



The 2015 ITIF Luddite Award Nominees: The Worst of the Year's Worst Innovation Killers

BY ROBERT D. ATKINSON | DECEMBER 2015

Neo-Luddites have wide-ranging targets, including everything from genetically modified organisms to new Internet apps, artificial intelligence, and even productivity itself.

Technological innovation is the wellspring of human progress, providing higher living standards, improved health, a cleaner environment, increased access to information and many other benefits. Yet despite all of these benefits, a growing array of interests—some economic, some ideological—now stand in stubborn opposition to innovation. Following in the footsteps of the infamous Ned Ludd, an Englishman who led a movement in the early 19th century to destroy mechanized looms, today's neo-Luddites likewise want to foil technological progress.

Neo-Luddites no longer wield sledgehammers, but they wield something much more powerful: bad ideas. For they work to convince policymakers and the public that innovation is the cause, not the solution to some of our biggest social and economic challenges, and therefore something to be thwarted. Indeed, the neo-Luddites have wide-ranging targets, including everything from genetically modified organisms to new Internet apps, artificial intelligence, and even productivity itself.¹ In short, they seek a world that is largely free of risk, innovation, or uncontrolled change.

The rise of neo-Luddism is not just an interesting social and political development. Rather, it undercuts one of the central challenges of our time: the need to rapidly raise living standards to ensure that all households earn high incomes. If society does not support risk-taking and the robust introduction of new technologies, then we will be consigned to stagnation. Fostering an environment in which innovation can thrive means rejecting “neo-Luddism.” Indeed, if we want a society in which innovation thrives, then replacing neo-Luddism with an attitude of risk-taking and faith in the future needs to be at the top of the

agenda. (You can take a test to determine how supportive you are of technological progress at www.DoYouLikeProgress.org.)

There are many bad ideas that, if followed, would slow human progress. But the purpose of ITIF's annual Luddite Award is to highlight the worst of the worst. For 2015, we present 10 nominees and invite readers to vote for the organization or individual they believe has done the most to smash the engines of innovation. In no particular order, this year's nominees are as follows:

1. Alarmists tout an artificial intelligence apocalypse.
2. Advocates seek a ban on "killer robots."
3. States limit automatic license plate readers.
4. Europe, China, and others choose taxi drivers over car-sharing passengers.
5. The paper industry opposes e-labeling.
6. California's governor vetoes RFID in driver's licenses.
7. Wyoming outlaws citizen science.
8. The Federal Communications Commission limits broadband innovation.
9. The Center for Food Safety fights genetically improved food.
10. Ohio and others ban red light cameras.

ITIF invites readers to vote for the worst of the worst by visiting www.itif.org/LudditeAward.

What is Luddism?

Luddism is not, as many people assume, a term for someone who is a late adopter of technology.² Rather, a Luddite is someone who seeks to hold back the introduction of new technologies.

There are two main wellsprings of Luddism. The first is what the original Luddite movement was grounded in: self-interested opposition to technological change. After all, the followers of Ned Ludd smashed textile machines not because they did not like technology and longed for a pastoral life, but to save their low-productivity jobs. Such interest-based Luddism is not declining. Indeed, as noted economist Joseph Schumpeter wrote, "the resistance which comes from interests threatened by an innovation in the productive process is not likely to die out as long as the capitalist order persists."³ In fact, as we make the transition to a tech-driven economy with a proliferation of new business models, opposition appears to be growing. Computer scientist Alan Kay, who famously said, "the best way to predict the future is to invent it," captured this new wave of opposition when he later quipped, "the best way to predict the future is to prevent it."⁴

The second source of Luddite opposition is ideological. In many ways, this is more powerful than interest-driven Luddism, for it cloaks itself in the mantle of the public good—as in, "We oppose robotics because we want to protect people's jobs from being automated." While the specifics of the claims may differ, behind all ideological Luddism is a general longing for the simpler life of yore—a life with fewer electronics, chemicals, machines, and the like.

There are two main wellsprings of Luddism: The first is self-interested opposition to technological change. The second is ideological. And a driver of both is fear.

