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1

Introduction

> Ours is a progressively technical civilization [. . .] It is a civilization committed to the quest for continuously improved means to carelessly examined ends.
>
> ROBERT K. MERTON[1]

In 2018, a column in *Land Line*, a popular trade magazine for truck drivers, posed a hypothetical question: "What if the Transformers had ELDs?"[2] "ELDs" here refers to *electronic logging devices*: digital systems that capture data about truckers' activities, particularly their work hours, intended to keep them from driving for more time than federal regulations allow. When truckers meet the time limits, they are supposed to stop and rest—sometimes for as long as thirty-four hours—before they can legally drive again.

The columnist, Tyson Fisher, imagines a satirical Michael Bay screenplay in which a squad of Transformers is being summoned by the President himself to prevent a team of Decepticons from infiltrating Earth. Despite the urgency and horror of the situation, the Transformers must sheepishly inform the President that the team cannot help. An excerpt:

> *Optimus Prime and the other Autobots look around the room at each other in panic. A sense of helplessness is felt, heard, and seen throughout the control room.*
>
> OPTIMUS PRIME: Ummmmm . . . Mr. President, we're past our hours of service. We physically can't move.

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FIGURE 1.1. A cartoon imagining the Transformers constrained by electronic monitoring. Credit: Mo Paul and *Land Line* Magazine.

PRESIDENT (in utter shock): What the hell do you mean??? We're all going to die!

OPTIMUS PRIME: It's been over a year since we were needed. Since then, Congress passed the ELD mandate. We begged for an exemption but never got it [. . .]. There's no wiggle room here. We're paralyzed for another 10 hours.

PRESIDENT: Mother of God. What have we done?!?! [3]

The screenplay does not have a happy ending: the Decepticons destroy the planet and the entire human population, while the Transformers—hamstrung by digital monitoring and shortsighted regulations—stand by, unable to save the day.

In December 2017, about six months before the *Land Line* column was published, the federal government had implemented a requirement that all truckers buy, install, and use electronic logging devices—the "ELD mandate" to which the column refers. These devices are intended to address one

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of the most important and pervasive problems in trucking: fatigue. Truckers are notoriously overworked and underslept, a problem that can have deadly consequences. For decades, truckers have been subject to federal "hours-of-service" regulations that limit the number of hours they can drive each day and each week before taking long breaks. These rules have been in place since the 1930s—and have been enforced, until recently, by requiring truckers to keep track of their hours using paper-and-pencil logbooks, which are subject to inspection by law enforcement at roadside or at weigh stations. But because truckers are economically incentivized to drive for as long as possible, owing in large part to the fact that they are paid by miles driven, it's an open secret in the industry that paper logs are frequently falsified—so much so that classic trucker anthems even make allusions to these regulatory "swindle sheets."

The federal government's solution to the fatigue problem has not been to restructure trucker pay to reduce truckers' incentives to overwork. Rather, it has turned to digital monitoring. ELDs create a digital record of truckers' activities and are intended to be more "tamperproof" and less falsifiable than paper logs (though, as we shall see, they are not completely so). And crucially, these devices facilitate surveillance not only by the government, but also by trucking *firms*—serving as a technological backbone that scaffolds a great deal of real-time data collection about truckers' bodies and behaviors, and fundamentally changing the nature of the trucking workplace.

Though obviously tongue-in-cheek, the *Land Line* Transformers column reflects what many truckers saw as the utter shortsightedness and disrespect of the ELD mandate: they are strong, vigorous, essential workers on whom a great deal (perhaps the fate of humanity!) depends. Yet in their view, they are being hemmed in by a ridiculous device that prevents them from doing their jobs—and we will all pay for it in the long run.[4]

This book examines how truckers' work is being affected by this proliferation of surveillance technologies. These technologies are part of an emerging regime of *digital enforcement*—the use of technology to enforce rules, both legal regulations and organizational directives, more "perfectly" than might otherwise be possible. In trucking, digital enforcement confronts the existing social order of the industry: it upends the occupational autonomy truckers have traditionally held, reconfigures information flows within trucking firms, alters how truckers and law enforcement officers interact with one another, and creates new sites of contestation and resistance. The economic realities of trucking have long depended on truckers' discretion, including flexible recordkeeping routines and the ability to direct their own work

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in the face of unpredictable and often inhospitable conditions. But digital enforcement doesn't address these realities; it papers over them. In this book, I examine the social consequences of this approach.

