the consumer would not know if he were better off experimenting with low- or high-priced brands." An entertaining application is Jeana Frost et al., People Are Experience Goods, 22 J. Interactive Marketing 51 (2008).

[5] By contrast, there is an extensive literature on other kinds of problems of asymmetric information. See, e.g., Folarin Akinbami, Financial Services and Consumer Protection After the Crisis, 29 Intl Journal of Bank Marketing 134 (2011); Dale Morse, Asymmetrical Information in Securities Markets and Trading Volume, 15 Am. Econ. Rev. 1129 (1980); Scmuel Becher, Asymmetric Information in Consumer Contracts, 45 Am Business L.J. 47 (2008).

[6] On some of the psychological underpinnings, see Daniel T. Gilbert et al., *Immune Neglect: A Source of Durability Bias in Affective Forecasting*, 75 J. Personality & Soc. Psychol. 617 (1998); Daniel T. Gilbert and Timothy Wilson, Miswanting: Some Problems in the Forecasting of Future Affective States. Pp. 178–97 in Feeling and Thinking: The Role of Affect in Social Cognition 178 (Joseph Forgas ed. 2000).

[7] Id.; Daniel Kahneman & Richard Thaler, *Anomalies: Utility Maximization and Experienced Utility*, 20 J. ECON. PERSPECTIVE 221 (2006).

A survey, conducted in 2019 and reported here, supports this conclusion, finding that as many as 94 percent of consumers would demand more to give up rearview cameras than they have to pay for them. The survey also finds that those who value such cameras the least are far less likely to have experience with them, further supporting the conclusion that for drivers who have not had rearview cameras, there is a disparity between decision utility and experienced utility. That disparity might well have general implications for federal regulation, suggesting that ex ante benefit figures may understand ex post welfare benefits. Consider, for example, regulations designed to restrict the amount of time that airlines may keep consumers on the tarmac,[8] or fuel economy regulations that reduce the number of times that drivers have to go to the gas station.[9] In both cases, and all others involved experience goods, there might be an unusual market failure akin to that described here.

II. A Death and A Statute

We begin with a tragedy. In 2002, Cameron Gulbransen was a happy, smiling two-year-old boy.[10] One day, his father decided to back his SUV into the driveway. (In the morning, the street tended to be filled with children and people walking dogs.) As always, he used his side view mirrors and the rearview mirror, and also looked over his shoulder in an attempt to avoid hitting anything. But as he backed in, he heard a small bump on the front wheel and was not sure what it could have been. As it turned out, it was Cameron, who was lying down with his blanket in his hand while bleeding profusely from his head. Cameron died shortly thereafter.

Five years later, Congress enacted the Cameron Gulbransen Kids Transportation Safety Act of 2007.[11] The central provision of the Act states its purpose and provides a deadline: "Not later than 12 months after the date of the enactment of this Act, the Secretary shall initiate a rulemaking to revise Federal Motor Vehicle Safety Standard 111 (FMVSS 111) to expand the required field of view to enable the driver of a motor vehicle to detect areas behind the motor vehicle to reduce death and injury resulting from backing incidents, particularly incidents involving small children and disabled persons."[12]

In a plain grant of discretion, the Act authorizes (without requiring) the Secretary to "prescribe different requirements for different types of motor vehicles to expand the required field of view."[13] In a further grant of discretion, it states that any standard "may be met by the provision of additional mirrors, sensors, cameras, or other technology to expand the driver's

---

[8] https://www.transportation.gov/briefing-room/new-dot-consumer-rule-limits-airline-tarmac-delays-provides-other-passenger

[9] https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EZI1.PDF?Dockey=P100EZI1.PDF

[10] This account comes from the heartbreaking one in *Cameron Gulbransen,* KIDSANDCARS.ORG, http://www.kidsandcars.org/cameron-gulbransen.html.

[11] Pub. L. No. 110-189, 122 Stat. 639 (codified at 49 U.S.C. 30111 et seq.).

[12] *Id.* § 2(b).

[13] *Id.*

field of view."[14] With respect to timing, however, the Act has a degree of rigidity, requiring issuance of a final standard "not later than 36 months after the date of enactment of this Act."[15] At the same time, it authorizes the Secretary to determine "that the deadlines applicable under this Act cannot be met," in which event he must establish new deadlines and "notify the Committee on Energy and Commerce of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate" of those new deadlines with an account of "the reasons the deadlines specified under this Act could not be met."[16]

In that sense, the Act has an unusual structure. Like many other statutes, it obligates the executive to meet a deadline (and thus overcomes its power of priority-setting and time management). But unlike most such statutes, it allows the Secretary not to meet the deadline so long as he offers a public statement of reasons (apparently, but not self-evidently, with judicial review for arbitrariness[17]).

We can see the Cameron Gulbransen Kids Transportation Safety Act as a testimony to the power of the availability heuristic, by which people assess questions of probability of asking whether examples readily come to mind.[18] The name of the statute itself suggests that it was a response to a particular event. To be sure, the name is hardly decisive; perhaps Congress used a particular tragedy to add emotional salience, and particularity, to a problem that it had investigated with care. Congress undoubtedly knew that backover crashes occur and that they sometimes end in tragedy. But what else did Congress know?

From the evidence of the Senate Committee Report, it knew some important things.[19] (I bracket for now a relevant question: the meaning of the word "it" in this sentence.) With respect to cost, the Congressional Budget Office had provided Congress with some help, suggesting that total expense could be in the billions, because "it would cost vehicle manufacturers approximately $350 per car to install the equipment that would best enhance rearward visibility."[20] If we estimate that 17 million vehicles are sold annually in the United States, the total annual cost of the rule would be in excess of 5 billion. (As we shall see, the CBO's cost estimate turns out to have been wildly inflated.) Having asked NHTSA, Congress also had some information about the question of effectiveness; but that information was quite vague. For example, "The data the NHTSA received reported that sensor-based warning systems were generally able to detect adult pedestrians but were lacking in their ability to

---

[14] *Id.*
[15] *Id.*
[16] *Id.* § 4.
[17] There is an argument that the decision not to proceed at a particular time should be immune from review under Heckler v. Chaney, 470 U.S. 821 (1985), but in view of the deadline and the requirement of an explanation, that argument would not be likely to succeed.
[18] *See* Amos Tversky & Daniel Kahneman, *Availability: A Heuristic for Judging Frequency and Probability*, 5 COGNITIVE PSYCHOL. 207 (1973).
[19] REPORT OF THE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION ON S. 694.
[20] *Id*. at 5.

consistently detect child pedestrians. The report stated that camera systems performed well visually in daylight and indoor lighted situations, but required drivers to be able to quickly and accurately interpret the video information to be effective."[21] A reasonable member of Congress might be baffled by this information. Apparently sensor-based systems do not detect children – and children were a central focus of the statute. Apparently cameras can work during the day, but require quick and accurate interpretation by drivers. Are drivers capable of that?