A driver for both sources of neo-Luddism is fear. Individuals and organizations oppose genetically modified organisms, robots, and a host of other technologies because they believe that the harms the technologies create significantly outweigh the benefits. Neo-Luddites nearly always overstate the harms and risks, and understate the benefits. But there is more to the phenomenon than just an aversion to risk. Most neo-Luddites privilege the values related to potential harms (for example, seeing privacy as a fundamental human right rather than a right that competes with other values, such as freedom, prosperity, and even existence) while downplaying or even disparaging the benefits of progress (for example, dismissing the importance of productivity, in part by asserting, inaccurately, that it does not benefit average workers). With the scales tilted thus, it is much easier for the neo-Luddite vision to gain currency.

In short, Luddism is growing, and this is a problem not only because it reduces support for innovation, but because Luddites try to use the power of government to throw sand in the gears of progress or try to stop government from supporting progress, which slows technological innovation.

THE 2015 LUDDITE AWARD NOMINEES

Innovators face many challenges. Putting an idea into practice can be technically daunting, and securing the necessary funding can be a lethal hurdle. Good government policies can foster innovation, but bad policies can erect insurmountable barriers to innovation and progress. From a rich slate of ill-considered anti-innovation policies around the world in 2015, ITIF has selected 10 that richly deserve opprobrium, presented in no particular order.

1. Alarmists Tout an Artificial Intelligence Apocalypse

In the last year, a number of prominent scientists and well-known luminaries, such as Stephen Hawking, Bill Gates, and Elon Musk, have warned that in the not-so-distant future, humans could lose control of artificial intelligence (AI), thus creating an existential threat.⁵ Paranoia about evil machines has swirled around in popular culture for more than 200 years, and these claims continue to grip the popular imagination, in no small part because these apocalyptic ideas are widely represented in books, movies, and music.⁶ The last year alone saw blockbuster films with a parade of digital villains, such as *Avengers: Age of Ultron*, *Ex Machina*, and *Terminator: Genisys*.

In his book *Superintelligence: Paths, Dangers, Strategies*, Oxford professor Nick Bostrom reflected the general fear that “superintelligence” in machines could outperform “the best human minds in every field, including scientific creativity, general wisdom and social skills.”⁷ He argues that artificial intelligence will advance to a point where its goals are no longer compatible with that of humans and, as a result, superintelligent machines will seek to enslave or exterminate us.

Most of us are rightly amazed at AI applications like IBM’s Watson, our Nest thermostat that learns, and other learning devices. But to say that these devices and systems will be smart enough to take over the world is to misunderstand what AI is and where it stands today. Whether such systems will ever develop full autonomy is a debatable question, but

what should not be debatable is that this possible future is a long, long way off (more like a century than a decade), and it is therefore premature to be worrying about “Skynet” becoming self-aware.

Raising such sci-fi doomsday scenarios just makes it harder for the public, policymakers, and scientists to support more funding for AI research. Indeed, continuing the negative campaign against artificial intelligence could potentially dry up funding for AI research, other than money for how to control, rather than enable AI. What legislator wants to be known as “the godfather of the technology that destroyed the human race”? (On the other hand, if we are all dead, then one’s reputation is the last of one’s worries.)

This matters, because artificial intelligence and machine learning promise enormous benefits to society. Already, AI is the secret sauce in the self-driving cars that Google and Tesla are testing, and it is in our smartphones, powering services such as Siri, Google Now, Alexa, and Cortana, which interpret our speech to provide us with timely answers to practical questions. Search engines like Google use artificial intelligence to generate search results and to translate languages in real time. And Watson is helping improve medical diagnoses. These are only the beginning if we don’t give in to Luddite-induced paranoia.

2. Advocates Seek a Ban on “Killer Robots”

As part of the paranoia over artificial intelligence, efforts to establish a global ban on offensive autonomous weapons—also known as “killer robots”—have intensified.⁸ This increased activity comes on the heels of an open letter in which a group of AI and robotics researchers, including luminaries such as Stephen Hawking and Noam Chomsky, called for such a ban.⁹

These efforts actually started in 2012, when several organizations came together to form the Campaign to Stop Killer Robots, a coalition seeking to “preemptively ban fully autonomous weapons.”¹⁰ But it gathered steam this year when the United Nations hosted its second meeting to consider a formal ban or other restrictions on the technology.¹¹ The principal argument that AI detractors make is that nothing short of a complete ban would stop an eventual arms race that would result in autonomous weapons becoming available to everyone from drug kingpins to rogue nations. They also argue that allowing autonomous robots to make life-and-death decisions “crosses a fundamental moral line” that would result in a lack of accountability for civilian deaths, and that these decisions are too ethically complex to delegate to machines.¹²

But that overlooks the fact that the military clearly will benefit, because substituting robots for soldiers on the battlefield will increase a military’s capabilities while substantially decreasing the risk to its personnel. Furthermore, it is possible that autonomous weapons could be programmed to engage only known enemy combatants, which may even lead to a reduction in civilian casualties.