Are Rules Made to Be Broken?

The rationale behind the ELD mandate is that "electronic logs take the non-compliance issues off the table" (as one trucking executive put it),[5] making it much less feasible for truckers to break the hours-of-service rules. We might, of course, accept this goal as normatively desirable and relatively uncontroversial. If we have rules in place for safety reasons, at which we have arrived through legitimate political processes, and those rules are easily broken, why *shouldn't* we enforce them more consistently if we can do so? Aren't rules rules?

In fact, it's not so simple—rules *aren't* always rules. Rules are shaped by social, cultural, and economic realities, and are almost never as simple as they might seem on paper. As an intuitive example, consider how you'd feel if you were ticketed by a police officer for driving sixty-six miles per hour when the speed limit is sixty-five. Officially, you've broken the rule—but the violation is so trivial, and the rule is so commonly broken, that to-the-letter enforcement would very likely strike us as unfair and unreasonable. (Further proving the point, the policing of minor speed violations is often merely a "pretext"—that is, a disingenuous excuse—for police to stop and investigate drivers, particularly Black drivers, for other reasons.[6])

But there's an even more important point here. It's not just that some amount of rule-breaking, like the behavior of our barely speeding driver, is considered unobjectionable. The more fundamental point is that we often *depend* on rule-breaking to make the world function. When former New York City Mayor Bill de Blasio proposed a zero-tolerance policy for jaywalking, economists were quick to point out that if anti-jaywalking rules were followed to the letter, pedestrian commute times would increase, and the city's social and economic life would suffer for it.[7] We rely on this sort of routine rule-breaking to make society function efficiently. Perhaps no phenomenon illustrates the point more clearly than the "work-to-rule" labor action, in which unions exert pressure on management by following every rule in the handbook to the letter. Doing so slows organizational functions to a halt—but because employees are *officially* following the rules, it is difficult to discipline them. The fact that working to rule functions as a resistance tactic demonstrates by implication that most of the time, work practices

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do not fully accord with the rules—indeed, organizations rely on the fact that they don't.[8]

Examples abound—particularly in the workplace. Organizational theorists have long observed that firms, in response to pressures for institutional conformity, often adopt certain formal rules and structures to achieve legitimacy, while decoupling those rules from practices that allow them to function efficiently.[9] Alvin Gouldner's seminal 1954 ethnography of a gypsum mine describes workplace rules that were in neither managers' nor workers' interests to enforce.[10] These rules were enforced only on rare occasions—for instance, a smoking ban was enforced only when insurance inspectors came by—while most of the time managers "looked the other way" at employee rule-breaking. This "mock bureaucracy" effectively gave supervisors a bargaining chip they used to maintain friendly relationships with workers. More recently, Michel Anteby described similar practices in an aeronautical factory, where managers tolerated and even encouraged employees making small souvenirs, called "homers," for new retirees, using company time and materials.[11] Though homer-making was officially forbidden, the fact that this rule was so often broken served a similar function as Gouldner's smoking ban: managers could ultimately exert more control over workers by seeming to be "on their side" when it came to rule-breaking, and workers viewed the practice as a source of pride and occupational identity.

To be sure, nonenforcement of rules, in the workplace or more generally, isn't necessarily a good thing. Many rules are in place for a good reason—to protect workers and others in vulnerable positions, or as a check on the powerful. Selective enforcement of laws can be the basis of arbitrary or discriminatory treatment. And we may or may not think that the managers in Gouldner's gypsum mine and Anteby's aeronautical plant were ultimately doing workers any favors when it came to smoking and homer-making: "looking the other way" for certain rule violations gives managers leverage to pressure workers in other ways, and managers can "play favorites" by enforcing rules in some situations (or against some workers) and not others.[12]

But my goal here is not to argue that strict, to-the-letter enforcement of rules (or nonenforcement on the other hand) is altogether "good" or "bad"—the world is far too complex to make such a sweeping statement. Instead, I raise these examples to illustrate *how much of social life*, in the workplace and more broadly, relies on the "gap" between rules on the books and practices on the ground.[13] The "wiggle room" around rules is a site for strategic negotiation, for economic functioning, for relationship management—for both good and ill. So when we decide to more strictly enforce rules using

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technology, without accounting for what has been happening in the gap, we may well disrupt the social order of a particular context in important and unforeseen ways.