As far as the record shows, no one in Congress, and no one consulted by Congress, did anything like a formal assessment of the likely consequences, including a comparison between costs and benefits. Remarkably, Congress did not even specify a rule of decision (an issue to which I will return). But the Senate Committee Report suggests that an exceedingly large expense was anticipated. Congress therefore had some general information, suggesting that cameras could be effective but that they would also be costly. At the same time, we might question in what sense it is fair to say that "Congress," as such, understood that point. How many members of Congress knew about that possibility? How many of those who strongly supported the Act knew about it? (While writing this essay, I asked such questions to one member of Congress, an extremely intelligent and hardworking Senator, who had been there for enactment of the Act. He had no idea what I was talking about.)

These points raise a larger problem: Why, exactly, did Congress fail to specify anything like standards by which to cabin the discretion of the executive branch? What Congress appears to have done here is to say: "*Here is a problem. Now fix it*." It seems to have done that without giving the executive branch criteria by which to decide what kind of fix would be best. Perhaps that particular question never occurred to relevant members. Perhaps members never even asked about appropriate standards.

Or perhaps they did ask that question, but thought better about trying to enact any answer into law. A cost-blind standard would run into obvious and convincing objections: Should the Department really insist on safety standards that would cost a great deal (billions of dollars?) but generate only modest safety benefits? Would a $5 billion expenditure be justified in order to save (say) 20 lives? In principle, there is much to be said for cost-benefit balancing, but with respect to the lives of young children, could that approach command a consensus within Congress? Would it be acceptable to value a child's life, implicitly or explicitly, at $9 million, or $20 million, or $40 million? From the standpoint of political self-interest and consensus-building, a standard-free statute would have broad appeal.[22]

There is a further problem. Notwithstanding what the Senate Committee Report learned from NHTSA and the CBO, it is fair to think that most members of the enacting Congress had

---

[21] *Id*. at. 3.

[22] These points cast grave doubt on the clever and influential suggestion that because Congress must take political "heat" for failing to speak precisely, it is as accountable for vagueness as it is for specificity. *See* Jerry Mashaw, *Why Administrators Should Make Political Decisions*, 1 J. L., ECON., & ORG. 81 (1985). Sometimes vagueness has unique or decisive political appeal.

little or no information about the problem. They might have known about Cameron Gulbransen, to be sure, and perhaps about other tragic cases, but they did not have anything like detailed information about possible technologies, their likely effectiveness, and their costs and benefits. In these circumstances, the "fix the problem" approach might seem to be attractive.

One final question: If the Act allows the Department a great deal of room to maneuver, does the Administrative Procedure Act impose constraints on the Department's discretion? Of course it forbids action that is "arbitrary" or "capricious." We could well say that some decisions about rear visibility would run afoul of that prohibition – perhaps by imposing large costs for modest benefits, perhaps for failing to obtain significant benefits for low costs. Under Michigan v. EPA,[23] it would appear clear that an agency must weigh advantages and disadvantages, and at least make some comparison between the two. The Court has not yet resolved the question whether and when the arbitrary or capricious test, all on its own, requires the executive to consider costs, and exactly how; but the *Michigan* case gives a strong signal that cost-benefit balancing, of one or another kind, will be mandatory. As we shall see, the rear visibility problem raises challenging questions about what such balancing might entail.

II. The Executive Branch

Now imagine that you are working at NHTSA. Your initial questions ought to be: What, exactly, has Congress directed you to do? How much discretion do you have? It is clear that whatever the answer, you have to do it by a specific date, or explain why that date proved not to be feasible. It is also clear that whatever you do, you "must expand the required field of view" to allow drivers to "detect areas behind the motor vehicle," with the goal of reducing backing incidents, "particularly involving small children and disabled persons." So far, perhaps, so good.

At the same time, you seem to have a great deal of discretion. You are authorized to consider "additional mirrors, sensors, cameras, or other technology." Apparently you can pick one of the three enumerated options, or choose a fourth. You can "prescribe different requirements for different types of motor vehicles." The latter provision seems to disable you from choosing to prescribe *no* requirements -- but on the face of the statute, the available options appear to have a wide range. You could require all motor vehicles to have cameras, or sensors, or additional mirrors. Or you could require some types of vehicles – say, trucks – to have cameras, while requiring all others to have additional mirrors. You could mix and match.

If your options have such a wide range, you might immediately ask: What is my rule of decision? How should you choose among the alternatives? Congress did not say. From the fabric of current law, you might wonder about these possibilities:

[23] Michigan v. E.P.A., 135 S. Ct. 2699 (2015).

1. *A safety-based, cost-blind standard, which would require the technology most likely to improve safety, at the highest level of stringency*

2. *Same as (1), but subject to a constraint of technological feasibility*

3. *Same as (1), but subject to a constraint of economic and technology feasibility*

4. *Same as (3), but also subject to a constraint of cost-effectiveness*

5. *Some form of cost-benefit balancing*[24]

6. *A "least burdensome alternative" standard, which would require adoption of the approach that imposes the lowest costs*

Remarkably, the text of the Act seems to give the Department no guidance on how to think about the choice among the six possibilities. It appears to be close to a blank check. If executive branch officials are effectively given the authority to choose the rule of decision for important regulations – with no constraints on content – might there be a legitimate nondelegation problem[25]? Under longstanding law, the answer would almost certainly be "no,"[26] because the Court has not invoked the nondelegation doctrine to strike down an act of Congress in eighty years (and counting).[27] Nonetheless, the fact that the question is worth asking attests to the breadth of the statutory grant of authority. The Court has long required Congress to offer an "intelligible principle," which would be both necessary and sufficient for validation.[28] It is not easy to identify such a principle here.[29] If the Secretary is permitted to choose among the six approaches sketched above, the nondelegation challenge would seem to be serious. Perhaps the best response to that challenge would invoke context and purpose, and suggest that something like (5) is mandatory.[30]

Since 1981, American presidents have required officials (1) to identify a market failure, (2) to show (to the extent permitted by law) that all regulations pass some kind of cost-benefit

[24] An approach of this kind was given a general endorsement, in the face of congressional ambiguity, in Michigan v. E.P.A., 135 S. Ct. 2699 (2015).
[25] For relevant discussion, see Cass R. Sunstein, *Is OSHA Unconstitutional?*, 94 VA. L. REV. 1407 (2008).
[26] *See* Whitman v. American Trucking Association, 531 U.S. 457 (2001).
[27] Schechter Poultry Corp. v. US, 295 U.S. 495 (1935).
[28] *See* Gundy v. United States, U.S. (2019).
[29] The problem is even more serious if we take Justice Gorsuch's dissenting opinion in id. to reflect the (eventual) law. A dissenting opinion is of course not the law, but Justice Alito indicated receptivity to Justice Gorsuch's approach, see id., which would mean that if Justice Kavanaugh agrees, that approach, or something like it, would have a majority.
[30] See Gundy v. United States, supra note 23; Michigan v. E.P.A., 135 S. Ct. 2699 (2015).

test, and (3) to show that the chosen approach maximizes net benefits.[31] Relevant guidance comes from Executive Orders 12866[32] and 13563.[33] At first glance, the Act unquestionably "permits" the Department to use those ideas as the rule of decision. And because Executive Orders 12866 and 13563 requires the Department to use them if it is permitted to do so, the essential task seems straightforward: *Ensure that the benefits justify the costs, and maximize net benefits*.