Moreover, military research and investment has long been a key catalyst to developing and commercializing new technologies with important commercial uses, and robotics will likely prove no different.¹³ For example, the robot used to transport injured soldiers on the

battlefield can also be used to lift and move patients in hospitals, thereby addressing one of the leading causes of workplace injuries among nurses.¹⁴

Unfortunately, the efforts to ban autonomous weapons could very well reduce funding and support for robotics research that would have significant positive spillovers for other kinds of robotics use that would in turn increase economic productivity and quality of life over the next half-century. With autonomous robots, factories will be able to increase productivity and better compete with low-cost competitors, mines will be able to improve safety, and hospitals will be able to provide better care to patients. Substituting robots for human workers will lead to higher productivity, lower costs, higher wages, more capabilities, and more service availability, all without reducing the total number of jobs as demand expands across the economy in response to increasing supply.¹⁵ Indeed, robotics could very well be the most important technology of the 21st century.

As such, the battle to ban autonomous weapons, much like the fight over artificial intelligence, works against the societal goal of building innovations that will improve human lives. Rather than allowing those predicting doom and gloom to dominate the debate, policymakers should encourage military investment in autonomous robots, not only to improve national defense, but also to accelerate the development of autonomous robots for other sectors.

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3. States Limit Automatic License Plate Readers

In 2015, a number of states have taken steps to limit the use of automatic license plate recognition (ALPR) technology, even though it has increased the efficiency and effectiveness of law enforcement in many states. This technology can be deployed on patrol cars or fastened to bridges, traffic lights, and overpasses to rapidly scan thousands of license plate numbers on moving or stationary vehicles and compare them to federal and state criminal databases. ALPR technology collects images of license plates, deciphers them, and logs the date, time, and location where the image was captured. This information alone does not identify an individual. If vehicle owners have not been charged with a crime, then law enforcement cannot identify them without looking them up in the Department of Motor Vehicles' database.¹⁶

In one sense, ALPR is functionally no different than state and local governments hiring significantly larger numbers of police officers to manually look for license plates of cars suspected of being involved in a crime. Indeed, without ALPR, law enforcement could still look up license plates, just much slower and at greater cost to taxpayers.

Yet some civil liberties groups have raised concerns about ALPR technology. The American Civil Liberties Union, for example, calls it a "surveillance technology" and worries that "you are being tracked."¹⁷ A group calling itself "PrivacySOS" warns that "the APLR surveillance net is already woven tight in some areas."¹⁸

With such groups mischaracterizing ALPR and minimizing its benefits, it is not surprising that a number of states have taken steps to stop or significantly limit the technology.¹⁹ For example, Montana legislators introduced a bill that would have prohibited government use of license plate scanners.²⁰ The Massachusetts legislature introduced a bill that would

require police to delete any image the devices capture after 14 days.²¹ Vermont went even further, passing a law that restricted data retained by ALPR systems to only 24 hours.²²

These proposals will reduce the use of ALPR for solving crimes. Law enforcement uses the technology to check unidentified license plate information against federal and state “hotlists” of vehicles that have been involved in crimes, and the owners’ identity is only revealed if there is a match. For example, law enforcement uses ALPR to quickly compare each license plate captured to the FBI’s National Criminal Information Center, which only stores license plate information associated with suspects in open investigations that involve crimes such as kidnapping, child trafficking, murder, terrorism, and missing persons.²³ When ALPR flags license plates that match NCIC data, law enforcement can quickly identify new investigative leads and catch wanted criminals. Of course, law enforcement can do this now manually, but the process is much more costly and less effective.

