



DRIVERS OF SAFETY

The Outdated Practice of MOT Testing

By Alex Hoagland

BRIEFING PAPER

EXECUTIVE SUMMARY

- The MOT requires drivers of any vehicle older than 3 years to pay between £30 and £80 annually for vehicle safety inspections, generating over £250 million in yearly revenue for more than 20,000 garages throughout Britain. However, this industry has not been rigorously evaluated for over 20 years.
- The idea of vehicle safety inspections is an outdated one stemming from widespread use of unsafe vehicles in the 1950s. Over the years, reforms have added burdens to drivers rather than removed them due to an unsubstantiated assumption that inspections increase safety. However, this assumption has proven to be inaccurate.
- As vehicle technology increases, annual safety inspections are rendered more and more useless. While the MOT has remained essentially unchanged for half a century, improvements in vehicle safety technology mean traffic fatalities have dropped to just 57% of what they were a decade ago.
- Mechanical failure accounts for merely 2% of all accidents in the United Kingdom, the same rate as other regions that do not require comparable inspections (for example, the greater portion of the United States).¹ A recent 2018 study performed in the United States shows that discontinuing these inspections has no effect on either the rate or severity of accidents due to mechanical failure.²
- Furthermore, over 65% of accidents in the United Kingdom are due to driver-specific behaviors, such as driving with excessive speed, driving under the influence of alcohol, or forgoing the use of a seat belt while travelling—none of which an annual MOT test can prevent.
- If the MOT is not abolished, it should at least be overhauled substantially to place emphasis on driver-specific behaviors, rather than vehicle-specific ones.

¹ National Highway Traffic Safety Administration (2015) “Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey” Crash Stats <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812115>

² Hoagland, A., & Woolley, T. (2018). “It’s No Accident: Evaluating the Effectiveness of Vehicle Safety Inspections” *Contemporary Economic Policy*. Online: <https://onlinelibrary.wiley.com/doi/full/10.1111/coep.12284>

At a minimum, the age of testable cars ought to be increased and the frequency of inspections reduced.

INNER WORKINGS OF THE MOT TEST

In an effort to maintain and improve road safety, drivers in the mainland of the United Kingdom are required to submit their vehicles for an annual inspection of vehicle safety and exhaust emissions. This test is referred to as the MOT test (Ministry of Transport test), and is currently required yearly by the Department for Transport for most vehicles over three years old. Today, at least 20,000 garages throughout Great Britain provide this service, which costs drivers up to £29.65 for motorcycles and £54.85 for cars, with the average fee ringing in at £33.60.^{3 4} The actual inspection price varies by garage, with lower MOT prices usually signalling higher markups on the replacement parts a driver may need to whip their vehicle into shape. In fact, most garages rake in handsome sums not only administering the MOT, but also performing the (typically small) repairs necessary to help a vehicle pass: the average driver will pay £143 in repair costs before the vehicle is ready to pass inspection.⁵

Between inspections and repairs, MOT testing generates about £250 million a year in revenue for local garages. This sizeable industry has gone for over 20 years without being seriously evaluated; however, recent evidence suggests that these inspections have almost no effect on road safety.

HISTORY OF THE MOT TEST

Following the economic uncertainty of the second world war, and continuing through the 1950s, many drivers in the United Kingdom relied on second-hand vehicles for transportation. Many of these vehicles—most of which had been manufactured prior to 1940—had not been regularly serviced since their initial sale, and had many defects that made them potentially unsafe. To stem the flood of these potentially unsafe vehicles, the then Ministry of Transport instituted the “ten year test” in 1960, which required an annual inspection of steering, brakes, and lighting for all vehicles over ten years old. The name for the test quickly shortened to simply “the MOT”, and soon after (in 1967) the age of testable vehicles was reduced to three years. While the particulars of the test have fluctuated under various administrations (most notably including the introduction of an emissions component in the 1990s), the core components of the test have remained unexamined since its initiation.

³ [Department for Transport MOT Testing](#), 2018.

⁴ [“Average Cost of a MOT,”](#) Nimble Fins, February 2018.

⁵ [“Updated MOT Repair Costs,”](#) This is Money, 22 May 2018.