But what is the market failure? At first glance, it is not simple to find one. Consumers can demand cameras if they like. We should expect the market to provide diverse offerings, in which consumers who are willing to pay for cameras end up with them. The mix of offerings would change over time, depending on consumer preferences and perhaps decreasing costs. Why should government require all motor vehicles to come with cameras? Why should consumers be compelled to buy them? Why would such a forced exchange be a good idea?

There are two imaginable answers. The first points to externalities: Drivers without cameras might impose risks on others, including property holders, pedestrians, and other drivers. In principle, the argument seems secure; there is no question that drivers hurt others. The question is the magnitude of the effect. Drivers should of course be concerned about risks that they impose on themselves, and any crash imposes risks on them, not merely on third parties. It is doubtful that drivers' concern for their own safety (and that of, say, their children) means that their consumption decisions will take the externalities sufficiently on-board – but that concern should diminish the external harms. This possibility raises some difficult conceptual and empirical issues, which are not yet answered. No one should doubt that unsafe vehicles cause harms that consumers do not fully internalize. The problem here is that the externalities are not high enough to justify a very large expense (as discussed below).

The second market failure points to an inadequate information: Consumers might not have a full sense of the benefits of cameras. Fortunately, a backover crash is a rare event. Can consumers think well about the benefits of reducing the risk that they will occur? To do so, it would be important to know both about the expected probabilities and the likely outcomes; to say the least, it is challenging to know those things. If consumers suffer from unrealistic optimism,[34] the problem will be compounded. Statistical knowledge, even if it exists, might not be enough if consumers also think: I am a good driver, and the risk is essentially zero for me personally.

To be sure, companies that provide cameras should be expected to advertise that fact, while also providing information about their benefits (and also, perhaps, counteracting

---

[31] See Executive Order 13563; Executive Order 12866; Executive Order 12291.
[32] Executive Order 12866 Regulatory Planning and Review, https://www.reginfo.gov/public/jsp/Utilities/EO_Redirect.myjsp.
[33] 76 Fed. Reg. 3821 (Jan. 21, 2011), *available at* http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf.
[34] *See* TALI SHAROT, THE OPTIMISM BIAS: A TOUR OF THE IRRATIONALLY POSITIVE BRAIN (2012).

unrealistic optimism). But such information might not be an adequate corrective. The central point is that *it is not easy to appreciate the benefits of cameras unless one has spent some time driving with them*. Drivers who have driven without cameras, and who are used to navigating without them, might not have a sufficient understanding of what it is like to drive with them. The point is not only about safety; it is also about ease and convenience. To say the least, this is not a standard market failure. It involves limited foresight. It points to the difference between the welfare or utility expected at the time of decision ("decision utility") and the welfare or utility actually enjoyed ("experienced utility" or "experienced well-being"). I speculate that the difference is substantial in this context.

We lack conclusive data, but I will provide suggestive evidence in Part III. It is true that over time, markets should usually be expected to overcome the problem of limited foresight. People learn that electric shavers have significant advantages over straight edge razors, that large cell phones have advantages over small ones, that air conditioning really is great. Over time, products that deliver benefits, in terms of experienced well-being, will be rewarded in markets; information spreads. But in some cases, information spreads relatively slowly, and people can be locked into a suboptimal equilibrium for a long time. Regulation can be a justified response.

If we stipulate that there is a market failure, or if we emphasize that the law requires action even if there is not, the numbers might make NHTSA's task straightforward. Suppose, for example, that cameras cost $400 million and created $600 million in benefits; that sensors cost $100 million and created $80 million in benefits; and that additional mirrors cost $50 million and created $25 million in benefits. With such numbers, the argument for cameras would seem conclusive, and NHTSA would have no discretion under Executive Orders 12291 and 13563. The principal qualification involves "different types of motor vehicles." Suppose that trucks accounted for $100 million of the total cost of cameras -- but $500 million of the total benefits. If so, Executive Orders 12291 and 13563 would appear to require NHTSA to make relevant distinctions, by requiring cameras in trucks but sensors or additional mirrors in other smaller vehicles.

The basic point is that if the numbers work out in certain ways, Executive Orders 12291 and 13563 might make the NHTSA's task fairly straightforward – and sharply constrain its discretion. At least this would be so if the technical experts, within the Department, were able to generate numbers of that relatively precise kind.

I can report that in 2009, officials from NHTSA asked for a meeting with me and offered some numbers on three proposals: mirrors only; sensors; and cameras. They sought preliminary guidance on the likely views of the Office of Information and Regulatory Affairs, which oversees federal regulations.[35] Their early analysis suggested roughly the following. (1) Mirrors would cost very little, but would do almost nothing about the problem. The cost-benefit ratio would

[35] *See* Cass R. Sunstein, *The Office of Information and Regulatory Affairs: Myths and Realities*, 126 Harv. L. Rev. 1838 (2013).

be very bad. (2) Sensors would cost more, but would not do a great deal. The cost-benefit ratio would also be bad, though better than for mirrors. (3) Cameras would prevent a significant number of premature deaths, and indeed were the only approach that would do so, and for them, the cost-benefit ratio was the best of the available options. As I recall, the ratio was something like $15 million per life saved – well above the standard figure, which was and is in the vicinity of $9 million,[36] but well below the corresponding figures for mirrors and sensors.

I was aware that under OMB Guidance[37] and for reasons to be explained shortly, what matters is the net benefits, not the cost-benefit ratio. NHTSA's figures showed that all three options had net costs, not net benefits, and that mirrors had the lowest net costs and that cameras had the highest. Cost-effectiveness analysis, favoring cameras, led in exactly the wrong direction; it suggested that the worst option was the best. It would therefore be standard for OIRA to argue vigorously in favor of mirrors, and perhaps to insist on selection of that option. Nonetheless, and over the objection of some members of my staff, I gave a strong signal that NHTSA should look carefully at cameras, and that we would be likely to be receptive to that approach. For better or for worse, my judgment on that count was a product of three considerations: (1) cameras were the only approach that would significantly dent the problem, (2) very young children were at risk, and (3) there were likely to be nonquantifiable factors, on which we did not have an adequate handle, that would tip the balance.[38]

A. The Proposed Rule

As the analysis was formalized, the official numbers did not make things easy. According to NHTSA's estimates, there are 292 annual fatalities and 18,000 annual injuries from backover crashes.[39] About 44 percent of the fatalities involve children under the age of five; gruesomely, many of those "involve parents (or caregivers) accidentally backing over children."[40] At the proposal stage, cameras would have cost $1.9 billion to $2.7 billion; sensors $300 million to $1.2 billion; and mirrors $600 million.[41] The monetized benefits would have been between

---

[36] *Economic Values Used in Analyses,* U.S. DEPT. TRANSP. (Dec. 21 2016), https://www.transportation.gov/regulations/economic-values-used-in-analysis.

[37] *See* OMB Circular A-4 (2003), available at https://www.federalregister.gov/documents/2003/10/09/03-25606/circular-a-4-regulatory-analysis

[38] For an intriguing discussion, see Arden Rowell, *Partial Valuation in Cost-Benefit Analysis*, 64 ADMIN. L. REV. 723 (2012), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2062987

[39] *See* Federal Motor Vehicle Safety Standard, Rearview Mirrors; Federal Motor Vehicle Safety Standard, Low-Speed Vehicles Phase-In Reporting Requirements, 75 Fed. Reg. 76,186, 76,187 (Dec. 7, 2010).