ALPR technology has clear benefits in enabling society to apprehend criminals. For example, within the first 30 days of access to a national license plate data network, the Sheriff’s Department of Sacramento County found 500 stolen or carjacked vehicles, and 19 other felony vehicles.²⁴ One suspect kidnapped a girl in New York and took her to Maryland, where ALPR data allowed investigators to capture the suspect and rescue the victim.²⁵ In another well-known case, Virginia state police used ALPR technology to catch a shooter who was wanted for murdering a TV reporter and cameraman during a live news report.²⁶

Of course, there should be rules governing how ALPR is used. But many of the rules that have been proposed would unnecessarily limit law enforcement’s access to ALPR information. For example, an aggressive retention limit on ALPR data could prevent law enforcement from solving “cold” cases—unsolved criminal investigations that remain open pending the discovery of new evidence—and limit the collection of unpaid parking ticket revenues.²⁷ Rather than seek to ban or hinder law enforcement’s access to ALPR data, states should embrace sensible rules that allow the technology to benefit society without threatening civil liberties, such as by instituting audit processes to ensure ALPR data is used for law enforcement purposes and reporting requirements. For example, in 2014 Maryland passed legislation that preserves many of the benefits of ALPR technology while also increasing access controls and data security.²⁸ Maryland’s law created auditing controls and transparency requirements, under which law enforcement must report annually how they use ALPR data, ensuring proper management and oversight of these systems. This law also established that ALPR data cannot be subject to disclosure under public records requests, helping keep citizen data protected.

4. Europe, China, and Others Choose Taxi Drivers Over Car-Share Passengers

In the last year, several European countries and the Chinese central government, among others, have decided they do not want consumers to have unfettered access to new Internet-based ride-matching platforms. These sharing economy–based, alternatives to taxi services come with many benefits. They allow users to call cars to their location and use convenient payment methods that reduce the hassle of finding and paying for traditional

taxis. And they are usually cheaper than conventional taxis, because the platforms are more efficient in matching drivers and customers.

Unfortunately for European and Chinese consumers, incumbent taxi industries have launched efforts to persuade regulators to restrict this technology-enabled competition. And some European and Chinese regulators have obliged by erecting barriers to market entry, asserting that the new breed of sharing-economy competitors do not comply with the same regulations as their taxi counterparts. The rash of barriers to ridesharing services started in Germany in late 2014, when a court slapped a temporary nationwide ban on one of Uber's services, UberPOP, because drivers on the service lack the professional licenses that German law requires.²⁹ A consortium of taxi operators in Germany called Taxi Deutschland originally brought the case against Uber, and it has continued to push against Uber's expansion.³⁰ In March 2015, a German court upheld a temporary, nationwide injunction, which still persists today.³¹

By standing in the way of ridesharing applications, countries are slowing the pace of innovation in the sharing economy.

Many countries soon followed suit. In December 2014, the Netherlands banned UberPOP because its drivers do not have taxi licenses and threatened to impose fines of €10,000 (\$12,300) for each offense.³² Spain also banned the ride-sharing service, going so far as to prohibit payment companies from working with Uber and forcing telecom companies to block access to the app.³³ And in September 2015, a Belgian court confirmed a ban on UberPOP, giving the company three weeks to close operations or risk penalties.³⁴

In France, Uber has faced a prolonged battle over its operations. Initially, a Paris judge declined to block Uber's services.³⁵ However, French authorities decided differently, banning UberPOP services and arresting Uber France's executives in January 2015 for running an illegal taxi operation.³⁶ Uber's legal appeals worked their way through the French court system until the country's highest court upheld the ban on Uber's low-cost service in September.³⁷

China began erecting barriers to Internet-based ride-matching platforms in January 2015, when Liang Jiangwei, the director of Beijing's traffic enforcement unit, said the use of unlicensed taxis by Internet hailing apps violated a ban on illegal taxis.³⁸ As a result, Uber has faced crackdowns in multiple cities, such as Chengdu and Guangzhou, where local authorities have raided Uber's offices because it does not have "legal status."³⁹ In October, the Chinese government announced draft regulations that would force ridesharing apps to operate like traditional taxi dispatchers. If passed, these regulations would significantly alter the ridesharing business model.⁴⁰ For example, the draft regulations would force ridesharing companies to store their servers in China, register their businesses as taxi companies and their vehicles as taxis, and limit participation in the service to drivers with three years of experience driving a taxi.