Despite this, the notion of "more perfect" enforcement via digital technology is a common refrain, often motivated by the idea that technology can help us to close the gap between rule and practice—transforming society into a more consistent and just version of itself. As David Friedberg, then CEO of data analytics firm Climate Corporation, described it in 2014: "Technology is the empowerment of more truth, and fewer things taken on faith."[14] Using technology, the logic goes, we can ascertain what people *really* do, instead of what they say they do; we can catch and deter cheaters and liars; we can generate knowledge where before we had only hunches and secrets; we can make people follow the rules.

Sometimes, digital enforcement happens through attempts to *prevent* violation, making rules more difficult to break—using code to make it more onerous (or even impossible) to deviate from an imposed rule.[15] For example, digital rights management technology makes it (nearly) impossible to violate copyright law.[16] If these technologies work as "perfectly" as intended, rule violation is completely impaired, and violation becomes practically impossible (or at least much more difficult).[17] But even more common than tools of prevention are tools of *detection*—technologies that function not by making rule-violating behavior more difficult to execute, but by creating a comprehensive *account* of our behaviors. These are surveillance technologies. For example, body-worn cameras don't make it impossible for a police officer to use unauthorized force against a civilian, but are intended to make the officer more accountable should they do so.[18] These technologies may work by deterring sanctioned behaviors—knowing that one is being observed can incentivize rule-following—or because they enable enforcers to more swiftly detect and punish rule-breaking.

Perhaps nowhere do we see this trend more clearly than in the workplace, where surveillance over workers' behaviors has become a favored method for compelling compliance with the aims of management. As we'll see, this practice has deep roots—but contemporary workplace surveillance has some new features, too.

Work and the Future of Work

We often anticipate the "future of work" in either dreamy or dystopian terms. The phrase has been widely adopted by technologists and commentators, either to describe a paradisical ideal in which people have much greater

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autonomy and flexibility to do work in ways that suit them while affording them ample time for leisure; or, as a dark alternative, as a future in which workers have ever-diminishing social and economic power and in which their every move and thought is overseen, predicted, and optimized by management, human or algorithmic. Both visions, though, are united by the assumption that the future of work (whatever it looks like) will happen, well, in the future—that is to say, this is a *vision* of a time that is not now, and that is somehow different than now, or at least different enough that it deserves its own label.

It's rather curious that we tend to talk in such future-oriented prognostications about what technological change will portend for work and the workplace. In other domains, the way we talk about technology tends to be more focused on what is occurring now or in the very near term; but when it comes to work, we maintain some temporal distance, at least in our discourse, from these changes. This is odd because the "future of work" is, of course, not some distant or discrete mode of social organization so unlike the one we have today. The management practices of tomorrow are, in many ways, not particularly different from the management practices of the past. They're built on the same foundations—motivating efficiency, minimizing loss, optimizing processes, improving productivity.[19] And one of the most common strategies for achieving these goals, then and now, is increased oversight over the activities of workers.[20]

So what *is* new about today's workplace surveillance? Is this not just more of the same, driven by the same organizational goals that have always motivated managerial oversight—even if the specific technologies that are used to do so have changed form in one way or another? Some workplace monitoring *is* old wine in a new bottle, a contemporary instantiation of the manager with a clipboard looming above the factory floor. This is not to say, of course, that these practices don't deserve scrutiny or critique—but we should be precise about what, if anything, is new here.

In fact, there are some subtle but important dynamics that distinguish contemporary workplace surveillance from what's come before, and that will become important in telling the truckers' story. First, contemporary technologies facilitate surveillance in *new kinds of workplaces*. Geographically distributed and mobile workers, for example, have historically maintained more independence from oversight than workers centralized in nonmobile workplaces, like factories, call centers, and office buildings—but location tracking, sensor technology, and wireless networking have changed that. Porous boundaries between home and work also facilitate surveillance in new places. For example, the growth of work-from-home arrangements

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during the Covid-19 pandemic has led to greater use of tracking software to monitor workers' keystrokes, locations, and web traffic—as well as video capture of the kitchen tables and living rooms in which their work now takes place.[21]