[40] *Id.*

[41] Federal Motor Vehicle Safety Standard, Rearview Mirrors; Federal Motor Vehicle Safety Standard, Low-Speed Vehicles Phase-In Reporting Requirements, 75 Fed. Reg. 76186, 76236 (Dec. 7, 2010), *available at* http://www.gpo.gov/fdsys/pkg/FR-2010-12-07/pdf/2010-30353.pdf.

$780 million and $920 million for cameras and around $47 million for sensors (and much less for mirrors).[42] Those benefits include deaths and injuries prevented, and also the prevention of property damage. To have a sense of what we are talking about, a statistical life was valued, at the time, at around $6.1 million (it is now over $9 million), which means that in terms of statistical life equivalents, the rule would prevent between 130 and 160 deaths. Because much of the total monetized benefit comes from the prevention of accidents and property damage, the number of actual deaths prevented would of course be significantly lower. (See the discussion of the final rule below for some details.)

Consistent with the analysis during that early meeting, cameras would have been the only effective response to the problem, with the other two contributing very little -- and again cameras would have had, by far, the best cost-effectiveness ratio. There is no question that in terms of cost per life saved, cameras were the best. At the same time, all three options would have negative net benefits, which appears to mean that they would be worse than doing nothing at all – and of the three options, cameras would have, *by far*, the highest net costs. What seems, on one (incorrect) view, to be unquestionably the best option is, on another (correct) view, unquestionably the worst. Congress did not think at all about this prospect, and it might be doubted whether it was equipped to do so. By contrast, the executive branch certainly did.

Under Executive Orders 12866 and 13563, the issue would seem to be at an end, at least on these numbers. (As we shall see, the word "seem" is important here.) NHTSA should do nothing, because no approach would have net benefits, and if it ended up doing something (as the Act seems to require), additional mirrors would be preferable, because they would impose the lowest net costs. Recall in this regard that the decisive question is not the cost-benefit *ratio* (on which cameras look like the best option[43]) but instead the net benefits or costs.[44] The reason is that the latter figure provides valuable information about the social welfare effects, as the former does not. A rule that costs $1 billion but that has $1.5 billion in benefits has a benefit-cost ratio of 1.5 to 1, which is not nearly as impressive as a rule that costs $2 and that has $1000 in net benefits, for a ratio of 1 to 500. But in welfare terms, it is much better to deliver $500 million in net benefits than to deliver merely $998. I have noted that under OMB guidance,[45] the task of the Department is to produce the highest net benefits or the lowest net

---

[42] *See id.* at 76237 (applying a 3% discount rate; benefits with a 7% discount rate were also calculated). The Department did not present a calculation of benefits for additional mirrors because it determined that they had "shown very limited effectiveness and thus would not satisfy Congress' mandate for improving safety." *Id.* at 76239.

[43] Relatedly, the Department calculated the net cost per equivalent life saved to be between $11.8 million and $19.7 million for camera systems, compared to between $95.5 million and $192.3 million for sensors. *Id.* at 76237.

[44] See OMB CircularA-4 (2003), available at https://www.federalregister.gov/documents/2003/10/09/03-25606/circular-a-4-regulatory-analysis

[45] *See id.*

costs, and on those counts, mirrors would be best. The whole point of cost-benefit analysis is to provide information about the effects on social welfare, and on this count, the net figure is what matters, not the ratio.

Under the Act and Executive Orders 12866 and 13563, there is a further question, which is whether to make distinctions among vehicles. It should go without saying that a great deal depends on the costs and benefits of doing so, and to know that, we would have to produce a set of numbers. We could imagine an analysis that would show that it would be best to require cameras on some vehicles and mirrors on others. Here as well, the Department had a great deal of information, some of which is captured in the following table:

Rear Visibility Proposal and Alternatives Discounted at 3%
(Millions of 2007 $) (In decreasing order of installation costs and monetized safety benefits, with LT referring to Light Trucks and PC referring to Passenger Cars)

	Per Vehicle Costs and Benefits				
Proposal and Alternatives	**Installation Costs**	**Monetized Safety Benefits**	**Property Damage Costs**	**Net Costs**	**Net Cost per Equiv. Life Saved**
LT Camera PC Camera	**$1,919 to $2,275**	**$778**	**$ -414**	**$727 to $1,084**	**$11.8 to $14.6**
LT Camera PC Radar	$1,512 to $1,710	$439	$ -149	$924 to $1,122	$18.9 to $21.7
LT Camera PC Ultrasonic	**$1,215 to $1,413**	**$437**	**$ -165**	**$613 to $811**	**$14.7 to $17.4**
LT Camera PC Nothing	$841 to $1,039	$415	$ -189	$237 to $435	$9.6 to $12.5

* The range of camera costs assumes 130 degree camera with the display in the dash (lower cost) to the display in the mirror (higher cost). (75 Fed. Reg. 76,186 at 76,238 n.91)

This table does not include mirrors, but it does show that with different forms of mixing and matching, net costs can move in significantly different directions. Restricting cameras to light trucks, and exempting passenger cars, would have lower net costs (and also higher cost-effectiveness). The precise choice is less important than the general lessons. From this information, we might draw three such lessons: (1) if NHTSA seeks to comply with Executive Orders 12866 and 13563, it should do nothing; (2) if it must do something, it should be inclined to favor mirrors; and (3) whatever it does, it ought to make distinctions among categories of vehicles in a way that maximizes net benefits or minimizes net costs.

But these conclusions raise their own complications. We should agree that the Act requires the NHTSA to do *something*, even if all options have negative net benefits. Inaction is not an option. Indeed, the statute appears to contemplate that the NHTSA must do something with respect to every class of vehicle – even if each class might be treated differently. There is also an argument that the Act does not permit NHTSA to choose an option that has a de minimis effect on the problem that motivated it.[46] If additional mirrors would achieve almost nothing in terms of the statutory goal, it might be taken to be inconsistent with the Act to mandate them, even if the more effective responses had significantly lower net costs. To that extent, engagement with the evidence may have the virtue of sharply narrowing the category of responses that NHTSA might select.

An equally fundamental problem is that the monetized numbers do not capture all of the variables at stake.[47] NHTSA itself emphasized that, with reference to the technical

[46] In its final rule, NHTSA embraced this conclusion, stating that not only that cameras "consistently outperform other rear visibility systems (e.g., sensors-only or mirror systems) but also "are the only systems that can meet the need for safety specified by Congress." Federal Motor Vehicle Safety Standards; Rear Visibility, 79 Fed. Reg. 19179, https://www.govinfo.gov/content/pkg/FR-2014-04-07/pdf/2014-07469.pdf

[47] See Rowell, supra note.

literature, that "the quantitative analysis does not offer a complete accounting."[48] It referred to "equity,"[49] made relevant by Executive Orders 12866 and 13563. It noted that "well over 40 percent of the victims of backover crashes are very young children (under the age of five), with nearly their entire life ahead of them."[50] That can be taken to be a point about life-years.[51] It can also be taken to be a point about the proper valuation of children.[52] The agency added that "this regulation will, in many cases, reduce a qualitatively distinct risk, which is that of directly causing the death or injury of one's own child."[53] That can be taken to be a point about the searing effects of that kind of harm – a risk that is not adequately captured in the standard figure for the value of a statistical risk.