By standing in the way of ridesharing applications, these countries are slowing the pace of innovation in the sharing economy. These countries should recognize that ridesharing systems often mimic the consumer protections that traditionally required a government arbitrator. For example, Uber's and Lyft's user-rating systems allow users and drivers alike to rate each other, which helps self-regulate the system and weed out bad actors, all while promoting consumer well-being.

Companies like Uber and Lyft also act as the middleman between the user and the driver, issuing background checks, checking insurance, and preventing bad drivers from using its application. These efforts resemble the protections enabled by Germany's and France's original taxi cab requirements. For example, in order to get a *Personenbeförderungsschein* (a German taxi license), an applicant must have a valid driver's license, a medical exam, and a police background check.⁴¹ Before banning rideshare services for violating the letter of the law, countries should assess whether a company's practices meet existing safety requirements in spirit and work with the companies to mitigate any additional harms.

5. The Paper Industry Opposes E-Labeling

In late 2014, the Food and Drug Administration (FDA) started a rulemaking process to amend prescription drug labeling regulations so that drug safety disclaimers can be made available electronically rather than in paper form.⁴² Unfortunately, this simple and sensible update to the FDA's rules was opposed by the paper industry.

Industry trade associations such as the American Forest and Paper Association, along with allied single-issue advocacy groups like Consumers for Paper Options and the Pharmaceutical Printed Literature Association (PPLA), opposed the rulemaking because it would reduce the pharmaceutical companies' demand for paper or printing services.⁴³ For example, when the FDA pushed for e-labeling in 2014, the Senate Appropriations Committee, which had been lobbied by advocacy organizations such as the PPLA, directed the FDA to ensure "any proposed regulation regarding electronic inserts of drug labeling does not come in lieu of paper inserts."⁴⁴

The PPLA claims paper labels are better because some people do not have access to the Internet, so they cannot use e-labels, and national disasters can more easily disrupt access to e-labels than paper ones.⁴⁵ However, prescribing information is mainly used by healthcare providers and pharmacists, which already use electronic sources for prescription information. For example, only 6 percent of pharmacists exclusively use paper resources to receive prescribing information and only 4 percent do not have access to the Internet.⁴⁶ To cover the small number of providers that need a paper option, the FDA's rulemaking proposed that drug manufacturers maintain a 24/7 toll-free telephone number allowing pharmacists to request faxes or mailings of prescribing information. Furthermore, the argument that electronic storage is especially susceptible in times of a natural disaster is specious. While storms and fires can destroy paper copies, digital copies remain usable well after a disaster.

Furthermore, the paper industry's arguments fail to consider the benefits that e-labeling offers government, industry, and consumers. First, e-labeling cuts costs. The FDA estimated that this rule change would save between \$52 million and \$164 million over 10 years, predominately in the healthcare industry.⁴⁷ Or to put it another way, the rule change would reduce the revenue of the paper industry by nearly as much. In addition, e-labeling would make information more timely and accessible. When a drug manufacturer updates the paper prescribing information of a specific drug (e.g., information regarding dosage, use, and side effects), there is often a delay in dispensing revised prescription information, because the manufacturer must print and ship new labels. However, e-labeling would allow

manufacturers to update this information instantaneously, giving healthcare providers a level of accuracy that wasteful paper labels cannot achieve. Because certain medicines can be fatal if taken incorrectly, timely updates can save lives. Policymakers should be wary of arguments that benefit the incumbent paper industry at the expense of progress; they should instead push to bring prescription drug labels into the 21st century.

6. California's Governor Vetoes RFID Tags in Driver's Licenses

In October, citing privacy concerns, California Governor Jerry Brown vetoed a bill that would have allowed California drivers to voluntarily choose to get a state driver's license with radio frequency identification (RFID) tags—sensors that use electromagnetic waves to automatically identify objects.⁴⁸ The purpose of the legislation was to help speed up border crossings between California and Mexico by meeting federal identification standards applied by the Department of Homeland Security.⁴⁹

Privacy advocates have long demonized RFID technology by invoking the specter of “spy chips.”⁵⁰ For example, when the International Civil Aviation Organisation (ICAO) outlined plans in 2004 to standardize the use of RFID technology in all government-issued passports, 39 civil liberties groups sent a letter to the organization opposing the plan and claiming it would lead to a “global infrastructure of surveillance.”⁵¹ It was noteworthy that when the United States adopted the ICAO's standards in 2006 and began equipping all new passports with RFID tags there were no reported privacy or civil liberty problems.⁵²