Recent iterations of the MOT have resulted in increased burdens on drivers, with many non-critical vehicular issues becoming necessary standards for passing the test, such as the backlighting of the dashboard or speedometer.⁶ A 2018 update of the MOT test made the test as extensive as it has ever been, now requiring that inspectors fail cars for details such as the lighting of any warning lights on the dashboard or problems with headlight washers.⁷

However, other proposed reforms designed to remove unnecessary burdens have been rejected, almost universally on the grounds of unjustified safety concerns. For example, in 2018 the government consulted on extending the testable vehicle age from three years to four. The proposal was rejected in part because public consultation suggested that “the safety risk outweighed [any] potential saving”.⁸ Numerous groups spoke out against the proposed change and the supposed safety risk it would entail; however, each of the proposal’s opponents relied entirely on conjecture and extrapolation to justify these claims. The RoSPA, for example, erroneously attributed recent declines in vehicle crashes and casualties in Great Britain to the MOT system and cited historic failure rates as suggestive evidence that removing these inspections “could result in a possible increase in road deaths and serious injuries.”⁹ Without a clear link between MOT tests and safety improvements, however, such appeals to existing data are insufficient to support this claim.

While many citizens and government officials appeal to the MOT test as a sentinel of road safety, no empirical work has been done verifying that these inspections have any true influence.

CHANGES IN VEHICLE SAFETY

With the rise of competition and improvements in safety technologies, however, vehicle manufacturers are producing and distributing safer and more reliable vehicles, resulting in substantial improvements to road safety. In Great Britain, for example, road accident fatalities have dropped to just 57% of what they were a decade ago, from 3,172 in 2006 to 1,792 in 2016 (see Figure 1).¹⁰ Additionally, 2016 saw the lowest year on record for total road accident injuries with a total of 181,384. These reductions most closely track the introduction of newer vehicles into the pool of those driven in the UK, suggesting that it is the increased safety of newer cars—rather than the effectiveness of the MOT test—driving the increase in road safety.

⁶ [“MOT Test of the Instrument Panel,”](#) MOT Testing, 19 May 2018. See [“MOT Rule Changes: 20 May 2018”](#) (Driver and Vehicle Standards Agency, 20 May 2018) for a list of complete changes.

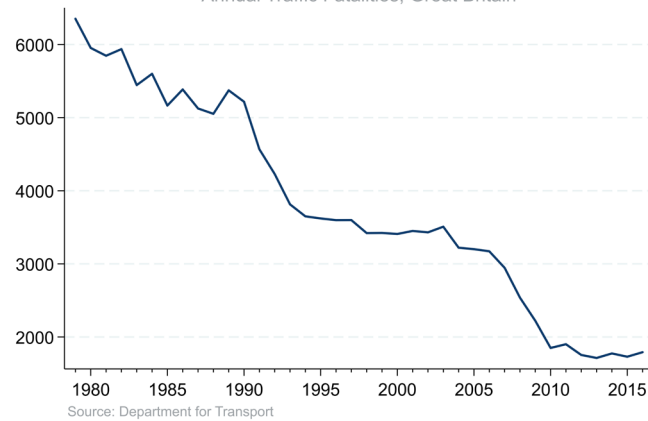
⁷ [“MOT Rule Changes, 20 May 2018,”](#) Department for Transport, 20 May 2018, and [“MOT Test Changes Explained,”](#) The Mirror, 20 May 2018.

⁸ Tisshaw, Mark. “Four-year MOT Exemption for New Cars Scrapped”, Autocar, 18 January 2018.

⁹ [“RoSPA Response to the Department for Transport...,”](#) The Royal Society for the Prevention of Accidents, 10 April 2017. Emphasis added.

¹⁰ Reported Road Casualties in Great Britain: 2016 Annual Report, Department for Transport, 28 September 2017 (the most recent available data).

Figure 1
Annual Traffic Fatalities, Great Britain



While the rate of traffic accidents has fallen in general, the proportion of accidents due to vehicular failure has fallen even more sharply. In fact, only 2% of all accidents in 2016 involved any form of mechanical failure, a rate which has been constant for at least 10 years.¹¹ This rate compares to regions of similar demographics that do not require safety inspections, such as the majority of states in the United States.¹² Instead, the main causes of accidents today are driver-specific: a study performed by David Clarke and co-authors in 2009 identified that over 65% of accidents in the UK are due to factors such as driving at excessive speeds, abusing alcohol or other drugs, or travelling without a seat belt.¹³