In addition, "drivers will also benefit from increased rear visibility in a variety of ways, including increased ease and convenience with respect to parking."[54] With these points in mind, NHTSA said that if the nonquantified benefits would amount to "$65 to $79 per vehicle, the benefits would justify the costs."[55] The agency said, "Taking all of the foregoing points alongside the quantifiable figures and the safety issue at hand, the agency tentatively concludes that the benefits do justify the costs."[56]

Skeptical readers might have wanted a fuller analysis. Some of the relevant values could have been quantified; NHTSA could have specified upper and lower bounds for (for example) an increase in ease and convenience with respect to driving and parking. But within the Obama Administration, there was general agreement that this approach was sufficient for a proposed rule, designed for public comment. NHTSA had been candid about the numbers and the alternatives. It asked for comments on a wide range of possibilities. It did not commit itself to only one approach. While it emphasized what was quantifiable, it also recognized what was not, and it did not treat the quantifiable as if it were all that mattered.

Officials within the executive branch were broadly supportive of the proposal but keenly interested in public comments, and alert to a number of substantive issues. Of these, three stood out. The first was the evident cost of the proposal. A required regulatory expenditure of $1 billion or more should have to meet a heavy burden of justification, not least in a difficult economic period, when automobile companies were struggling and also facing a number of significant regulatory burdens (perhaps above all involving fuel economy). In any administration, both political officials and technical experts are likely to ask serious questions

[48] Federal Motor Vehicle Safety Standard, Rearview Mirrors, 75 Fed. Reg. at 76238.
[49] *Id.* at 76,238.
[50] *Id.*
[51] *Id.* at 76,238.
[52] See Lisa Robinson et al., Valuing Children's Fatality Risk Reductions, J. Benefit Cost Analysis (forthcoming 2019).
[53] 75 Fed. Reg. at 76,238.
[54] *Id.*
[55] *Id.*
[56] *Id*.

about whether there is an adequate substantive justification for a regulatory burden of this magnitude. Regulations very rarely exceed the $1 billion mark.[57] Indeed, any regulation of that kind would account for a significant percentage of total costs of economically significant regulations any given year.[58] Such an imposition should, in principle, have a compelling justification.

The second concern involved the apparently low benefits of the proposal, at least in comparison to other regulations with similarly high costs. For example, some air pollution regulations would save 1000 or more lives per year,[59] and the Department of Transportation issues regulations expected to save hundreds of lives annually.[60] The rear visibility rule would not have anything like that impact. No one should diminish the costs of even a small number of unnecessary human deaths, not least in the context of deaths of small children killed by their parents. But it must be acknowledged that the benefits of the rear visibility would be far lower than the corresponding benefits for other comparably expensive rules – and that in terms of net benefits, the rule would be a genuine outlier.

The third issue, and in some ways the most pressing, involved the reliability of the evidence on which the benefits had been projected. At least for outsiders, it is natural to wonder whether cameras might prove distracting and counterproductive, at least for some drivers (perhaps older ones), and thus diminish rather than increase safety. NHTSA did not, of course, have a randomized controlled trial. Instead it had experimental evidence, involving the behavior of drivers under artificial conditions, which seemed to support its extrapolations.[61] But for a regulation of this magnitude, the most reliable evidence, involving diverse kinds of drivers and diverse kinds of vehicles, would be highly desirable.[62]

In a letter to members of Congress in 2013, Secretary Ray LaHood elaborated on some of these points.[63] He noted that in the aftermath of the original proposal, the Department

---

[57] *See, e.g.*, https://www.whitehouse.gov/sites/default/files/omb/inforeg/2012_cb/2012_cost_benefit_report.pdf

[58] *Id*.

[59] *Id*.

[60] For examples, *see* CASS R. SUNSTEIN, VALUING LIFE: HUMANIZING THE REGULATORY STATE (2014).

[61] For related evidence, *see* David G. Kidd & Andrew Brethwaite, *Visibility of Children Behind 2010–2013 Model Year Passenger Vehicles Using Glances, Mirrors, and Backup Cameras and Parking Sensors,* 66 ACCIDENT ANALYSIS & PREVENTION 158 (2014), https://www.sciencedirect.com/science/article/abs/pii/S0001457514000104.

[62] *See* Jessica B. Cicchino, *Effects of Rearview Cameras and Rear Parking Sensors on Police-Reported Backing Crashes*, 18 TRAFFIC INJURY PREVENTION 859 (2017), https://www.tandfonline.com/doi/abs/10.1080/15389588.2017.1317758.

[63] Letter from Ray LaHood, Secretary, U.S. Department of Transportation, to Fred Upton, Chairman, Committee on Energy and Commerce, U.S. House of Representatives, et. al. (Jun. 20, 2013), http://www.citizen.org/documents/In-re-gulbransen-LaHood-Delay-Letters-6-20-13.pdf

completed "additional research, which included not only a different vehicle type, but also 143 additional participants."[64] In his account, the new work "has expanded and increased the robustness of the available information on the backover crash problem as well as on the ability of drivers to use rear visibility systems to their advantage in avoiding backover crashes."[65] At the same time, he said that "the Department believes that analyzing additional information through its Special Crash Investigations program will contribute significantly to its understanding of the backover crash problem. By identifying and analyzing cases that involve vehicles equipped with rear visibility systems, the Department will be able to further refine its understanding of how the proposed requirements address the real world safety risk."[66]

Between the proposal and 2014, all of these issues received extensive discussion among a variety of officials, including above all technical experts. To this point it might be added that the executive branch was dealing with a large number of regulations, many of them required by law. At any given time, the Department of Transportation was focused on a wide range of priorities. At any given time, OIRA, with its staff of about forty-five people, was dealing with 120 or more regulations, each of which was also subject to interagency scrutiny. Important issues must sometimes take a temporary back seat to other issues; there is inevitably a queue.

B. The Final Rule

The regulation was finalized in 2014.[67] NHTSA estimated 267 annual deaths and 15,000 annual injuries (6000 of which are incapacitating) from backover crashes.[68] It added that children under 5 years old account for 31 percent of the fatalities each year, and that adults 70 years of age and older account for 26 percent.[69] It stated that cameras would have effectiveness rates of between 28 and 33 percent, which would mean that they would save between 58 and 69 lives annually, compared with a situation in which vehicles lacked cameras.[70] It was emphatic that the approach it chose was the only way to satisfy the law, stating in italics, "*This Rule is the Least Costly Rule that Meets the Requirements of the K.T. Safety Act."*[71]

---

[64] *Id*.
[65] *Id*.
[66] *Id*.
[67] Federal Motor Vehicle Safety Standards; Rear Visibility, 79 Fed. Reg. 19178 (Apr. 7, 2014), *available* at http://www.gpo.gov/fdsys/pkg/FR-2014-04-07/pdf/2014-07469.pdf; Press Release, U.S. Department of Transportation, NHTSA Announces Final Rule Requiring Rear Visibility Technology (MAR. 31, 2014), https://www.transportation.gov/briefing-room/nhtsa-announces-final-rule-requiring-rear-visibility-technology.
[68] 79 Fed. Reg. 19,179.
[69] *Id*. at 19,180.
[70] *Id*.
[71] *Id*. at 19,181.