Yet when California lawmakers tried in 2013 to bring their state's licenses into the 21st century by incorporating RFID tags, privacy advocates once again raised the alarm that the government would use the technology to track individuals, or that identification cards would be stolen and the data on them copied.⁵³ More recently, the American Civil Liberties Union produced a panoply of claims to whip up resistance, including that the use of RFID would reduce the privacy and security of Californians' information and open the door to racial profiling.⁵⁴ The group warned that had the bill passed, criminal records would have been linked to driver's licenses, allowing police officers to know someone's race, citizenship, and criminal history before they meet the person. Similarly, the ACLU claimed that RFID chips were not secure, citing an instance where a security researcher built an RFID reader and drove around San Francisco, using it to easily read and copy the information on RFID chips without the owners' knowledge.⁵⁵

These claims, like so many that privacy advocates use to gin up “privacy panics,” are fanciful and speculative. We don't need new technology to do much of what they rightly oppose, like racial profiling or tracking. Governments can do these things without new technology—and democratically elected lawmakers, the courts, the media, and citizens can and should work to ensure that governments do not abuse our rights. Moreover, these privacy groups fail to point out that RFID chips on driver's licenses do not contain or store personally identifying information; they merely store a unique number that links a motorist to a Department of Homeland Security database. A person with an RFID reader would also need access to the database to get any personal information. Policymakers should embrace rather than oppose these RFID technologies for drivers' licenses.

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7. Wyoming Outlaws Citizen Science

Citizen scientists—members of the public who donate their time and talents to collect and analyze data for the government—constitute a valuable resource for agencies that have limited ability to carry out scientific research due to technical or budgetary constraints.⁵⁶ So when the Wyoming chapter of the nonprofit conservation organization Western Watersheds Project (WWP) collected water samples from streams crossing federal lands and found *E. coli* bacteria present at 200 times the legal limit defined by the Clean Water Act, the Wyoming Department of Environmental Quality (DEQ) was able to use this data to subject these waterways to greater regulatory scrutiny.⁵⁷

The source of this hazardous contamination? Ranchers letting their cows graze and defecate near these waterways.⁵⁸ In 2014, 15 of these ranchers sued WWP, claiming the organization must have trespassed on their private lands to collect this data, despite WWP maintaining no wrongdoing.⁵⁹ The suit is still ongoing, but rather than investigate how to reduce the amount of potentially life-threatening bacteria in the state's waters, the Wyoming state legislature instead passed two statutes in 2015 that make it a crime for the public to collect “resource data”—data relating to land or land use, ranging from geology, to archeology, to air quality—if they intend to share this data with a government entity.⁶⁰ Wyoming passed these statutes ostensibly to strengthen private landowners' protections against unlawful trespassing, but their wording actually prohibits the collection of resource data on any land, even if the land in question is public, which effectively criminalizes citizen science.⁶¹ Should a member of the public collect this data, which could entail something as innocuous as photographing the natural landscape, and share it with a government entity, the citizen could face up to a year in prison and a fine of up to \$1,000.⁶²

Specifically, the statutes make it unlawful for a person to enter onto “open land” for the purpose of collecting resource data, which is defined as “...land outside the exterior boundaries of any incorporated city, town, subdivision ... or development,” without explicit permission to collect specific data.⁶³ The fact that this definition is broad enough to include public lands is no accident. An early draft of one of the statutes only prohibited such activities if a person “enters onto or crosses private open land,” but the bill was later amended to replace this with the broader language.⁶⁴ Since the term “private open land” is used elsewhere in the final versions of the statutes, it is clear that Wyoming lawmakers acted deliberately to prohibit collection of any kind of resource data throughout the state.⁶⁵

If the state wants to shield polluters from regulatory scrutiny, then it should repeal or weaken state environmental laws, not criminalize data collection.⁶⁶ By doing so, Wyoming's state legislature has substantially limited the potential for beneficial and even life-saving applications of data. Under Wyoming's new laws, even if a person were to observe a pressing hazard to public health, such as illegal dumping of hazardous waste, the person legally could not collect and report evidence of this to a public authority. Ironically, prohibiting such activity could actually do more harm to ranchers than answering to environmental regulators ever could, as the data that citizen scientists collect offers economic and social benefits well beyond just spurring regulatory action. The federal government has repeatedly used data from citizen scientists to carry out projects that directly benefit ranchers, ranging from developing early warning systems for animal disease

outbreaks to more accurately measuring soil moisture levels, which can have a substantial impact on agricultural productivity and guide efforts to prevent wildfires.⁶⁷ The next time a disease ravages a herd of cows or a wildfire razes a pasture, ranchers should thank the Wyoming legislature for criminalizing the collection of data that could help prevent such disasters.