New kinds of data also come to the fore. As sensor technologies become cheaper and easier to deploy, and workplace surveillance capability is more frequently embedded in software by default, employers are well positioned to capture more and more fine-grained data about workers' movements and activities. Wearable technologies, like those used in Amazon's warehouses, monitor and evaluate workers' speed with much more precision than was previously possible—including the number and length of their bathroom breaks.[22] Employers increasingly monitor and analyze datapoints like workers' social media posts, phone calls, and attendance at meetings; Microsoft faced pushback in 2020 when it built "productivity scoring" into its widely used Office 365 product, which gave managers access to "73 pieces of granular data about worker behavior" like email and chat frequency.[23] And as we'll discuss, biometric data is also becoming more commonly collected in the workplace—from authentication mechanisms like fingerprint and retinal scans to behavioral data about workers' attention and fatigue.

These new data streams fuel *new kinds of analysis* that impact how workers are managed. In some contexts, managerial decisions are implemented through opaque algorithmic systems that can create acute information asymmetries between workers and firms—like Uber's use of algorithms to apportion rides and determine rates without making those rules transparent to its drivers.[24] Other analyses are predictive, designed to forecast which workers are likely to be most productive, how many workers to staff at a given time to meet demand, or which worker is likely to make a sale to a particular customer.[25]

Finally, contemporary workplace surveillance can blur boundaries between the workplace and other spheres of life, creating *new kinds of entanglements* across previously disparate domains. Surveillance of work-from-home environments can facilitate data collection about family, friends, and living situations. Managers often keep tabs on workers' online activities on social media platforms.[26] Workplace wellness programs can facilitate employers' collection of data about worker health, stoking concerns about discrimination.[27] And "bring-your-own-device" policies, in which an employer's software is installed on a worker's own personal phone or computer, can further muddle distinctions between home and work and create additional data privacy and security concerns.[28]

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The Trucking Workplace

All of these dynamics are at play in trucking. For decades, the mobile, isolated nature of truckers' labor provided a buffer against managerial oversight, giving truckers much more freedom and autonomy in their day-to-day work than other blue-collar workers. But this has changed drastically, owing to the proliferation of digital monitoring technologies like the ELD: the road no longer affords drivers the independence they once had. As we'll see, surveillance in trucking involves the collection of new kinds of fine-grained data about truckers' behaviors, bodies, braking patterns, even brainwaves. This data collection supports new forms of analysis: firms can compare truckers' performance against one another and predict what they are likely to do in the future—giving them much more visibility into, and control over, truckers' work than ever before. And as this book will explain, trucker surveillance involves deep entanglements among the interests of many different actors in different social spheres—not only the trucker, the government, and the firm, but also truckers' families, insurers, third-party companies seeking to make money from the data, and the public at large. As such, truckers may be canaries in the coal mine: investigating digital surveillance and rule enforcement in this industry can give us important clues about how these dynamics may function in other contexts, both within and outside the workplace.

Trucking is a job, but it is more than that. Trucks are understood by their drivers both as workplaces, relatively free of meddlesome bureaucratic oversight, and as homes, in which they live, eat, and sleep for days or even weeks at a time, and in which their privacy is sacrosanct. And similarly, understanding trucking as the mere activity of driving a truck is only one facet of what trucking means to those who call themselves truckers. Trucking work is bound up with cultural constructs of manhood and virility, performed through displays of physical and mental stamina. The icon of the "asphalt cowboy" has been an iconic figure in trucking for decades;[29] workers who strain against authority in traditional employment settings may self-select into trucking as an occupation in which the day-to-day routines of work have, traditionally, been largely self-directed. Trucking is an *identity*: an enactment of masculinity, a form of economic provision, and an extension of sexuality. Sociologist Raewyn Connell wrote that for working-class men, "bodily capacities *are* their economic asset"[30]—the ability to push their bodies up to and past the limit is how they maintain economic autonomy. The ELD reduces this autonomy and impugns the self-knowledge on which it relies. To a far greater extent than in many other workplaces in which digital

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monitoring has proliferated, in trucking such monitoring clashes acutely with truckers' collective and individual self-definition and occupational identities, built up over decades.