In terms of both costs and benefits, the most important change from the proposal stemmed from the fact that the automobile industry was moving rapidly in the direction of installing cameras on its own – which would decrease both costs and benefits substantially.[72] According to the Department, about 73% of covered vehicles would have rearview video systems by 2018, *even without the regulation*.[73] With that assumption, the rule would cost $546 million to $620 million.[74] This is a large amount in aggregate, but it is also useful to emphasize this finding: "We anticipate rear visibility systems will cost approximately $43 to $45 for vehicles already equipped with a suitable visual display and between $132 and $142 for all other vehicles."[75] (Most contemporary vehicles have a suitable display.) In terms of social welfare, it is worthwhile asking whether those relatively small amounts might have modest adverse effects on consumers of new vehicles. A high but widely dispersed monetary cost might give a misleading picture of the welfare effects. If (say) a regulation requires 100 million people to pay $20 annually, the annual cost of $2 billion might overstate the welfare effect of the regulation.[76]

The rule would produce $265 to $396 million in monetized benefits, including prevention of 13 to 15 annual deaths and 1,125 to 1,135 annual injuries.[77] ("Thus, we believe that there will still be 13–15 fatalities and 1,125–1,332 injuries prevented annually that are a result of equipping the remaining 27% of vehicles that we do not anticipate will have rear visibility systems by 2018.") The agency was aware that the proposed rule might itself have accounted for some of the growth of cameras and that without the rule, adoption might be as low as 59%, which would increase the costs to $827 million to $924 million, and increase the benefits from $398 million to $595 million.[78] Because of the growth of voluntary adoption of cameras, the agency expected to prevent a small number of preventable deaths each year.[79] In addition, the Department's value of statistical life had changed, in the interim, to about $9 million.[80]

---

[72] *Id.* at 19179.
[73] *Id.*
[74] *Id*.
[75] *Id*.
[76] *See, e.g.,* John Bronsteen et al., *Well-Being Analysis versus Cost-Benefit Analysis*, 62 DUKE L. J. 1603 (2013); PETER DORMAN, MARKETS AND MORTALITY (1996).
[77] 79 Fed. Reg. 19179.
[78] 79 Fed. Reg. 19179. It is reasonable to wonder about the relationship between the original proposal and the growth of cameras in motor vehicles. Companies might have concluded that the handwriting was on the wall, so to speak, and that it made sense to act before the regulation was finalized. The effect of proposed regulations on behavior is an important and understudied question.
[79] *See* Federal Motor Vehicle Safety Standards; Rear Visibility, 79 Fed. Reg. 19178, 19180.
[80] *See* Memorandum from Polly Trottenberg and Robert S. Rivkin, Office of the Secretary of Transportation, to Secretarial Officers Modal Administrators (Feb. 28, 2013), http://www.transportation.gov/sites/dot.dev/files/docs/DOT%202013%20Signed%20VSL%20M

Its summary table took the following form[81]:

emo.pdf. Note that this was a technical document, not a political one, and that it was a result of peer review.

[81] 79 Fed. Reg. 191,181 (2014). "The different estimates in this chart show some of the different potential technology options. The Primary Estimate is the lowest installation cost option (which assumes manufacturers will use a 130° camera and will utilize any existing display units already offered in their vehicles). The Low Estimate and High Estimate provide the estimated minimum and maximum net impacts possible. The Low Estimate is the 180° camera and assumes that manufacturers will install a new display to meet the requirements of today's rule. It represents the minimum overall benefit estimate as it has the largest negative net impact. Conversely, the High Estimate is the 180° camera and assumes that manufacturers that currently offer vehicles with display units are able and choose to use those existing display units to meet the requirements of today's rule. This represents the maximum overall benefit estimate because it has the smallest negative net impact." 79 Fed. Reg. 191,181, n.13 (2014).

SUMMARY OF BENEFITS AND COSTS PASSENGER CARS AND LIGHT TRUCKS (MILLIONS 2010$) MY2018 AND THEREAFTER

*The range presented is from a 3% to 7% discount rate.

	Primary Estimate	Low Estimate	High Estimate	Discount Rate
Benefits				
Lifetime Monetized	$265	$305	$305	7%
Lifetime Monetized	$344	$396	$396	3%
Costs				
Lifetime Monetized	$546	$620	$557	7%
Lifetime Monetized	$546	$620	$557	3%
Net Impact				
Lifetime Monetized	-$281	-$315	-$252	7%
Lifetime Monetized	-$202	-$224	-$161	3%

These various numbers raise many further questions. Even with a degree of market penetration, mandatory cameras would cost hundreds of millions of dollars, without the kinds of safety benefits usually associated with rules having that expense. Return then to the options of sensors and mirrors; might either approach be preferable to cameras? The Department concluded, for highly technical reasons, that both would be inadequate. With respect to sensors, the agency found, on the basis of its own evidence, "that sensor-only systems have various technical limitations that lead to inconsistent object detection and that drivers with sensor-only systems generally either failed to respond to the sensor system's audio warning, or paused only momentarily before resuming the backing maneuver."[82] With respect to mirrors, the agency found "that drivers were unable to avoid targets behind the vehicle when assisted with additional rear-mounted mirrors such as rear convex 'look-down' or cross-view mirrors."[83]

Perhaps surprisingly, and somewhat disturbingly, the agency did not offer actual benefits numbers for the two less expensive approaches, but it did say that "sensor-only and mirror-based rear visibility systems have demonstrated little to no success in inducing drivers to stop a backing maneuver to avoid a crash with a pedestrian behind the vehicle."[84] Hence "their lower cost is outweighed by the substantially reduced benefits that are likely to be achieved by these systems."[85] In these circumstances, cameras would be "not only the most effective systems at addressing the backover safety problem but also the most cost effective system"[86] – and also the only way to fulfill the requirements of the Act "as these other systems cannot be reasonably expected to address the backover crash problem." It added that ultrasonic sensor

[82] *Id.* at 19182.
[83] *Id.*
[84] *Id.* at 19183.
[85] *Id*.
[86] *Id.*

systems would be far more expensive than originally thought, costing between $79 and $138 per vehicle.[87]

What about the fact that the quantifiable benefits were lower than the quantifiable costs? On this count, NHTSA emphasized that "a simple quantitative analysis is not sufficient."[88] It drew attention to equity. It noted that "victims of backover crashes are frequently the most vulnerable members of our society (such as young children, the elderly, or persons with disabilities).[89]"[90] It pointed to "strong reasons, grounded in unquantifiable considerations, to take action to prevent the deaths and injuries at issue here."[91] It stated that "most people place a high value on the lives of children and that there is a general consensus regarding the need to protect children as they are unable to protect themselves."[92] It said, "While the agency has used the Department's standard monetary figure for the value of a statistical life, we acknowledge that various studies have placed the value of a statistical life at a higher value and the value of a statistical life of a child even higher."