8. The FCC Limits Broadband Network Innovation

The Internet in general and broadband networks in particular are continually improving through innovation. But in an effort to freeze network innovation, the Federal Communications Commission, at the urging of a wide range of neo-Luddite organizations, enacted regulations to protect “net neutrality,” a rather nebulous concept, generally standing for the principle that broadband networks should treat all data packets alike, even if they have different network needs. This will significantly constrain network innovation.

In April 2014, Tom Wheeler, chairman of the Federal Communications Commission (FCC), blogged to “set the record straight” about his plans for net neutrality regulations.⁶⁸ He defended the open Internet rules he was proposing at the time, which would have kept broadband designated as a lightly regulated information service under section 706 of the Communications Act, thereby protecting the Internet from abuses while also allowing broadband providers to innovate. Chairman Wheeler explained how, contrary to many “incorrect accounts” and “a great deal of misinformation” from neutrality advocates and the press, his proposal would have put open Internet rules in place to prevent blocking or degrading of broadband traffic, or any practices that would harm consumers, competition, or innovation. What’s more, Chairman Wheeler’s section 706 proposal would have protected the open Internet under a stable and predictable regulatory framework that would have enabled much-needed flexibility for broadband providers to offer different levels of service for applications that needed traffic differentiation (such as video telephony).⁶⁹

Fast forward 10 months to February 2015, and that “great deal of misinformation” had won the day. The FCC folded in the face of popular and political pressure as it reinforced the Manichean narrative of an Internet in need of “saving” by opting for the blunt, expedient tool of Title II over the balance and precision of its original section 706 proposal. Title II, with basic elements designed in the 1930s, represents a step backward in time in reaction to largely overblown, hypothetical, neo-Luddite fears.

The anti-innovation “strong” net neutrality movement has real consequences for dampening innovation. To take just one example, venture-based GreenByte, a high-tech startup from a Princeton University computer science professor, which would have allowed variable data pricing on smart phones, went out of business because net neutrality absolutists made it so difficult to sell the company’s solution.⁷⁰ Locking in today’s Internet will consign us to a less vibrant Internet in years to come.

The Internet is still young, requiring substantial amounts of innovation—both in the applications that run on it and in the heart of the network itself—in order to become a true poly-service platform that can support a multiplicity of dynamic services. Especially needed

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are better tools to manage networks and optimize performance for latency-sensitive applications such as two-way video communications, augmented reality, or connected cars. Title II-style net neutrality attempts to lock down the current Internet architecture, largely in the vain hope of controlling the future of video competition, with little regard for unintended consequences. Forward looking, it cannot serve as a flexible framework to protect consumers, competition, and innovation. Chairman Wheeler's section 706 proposal would have been a better way to enable innovation, both in the network and in the applications we use.

9. The Center for Food Safety Fights Genetically Improved Food

Biotechnology is playing an increasing role delivering innovations in agriculture that the world desperately needs to meet rising demands for food, feed, and fiber, as the world's population continues to grow. The most comprehensive meta-analysis to date shows biotech innovations in crop improvement have increased agricultural yields on average by 22 percent, reduced pesticide use by 37 percent, and increased farmer income by 68 percent. Improvements in animal husbandry have lagged, however, despite numerous needs and opportunities. That changed this year when the U.S. Food and Drug Administration (FDA) approved the sale of fast-growing AquAdvantage bioengineered salmon. In their ongoing attempt to ban all genetically improved foods, an organization called Center for Food Safety announced plans to sue the FDA to block the approval.