As newer vehicles, equipped with the latest improvements in safety technology, enter the roadways, the chasm between driver- and vehicle-caused accidents is only expected to grow. The improvements in safety technology are not limited to specific developments, but range across every vehicle component, from higher-strength steel to the standardization of safety features such as the electronic stability control system, which slows individual tyres during a turn in order to keep a car on course. The results from such improvements and standardizations are staggering: as early as 2012, the U.S. Department of Transportation's National Highway Traffic Safety Administration estimated that safety improvements since the year 2000 had prevented the crashes of over 700,000 vehicles in the United States alone, saving over 2,000 lives a year by the year 2008 and eliminating over 1 million passenger injuries.¹⁴ Cars are becoming smarter and safer, and accidents are directly declining as a result.

¹¹ Using the Annual Reports from the Department for Transport from 2007 to 2016. Archived reports are available from 2001 onwards; however, 2007 is the first such report to identify the number of accidents due (at least in part) to mechanical failure. For example, Table RAS50001 [here](#) contains the data from 2012 to 2016, and older data is accessible [here](#).

¹² New Jersey, for example, maintained a constant rate of 2% of accidents due to mechanical failure both before and after discontinuing their program for vehicle safety inspections (Hoagland & Woolley, 2018).

¹³ Clarke, D. D., Ward, P., Bartle, C., & Truman, W. (2010). "Killer crashes: fatal road traffic accidents in the UK." *Accident Analysis & Prevention*, 42(2), 764-770.

¹⁴ Glassbrenner, D. (2012). An analysis of recent improvements to vehicle safety (No. DOT HS 811 572).

Many government officials and citizens alike base their opinions of the MOT and other inspections on assumptions of added safety; however, much of the recent research examining these inspections has found that they have little—if any—impact. As early as 1999, the value of these inspections was questioned by a popular study by David Merrell, Marc Poitras, and Daniel Sutter, who found that safety inspections contributed little to the reduction of either road accident injuries or fatalities in the United States.¹⁵ The authors were the first to use data from across the United States, as well as to control for important state-specific omitted variables such as weather factors or road conditions. Using a simple regression model and these controls they revealed that vehicle safety inspections contributed little to road safety. Instead, policies which focused on reducing incidence of drinking and driving or increasing seat belt use could be much more effective.

A follow-up study by two of the authors (Daniel Sutter and Marc Poitras) published in 2002 went further, plumbing not only the effectiveness of safety inspections but also the reasons behind their continued existence.¹⁶ The authors concluded that while vehicle safety inspections contribute little in the way of actual safety increases, inspections such as the MOT persist because of the bureaucratic costs incurred by policymakers in both assembling current information about their effectiveness and engaging in discussions to dismantle unnecessary programs. Essentially, the costs entailed in shutting down a small (if wasteful) program such as inspection programs are perceived as too high for policymakers working unilaterally.

From the publication of these papers in 2002 until last year, no additional research examining the impact of tests like the MOT was conducted. However, as the rates and intensities of traffic accidents continued to decline, renewed interest in inspection programs led to their repeal across several regions of the United States (see Figure 2, below). Piecemeal repeals of this nature provide an ideal environment for researchers to test the effectiveness of the changing policy; hence, when Washington, D.C. and New Jersey did away with their inspections in 2009 and 2010 respectively, my co-author Trevor Woolley and I began to re-examine the usefulness of these dying programs.¹⁷ Our study, published in March, is the most recent to identify the causal effect mandatory safety inspections have on the rates of accidents and traffic fatalities due to car failure.

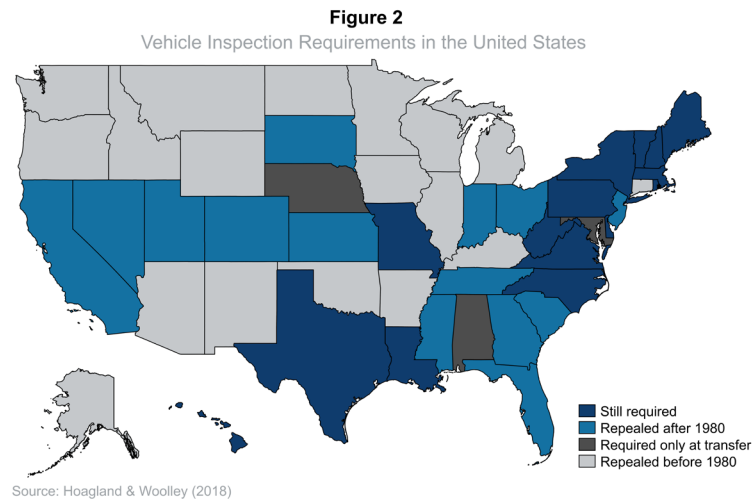
Both New Jersey and Washington D.C. chose to do away with their requirements due to increased public pressure to limit wasteful public spending on the programs. Specifically, claimed the then-New Jersey Motor Vehicles Commission Chief Administrator Raymond Martinez, “If we’re going to invest millions of taxpayer dollars year after year in a program, then it is essential that we be able to justify the