It added: "In many cases, parents are responsible for the deaths of their own children. We continue to believe that avoiding that horrible outcome is a significant benefit which is not fully or adequately captured in the traditional measure of the value of a statistical life."[93] It stated that "an exceptionally high emotional cost, not easily convertible to monetary equivalents, is often inflicted upon the families of backover crash victims."[94] It emphasized: "Of course, any death of a young child is a tragedy, but we believe that this traditional measure also does not adequately account for the value of reducing the risk that parents will be responsible for the death of or serious injury to their own children."[95] It referred to distributional impacts more broadly, including not only children but also people with disabilities and the elderly. "Especially in the context at issue, such people lack relevant control over the situation and are not in a good position to protect themselves. There are strong considerations, rooted in fairness and equity, to reduce these risks that they face."[96]

It briefly noted as well that "[d]rivers will benefit in numerous ways from increases in rear visibility. For example, parking will be simplified, especially in congestion."[97] The increase

[87] *Id.* at 19237.
[88] *Id*. at 19,235.
[89] *Id*. at 19,236.
[90] *Id*. at 19180.
[91] *Id.* at 19236.
[92] *Id*. at 19,180-19,181.
[93] *Id.*
[94] *Id*. at 19,181.
[95] *Id*. at 19,236.
[96] *Id*.
[97] *Id.*

in "ease and convenience" would provide "significant, but not yet quantifiable, benefits to drivers."[98]

C. Breakeven Analysis

It is surprising and disappointing that the Department did not undertake a formal breakeven analysis, which would have explored what the benefits would have had to be to justify the costs, and which would have analyzed the assumptions that would support the conclusion that they did.[99] Perhaps it declined to do so on the ground that any such analysis would rest on highly speculative assumptions. But it would nonetheless have been possible. The crudest form of such an analysis would have noted that the monetized shortfall was in the vicinity of $200 million,[100] and hence the question was whether the nonquantifiable values could make up the difference. Taken in the abstract, and without saying more, that question is difficult to answer. But the Department might have made a great deal more progress by saying a bit more about the relevant values.

Most obviously, the Department properly referred to the increased ease and simplification of driving. Suppose that the relevant annual improvement is valued at merely $20, admittedly a somewhat arbitrary figure, and taken as a reasonable lower bound. Suppose too that the regulation would apply to eight million cars that would otherwise lack cameras. If so, it would produce $160 million in additional benefits. At that point, the monetized benefits become very close to the monetized costs. We are near the breakeven point.

The Department might have also noted that some preliminary work suggests that parents value a young child's life at $18 million[101] – a number that would add $45 million to its existing benefits figure.[102] At that point, the benefits and costs are essentially equivalent. And indeed, that $18 million figurer captures the parents' valuation of children's lives, not children's valuation of their lives. It would have been an unusual step in view of the tentative nature of the existing research, but the Department might have undertaken a sensitivity analysis with values of $18 million and $27 million – with the latter adding $90 million, leaving a shortfall of $110 million. When the monetary value of additional ease of driving ($160 million) is added in the mix, the rule no longer has a shortfall at all. Perhaps we could say that the $160 million is a reasonable lower bound for that additional ease and that even at a reasonable lower bound, the value of protecting young children would add $40 million, meeting the costs.

---

[98] *Id*.

[99] I borrow here and in the following paragraphs from Cass R. Sunstein, *The Limits of Quantification*, 102 CAL. L. REV. 1389 (2014).

[100] This is of course an approximation, used for purposes of simplifying the analysis.

[101] *See* Sean Williams, *Statistical Children*, 30 YALE J. REG. 67 (2013).

[102] An alternative approach and number, also in excess of the standard amount, can be found iN Robinson et al., supra note.

Recall finally that we are speaking here of parents who would not only (only!) lose their children, but who would also be directly responsible for that loss. How much would it be worth to reduce the risk of that eventuality? Any reasonable lower-bound figure would fortify the conclusion that the costs would be justified. With an analysis of this admittedly tentative kind, the Department's conclusion seems eminently sensible – not because of a laundry list of nonquantifiable benefits, but because once we begin to speak of lower bounds and expected ranges, an apparently intractable puzzle begins to dissolve, or at least to look far more tractable.

III. Willingness to Accept, Willingness to Pay, and Experience Goods

My largest concern here is the possibility that rearview cameras will greatly improve drivers' experience, even if consumers are not demanding such cameras in advance, and even if the market is not providing (enough) cameras. If so, cameras may count as experience goods, for which "information about the product's quality or performance can be obtained only through buying and using the item."[103] We might see experience goods as involving an information problem. Advertising and search are not enough to provide the relevant information. But we might also see them as involving preference change. After using a product, people's tastes might shift, not only because they know something they did not know before, but also because they end up valuing something that they did not value before. Compare a situation in which people learn that it is easier to drive with rearview cameras, and so value those cameras more than they thought they would, to a situation in which people's preferences for how to drive (including how much they like craning their necks) undergo a shift as a result of the new experiences. To be sure, it will be difficult to know whether we are dealing with information-induced preference change, or a change in preferences that goes beyond an increase in information. In either case, it is a knotty question whether there is an argument for a regulatory mandate.[104]

---

[103] See Laband, supra note, at 497. The idea was introduced in Phillip Nelson, Information and Consumer Behavior, 78 J Polit Econ 311 (1970). There is an extensive literature. See, e.g., Lisa Klein, Evaluating the Potential of Interactive Media through a New Lens: Search versus Experience Goods**,** 41 J. Business Research 195 (1998); Jeana Frost et al., People Are Experience Goods, 22 J. Interactive Marketing 51 (2008); Dirk Bergemann and Juuso Välimäki, Dynamic Pricing of New Experience Goods, 114 J Polit Econ 713 (2006); Pnina Feldman et al., Social Learning and the Design of New Experience Goods (2017), available at http://faculty.haas.berkeley.edu/feldman/assets/sl_quality_2017.pdf

[104] Consider a stylized situation. People are broadly content with situation or product X. They do not particularly want situation or product Y. Once they experience Y, they no longer like X. They cannot even understand how they could ever have liked X. Does this justify a mandate of Y? Some initiative to produce Y? To say the least, the answer is not clearly yes. With respect to rear visibility, the claim is not merely that the experience of Y makes X seem bad or less good; it is that (many) people have learned that the experience of driving with rearview cameras is much better than they thought or could have expected.

Let us put the largest questions to one side. As an empirical matter, it is not easy to test the possibility that rearview cameras are experience goods. To obtain some information, I conducted a brief survey of 403 Americans, using Amazon's Mechanical Turk:

> *As you may know, new motor vehicles in the U.S. are equipped with "rearview cameras" - a dashboard display that allows drivers to see behind them as they back up or try to park.*
>
> *Suppose that you are buying a new car, and that the car dealer is willing to sell you the car of your choice with a rearview camera -- or without one, at a reduced price. How much would the dealer have to pay you, in a reduced price, to get you to buy a car without a rearview camera?*

The answers fell in the following categories:

Less than $50 - 5.26%
$50-$99 - 7.77%
$100-$199 - 13.28%
$200-$299 - 16.79%
$300-$399 - 12.78%
$400-$499 - 8.77%
More than $500 - 35.34%

What is noteworthy here is that is that 94 percent of respondents would be willing to pay more than the standard amount for cameras ($43 to $45, for vehicles with modern displays) – and that a lower bound of 74 percent would be willing to pay more than the high-end amount ($132 to $142, for vehicles without such displays). We might hypothesize that driver experience contributes to the relatively high numbers; those who have driven cars with cameras do not want to drive cars without them. A "pure" endowment effect might also be at work.[105] Through the phrasing of the question, people are asked to assume that cars do have cameras, and the question is how much they would demand to give them up (rather than pay to get them in the first place). When an endowment effect is at work, willingness-to-accept will be higher than willingness-to-pay, and we might question whether willingness-to-accept captures the welfare effects of a good.[106]

With these issues in mind, I did another survey with this question:

> *As you may know, new motor vehicles in the U.S. are equipped with "rearview cameras" - a dashboard display that allows drivers to see behind them as they back up or try to park.*

[105] See id.
[106] Shane Frederick et al., Opportunity Cost Neglect, 36 J. Consumer Research 551 (2009).