The salmon represents a real innovation that will improve people's health while reducing the price of food. It has been improved to reach market size in half the usual time (16-18 months, rather than the usual 32-36) on 20 percent less feed, meaning that for the first time salmon could be a low-cost substitute for meat in American diets. The salmon is intended to be grown in concrete tanks in warehouses close to major markets, like Chicago. The fish are sterile, so they cannot breed with wild salmon in the unlikely event they escape from their concrete tanks and get to an open ocean. They also have been designed to eliminate the potential downsides sometimes associated with conventionally farmed Atlantic salmon, which have been observed to escape from their sea pens and carry parasites or diseases into wild populations.

The FDA took more than a decade to review data on the salmon to ensure it would be safe for humans to eat. At the end of an exhaustive review process that examined thousands of pages of data and scientific literature, the FDA concluded the AquAdvantage salmon is, in all respects relevant to health, safety, and nutrition, indistinguishable from any other Atlantic salmon. Thus it is safe for consumers to eat and requires no special labels. These findings elicited an entirely predictable response from the neo-Luddite enemies of innovation.

The "Center for Food Safety" has only one scientist on staff, but a large group of lawyers. With little or no expertise in food safety, their lawyers nonetheless have demonstrated experience in promoting fear. Their *raison d'être* is to use misleading claims, lawsuits, and other harassment to oppose agricultural innovation and keep the world safe for Victorian farming methods. Besides opposing more affordable and healthier salmon, the Center for Food Safety also has pushed to stigmatize foods derived through biotech improvements by

labeling them even when exhaustive research concludes there is no health, safety, or nutritional information to convey to the public. CFS founder Andrew Kimbrell has been particularly candid in acknowledging that the intent behind the drive to label “GM” foods is to rally public opposition, despite the fact that the global scientific consensus in favor of genetically improved foods is even stronger than it is on anthropogenic climate change.⁷¹

10. Ohio and Others Limit Red Light Cameras

Red light cameras capture images of cars when they cross intersections illegally. Authorities can then use these images as evidence to enforce traffic laws and issue fines. Indeed, the major reason drivers run red lights is because they rightly judge that the risk of getting caught is low. When cities install red light cameras, they increase the odds of catching violations, and drivers respond accordingly.

In 2008, there were more than 2.3 million intersection-related crashes, resulting in more than 7,770 fatalities and approximately 733,000 injuries, according to the National Highway Traffic Safety Administration (NHTSA).⁷² There is overwhelming evidence that red light cameras are an effective means of preventing these crash-related injuries and deaths. For example, the Texas Transportation Institute found that when red light cameras were installed there was a 5 percent reduction in red light-related crashes, and right angle crashes dropped by 32 percent.⁷³

However, according to the Insurance Institute for Highway Safety, the number of U.S. communities using red-light cameras has fallen 13 percent since the end of 2012.⁷⁴ In fact, populist opposition has led approximately 70 communities across the country to ban the cameras, including the state of Arizona, New York’s Nassau County, and 24 communities in New Jersey, among others. Most recently, the state of Ohio effectively banned red light cameras by requiring an officer to be present at camera locations to personally witness a violation before a ticket can be given.

Opponents are unmoved by the obvious safety and efficiency benefits of red light cameras, which not only reduce accidents but also allow police officers to focus on more important public safety issues. Opponents instead rally people to their cause by focusing on the public’s general dislike of traffic citations and fear of “Big Brother.” John Bowman, the communications director for the National Motorists Association, argues that policies allowing speed cameras for traffic enforcement “seriously infringe on the rights of the driving public, harm the economies of communities that adopt it, and shift the emphasis of traffic enforcement from safety to a for-profit enterprise driven by ticket quotas.”⁷⁵ Never mind that the driving public clearly has no right to run red lights.

While these technologies can theoretically result in government overreach (as virtually any technology can), the focus should be on reducing overreach, not on eliminating life-saving technology. For example, the Governors Higher Safety Association argues that “cameras should not be used as a revenue generator. Compensation paid for an automated traffic law system should be based on its value and not on the amount of revenue it generates nor the number of tickets issued. Revenues derived from the automated enforcement program should be used solely to fund highway safety functions.”⁷⁶ If Ohio legislators are worried

about abuse, then rather than effectively banning life-saving red light cameras, they should instead simply regulate how the cameras are used.

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ACKNOWLEDGMENTS

The author wishes to thank Daniel Castro, Stephen Ezell, Doug Brake, Val Giddings, and Alan McQuinn for providing input to this report. Any errors or omissions are the author's alone.

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