¹⁵ Merrell, D., Poitras, M., & Sutter, D. (1999). “The effectiveness of vehicle safety inspections: An analysis using panel data.” *Southern Economic Journal*, 571-583.

¹⁶ Poitras, M., & Sutter, D. (2002). “Policy ineffectiveness or offsetting behavior? An analysis of vehicle safety inspections.” *Southern Economic Journal*, 922-934.

¹⁷ Hoagland, A., & Woolley, T. (2018). *It’s No Accident: Evaluating the Effectiveness of Vehicle Safety Inspections*. Contemporary Economic Policy.

expense and effectiveness of the program.”¹⁸ Unable to do so given available data, both states scrapped the programs.

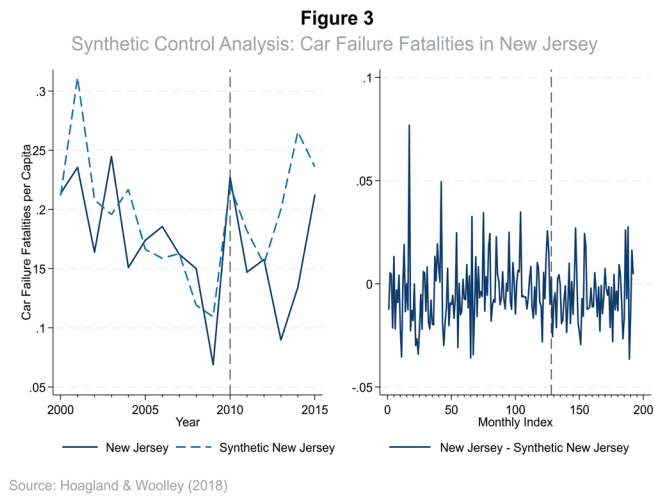


To draw out the effects of such policy changes, our study employs an increasingly popular technique from the toolkit of causal inference analysis known as the synthetic control method. This method examines the impact of a policy change in one region (known as the “treatment region”) as compared to a number of “control regions” in which the policy was not changed. By assigning weights to the different control regions based on certain observable characteristics, researchers can construct a synthetic version of the treatment region, equivalent to the treatment region in every observable way except in the policy change. Thus, differences in outcomes between the treatment region and the synthetic treatment region identify effects in a policy change. For example, our analysis combined traffic fatality data from Massachusetts, Rhode Island, and Virginia to construct our synthetic New Jersey, matching along geography, driver demographics and baseline accident types.

To apply the synthetic control method to mandatory safety inspections, we use New Jersey as the treatment region, as it ended its inspection program in 2010. Our control group was formed by other states in the US that still require inspections. We use the method to analyze three different outcomes of interest: the number of traffic fatalities overall, the number of fatalities due specifically to mechanical failure, and the fraction of accidents due to mechanical failure. Figure 3 shows an example of the synthetic control construction for the number of traffic fatalities due to mechanical failure. The first panel shows trends for both New Jersey (solid green) and its synthetic counterpart (dashed blue), while the second panel shows the differences between the two trends. In other words, the right-hand panel illustrates how much the repeal of inspections caused fatalities to vary from what they would have been had the program continued. Notice that differences are relatively small (with typical variation between the trends measuring less than 0.05 accidents