How much would you be willing to pay for a rearview camera in a car?

The results are consistent with the hypothesis of an endowment effect, accounting for a significant disparity between willingness to accept and willingness to pay. Notice the much higher numbers:

Less than $50 - 12.90%
$50-$99 - 27.05%
$100-$199 - 29.03%
$200-$299 - 19.35%
$300-$399 - 5.71%
$400-$499 - 2.98%
More than $500 - 2.98%

But even with willingness to pay, more than 87 percent would be willing to pay more than the standard cost of a camera. In both versions of the survey, I also asked people whether they own a car with a rearview camera. I hypothesized that cameras are experience goods, and thus that drivers would learn to value such cars from experience; if they did not own one, their valuation would be lower. The hypothesis was supported. In the willingness to accept condition, the low figures were dominated by people who do not own such a car: of the 21 people who said they would demand less than $50, only one had such a car. The numbers are less dramatic but in the same direction in the willingness to pay condition: of the 52 people who said that they would be willing to pay less than $50, only 14 owned such a car. On the high end, the results were more ambiguous. Of the 141 who would demand more than $500, 72 owned such a car, as compared to 69 who did not. Of the 11 who would be willing to pay more than $500, nine owned such a car; because of the small number of people in this category, it would be a mistake to make much of the finding, but it is suggestive.

The most important findings here involve the low numbers, which are dominated by people with cars lacking rearview cameras. Whether we are speaking of willingness to accept or willingness to pay, those who have had experience with such cameras are overwhelmingly to believe that they are worth more than $50.[107] Those findings are consistent with the view that on net, consumers are benefiting from rearview cameras.

I have referred to the problem as one of limited foresight, and it helps illuminate a number of other actual or potential regulatory interventions; many such interventions might be increasing the provision of experience goods. One of the advantages of vehicles with high fuel economy is that drivers save time; they do not have to go to the gas station neatly often. Do consumers sufficiently take account of this benefit when they purchase vehicles? We do not know, but perhaps not. The U.S. Department of Transportation has issued a series of rules

[107] It is possible, of course, that some participants actively sought out cars with cameras in a period in which they were not mandated, which would mean that their high willingness to accept or willingness to pay might be a product of preference rather than experience.

designed to protect airline passengers, for example by forbidding certain delays on the tarmac. It is fair to ask: What is the market failure? Perhaps there is none; perhaps the rules are unjustified. But perhaps consumers have not been sufficiently attentive to the welfare costs of those delays, either because of insufficient experience or because they have been low-probability events.

It is true and important to say that markets can and do handle experience goods,[108] and that regulation is not hardly justified merely because such goods are involved. People obtain experience, and they make decisions accordingly. Word-of-mouth can do a great deal to communicate the value of such goods; social learning is critical.[109] "Surrogation" has been proposed as a solution to "hedonic forecasting errors" – as, for example, when people learn how other people experienced an event or a product.[110] Surrogation is experienced, in one or another form, every day. Markets can promote it.

It is also true that producers can adopt innovative approaches to solve the problem -- as, for example, through free or low-cost trial periods. What remains to be specified are the circumstances in which markets fail because (for example) learning and producer approaches fail. It should be emphasized that the broadest proposition – that experience goods present a case for regulatory mandates – is far too broad and risks a serious slope problems. The only point is that under specific assumptions about market failure and welfare benefits, experience goods can provide a plausible ground for regulation, and that rearview cameras appear to be a case in point. A great deal of work remains to be done on this topic.

IV. Courts: A Note

The final rule was not challenged in court – an interesting fact that might be taken as a testimony to its essential reasonableness (and perhaps the extreme awkwardness, in terms of the "optics," of an industry-led challenge to a rule designed to save the lives of young children). But it is easy to see the form that such a challenge might take. I have noted the possibility of a nondelegation challenge. On arbitrariness grounds, there were many possible avenues:

(1) Companies could argue that the agency lacked sufficient evidentiary basis for its benefits calculations, which were based, in part, on an extrapolation from experimental evidence.
(2) Companies could contend that the costs were wildly underestimated, and that without the government's own initial proposal, moving the market toward cameras, an estimate of $1 billion or more would be more accurate.

---

[108] As emphasized in the original treatment. See Nelson, supra note. See also Services As Experience Goods, 95 Am Econ Rev 1444 (2005).
[109] See Feldman et al., supra note.
[110] See Daniel Gilbert et al., The Surprising Power of Neighborly Advice, 323 Science 1617 (2009).

(3) Companies could object that it was arbitrary for the agency to proceed in the face of a "benefits shortfall" of hundreds of millions of dollars.
(4) Companies could argue that if the agency was to consider nonquantified factors, it was arbitrary for it not to attempt to quantify those factors, or at least to explain why it failed to do so.
(5) Companies could argue that it was arbitrary for the agency to disregard the less burdensome options (sonar and mirrors) without quantifying their costs and benefits.[111]

Under existing law, some of these challenges might have a genuine chance of success.[112] It is a bit puzzling that none of them was brought. Public relations might have played a role. Because most new cars were being equipped with cameras, and because they promised to save lives, companies might have thought that it would be unwise to mount a legal challenge, and that it would be prudent simply to comply.

Conclusion

In terms of monetized costs and monetized benefits, the rear visibility rule seems highly questionable. On welfare grounds, it looks much better. The rule confers many benefits that are difficult to monetize. Apart from the savings in terms of premature death and property damage, the rule improves the experience of driving for many people. The dispersed nature of the cost may also be relevant: If we stipulate that the per vehicle cost is generally in the vicinity of $45, the negative welfare effect (putting to positive effect to one side) is reasonably taken to be modest, even if the aggregate monetary cost is high.[113] A breakeven analysis suggests that the rule is a good idea.

There is a separate point, and it involves the possibility that ex ante, drivers will not demand, or willing to pay much for, a good that will greatly improve their experience. Rearview cameras may well be experience goods. My own survey strongly suggests that this is the case: Experience with rearview cameras increases drivers' valuation of them, and drivers do not sufficiently appreciate the benefits of cameras in advance. It is plausible to think that federal regulation might increase welfare when experience goods are involved. This, then, is a situation in which analysis of monetizable costs and monetizable benefits provides essential information, but does not provide anything close to an adequate account of the welfare effects of an important federal regulation.

[111] *See* Corrosion Proof Fittings v. EPA, 947 F.2d 1201 (1991).
[112] *See* Business Roundtable v. SEC, 647 F3d 1144 (DC Cir 2011).
[113] *See* CASS R. SUNSTEIN, THE COST-BENEFIT REVOLUTION (2018).