The ELD, then, operates simultaneously as a legal, economic, and cultural object. To regulators, it's a legal creation—the product of federal regulations designed to enforce compliance with rules, and a strategy to address safety problems that plague the industry (though with mixed evidence of effectiveness). To firms, it's primarily an economic tool to align workers' behaviors with organizational aims such as maximizing fuel efficiency and minimizing out-of-route driving. And trucking firms are major stakeholders in the formulation of the legal rules, since they too have interests in how much their drivers (and their competitors' drivers) may legally drive. To truckers, the ELD is a cultural object that challenges the value of their "road knowledge" and occupational identity, as well as long-held industry norms for getting work done independently. In this book, I'll consider how the ELD works in each of these ways, and how these different meanings of the ELD interact and clash with one another. The complex interplay of legal rules, socioeconomic organization, cultural norms, and technical capabilities that we find in trucking makes the industry a strategic site[31] for examining the interaction of multiple domains in shaping surveillance technologies.[32] Only by examining these dimensions together can we understand how and why digital enforcement works—or doesn't.

There are also key pragmatic reasons why trucking offers a strategic site for investigating digital enforcement and workplace surveillance. I examined trucking during a period of technological transition. To understand the impact of the ELD on the industry, I conducted ethnographic research with truckers, trucking managers, regulators, technologists, and others affiliated with the industry, across a wide variety of sites—trucking firms, truck stop bars, trade shows, regulatory meetings, and more. The bulk of my fieldwork occurred between 2011 and 2014—when the ELD was gaining traction within the industry and was the subject of active debate, but was not yet mandatory—and was supplemented through 2019, after the mandate had taken effect. (In Appendix A, I offer much more detail on the contours of the study, including my data sources and methodological approaches.) Studying ELDs during this period of transition was essential because it allowed me to observe and analyze differences between analog and digital systems. Moments in which the status quo is disrupted can be particularly illuminating occasions for unearthing the entrenched assumptions and power arrangements that undergird social organization.[33] Of course, ELD use was far from randomly distributed in the

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industry during this period; for reasons I'll discuss in chapter 3, large carriers tended to adopt the devices much earlier than small firms did. Nonetheless, the transition period was crucial to understanding and comparing practices with and without digital enforcement (as I do, for instance, in chapters 4 and 5) to fully understand its impacts on the industry.

The Road Ahead

This book does three things. In the first part of the book (chapters 1–3), I describe the problem that electronic surveillance is, ostensibly, being marshaled to solve in trucking—and what kind of political, economic, and cultural environment it is being integrated into. My goal in this section is to illustrate why using digital technology to enforce the rules in this environment is unlikely to be a successful endeavor; the social and economic history of trucking is crucial to understanding why.

Trucking is a kind of workplace unlike any other. Chapter 2 delves into the fascinating, and contentious, political and economic history of the long-haul trucking industry in the United States. Truckers were viewed as respected "knights of the highway" in the mid-twentieth century. But their professional public image had been decimated by the 1980s, when economic deregulation created a race to the bottom that depressed truckers' wages, made their work significantly more difficult, and led many truckers to feel like "throwaway people." The workday is long, dangerous, and extraordinarily tiring, and wages are significantly lower than they once were. As a result, the industry suffers from an incredible amount of labor churn, in which drivers enter and exit jobs quickly—either hopping among companies in search of more favorable conditions or exiting the industry entirely. Rather than responding by making conditions more humane or wages more competitive, the industry has responded by trying to compel new pools of potential drivers to enter trucking—for example, newly licensed eighteen-year-olds—often to the detriment of public safety. I discuss the peculiar per-mile pay structure in the industry, and truckers' legal exemption from federal labor standards—conditions that keep drivers from being paid for the true amount of work they do and that incentivize dangerous driving and overwork. Yet, despite all the economic and social problems plaguing the industry, trucker culture is strong and proud. Truckers' professional identity has long celebrated their independence, biophysical stamina, and control over their day-to-day work—even in the face of tightening controls from federal regulators and companies.