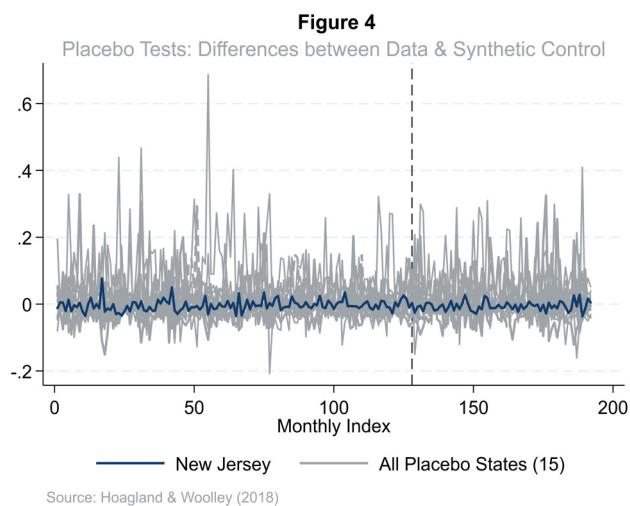
¹⁸ “N.J. will drop requirements for mechanical inspections of cars to save \$11M yearly”, nj.com, 17 July 2010.

per 100,000 people), and that they do not grow larger after the repeal of mandatory safety inspections (the dashed black line in both panels).



The graph above shows small differences between the treatment and synthetic New Jerseys, and no change in those differences after the inspection repeal. (If anything, the graph suggests that the repeal of the inspection program decreased accidents due to car failure slightly.) However, one remaining question that the method does not answer immediately is that of significance: how large these fluctuations are in relation to the rest of the available data. Significance in these types of analysis is determined through a series of placebo tests, in which we hypothetically impose a law change in a state where none actually occurred, measure its effect using real-world data, and compare to the measured effects from the actual law change.

Figure 4 shows the result of our placebo tests, again for the rate of traffic fatalities due to mechanical failure per 100,000 people. Each of the lines in gray represents the effects from hypothetically ending inspections in a different US state, while the blue line represents the estimated effects of the policy change in New Jersey. The fact that the blue line sits comfortably within the range of all of the gray lines indicates that the estimated treatment effects are too small to suggest any real effect of the policy change. This leads us to conclude that the repeal of mandatory inspections in New Jersey had little—if any—effect on the fatality rate, suggesting that the policy was overall, an ineffective one.



Using the synthetic control method allows researchers to separate correlations from causation, effectively enabling them to discuss the causal impacts of policy changes. Hence, the results from this study allow Hoagland and Woolley to conclude that annual safety inspections have no effect on reducing either the rate or severity of accidents due to car failure.

PROPOSALS FOR REFORM

In the last 20 years, almost no evidence has been presented documenting the positive impacts of programs such as the MOT; instead, these programs represent a significant amount of wasted time and money performing tests and unnecessary repairs, none of which makes roadways safer. Furthermore, the existence of these programs may lead drivers to engage in neglectful or reckless behaviors, as they know that their cars will be forced into better shape come the end of the year. Therefore, roadways can be improved by jointly relaxing the burdens placed on drivers and focusing attention on more pressing areas of vehicular safety. Some potential reforms to achieve these goals are:

- Separate the MOT into two distinct tests, one comprised of the typical vehicle safety inspection and another testing only carbon emissions. Emissions testing is valuable independent of safety inspections.
- Reduce the rate of vehicle safety inspections from annually to a less frequent interval (e.g., every 3 or 5 years).
- Increase the testable age of new vehicles from 3 years to 5 years (or more).
- Abolish vehicle safety inspections for all vehicles except vehicles older than 3 years entering the United Kingdom from abroad.
- Focus more resources on campaigns intended to reduce travelling without a seat belt, speeding, and/or substance abuse while driving.
- Dedicate additional resources to the development and testing of driverless vehicles to remove driver-related accident factors.

CONCLUSION

While there remains strong popular support for the MOT test from both policymakers and private citizens, nearly all recent evidence suggests that the test is ineffective at influencing road safety. As vehicle technology improves to make cars safer to drive, government policy should bring itself into the 21st century by striving to make drivers—not vehicles—safer and more reliable. Increased focus on distracted and unsafe driving practices will surely be more effective at reducing fatalities than any vehicular inspection program.

By continuing inspection programs like the MOT, the United Kingdom places an overly burdensome weight on its drivers to care for their vehicles while overlooking the more serious drivers of roadway fatalities and injuries: the drivers themselves. Even if the program cannot be abolished completely, the MOT program ought to—at a minimum—be seriously overhauled to be less restrictive and wasteful, and to focus on driver behavior rather than vehicle status.