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Electronic surveillance enters the picture in chapter 3. In this chapter, I explain why truckers are so tired, what the government has tried to do about the problem, and how the ELD mandate eventually became the favored solution. By and large, truckers' reception of ELDs was not positive: truckers invoked concerns about their autonomy and privacy, as well as how more stringent enforcement of the hours-of-service rules was likely to harm them economically and to exacerbate logistical issues. In short, strict digital enforcement is at odds not only with the way the industry actually functions, but with its culture. We might accept these as necessary trade-offs if they in fact increased the safety of the public roads—but the best evidence we have demonstrates that the safety outcomes of electronic surveillance are mixed at best, and may actually lead to *more* accidents because of the inflexibility it introduces into trucking work.

Digital monitoring entered trucking as a technology of regulation—but its impacts on the industry have extended far beyond government enforcement of timekeeping rules. The second goal of this book is to show how digital monitoring has wide-ranging and complicated implications for social and organizational relationships in the industry. In the second part of the book (chapters 4–6), I take deep dives into understanding the ELD's role in three overlapping social spheres: as a tool for business, an object of inspection, and a locus for resistance.

I begin, in chapter 4, by investigating how the ELD operates as a business tool. The ELD augments trucking firms' ability to manage drivers in new ways—replacing the value of truckers' local and biophysical "road knowledge" with abstracted, easily compared data flows. The ELD is very often bundled with other monitoring capacities that track, in fine detail, many aspects of a trucker's behavior—how hard he brakes, how much fuel he uses, whether he is paying attention to the road—and gives back-office managers real-time access to all kinds of information about a trucker's day-to-day work, information that used to be within the exclusive purview of the trucker. Firms use this knowledge in a variety of ways—using analytics to foster competition among drivers, even leveraging drivers' connections with their families—in order to compel them to act in ways that favor the firm's goals. Even beyond managerial use, data from ELDs become valuable to other business interests—including insurers, freight brokers, and others; while some of these secondary uses might favor truckers, others may impose additional burdens on them. Further, monitoring systems play a role in the competitive political economy of the industry, offering comparative advantages to large firms while imposing disproportionate costs on independent truckers and

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mom-and-pop operations. We can think of government, corporate, and third-party data collection as being *interoperable*; while each has its own aims, the ELD bundles them together into a mutually enforcing whole.

Chapter 5 looks closely at the role ELDs played in inspection interactions between truckers and law enforcement officers prior to the ELD mandate. In the same way that ELDs have made some aspects of truckers' work more difficult, they similarly disrupted the work of commercial vehicle inspectors, who were unused to their inconsistent and often confusing interfaces. Inspectors are charged with ensuring the accuracy of a trucker's logbook, and they have cultivated their own professional practices for doing so. ELDs upended these practices in important ways. Inspectors inspecting paper logs once made strategic use of time and distance to establish authority—separating driver from log to conduct a careful, self-paced inspection of the driver's records. But because ELDs are often fixed *within* truck cabs, inspecting ELDs put the inspector in the cab *with* the driver, and put his lack of expertise about dealing with the ELD in the driver's full view. As a result, inspections of electronic logs were socially uncomfortable, undermined the inspector's authority, and could be far more cursory than inspections of paper logs—perhaps leading to some of the reduction in citation rates for drivers with ELDs, and counterintuitively placing the trucker and inspector into temporary alignment against a digital "common enemy." What's more, because truckers knew about inspectors' hesitation to inspect ELDs, they engaged in *decoy compliance*—strategically signaling to inspectors that they had an ELD in the cab, perhaps without actually having one—in order to convince the inspector to wave the truck through the weigh station without inspecting it. These practices show us that digital monitoring doesn't *necessarily* reinforce the authority of the state over the surveilled subject. The interactions that real people have around these technologies complicate this dynamic considerably and show us how these technologies can also destabilize power relations in surprising ways.

In chapter 6, I turn to how truckers "beat the box"—the wide variety of strategies truckers use to resist digital monitoring. These strategies run the gamut from smashing the monitor with a hammer to organizing collective protests; from exploiting an ELD's technical limitations in order to eke out more driving time to "hacking" the device to play computer solitaire. These strategies make use of different resources, involve different parties (sometimes including trucking companies themselves!), and have different goals—while some are designed to communicate, others are designed to obfuscate; while some are aimed at the government, others are aimed

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at companies; while some are about creating the flexibility to earn a living, others are about reasserting one's identity. The variety of trucker resistance practices raises important questions about what—and whom—resistance is for: does resistance "count" if it doesn't change anything structurally, or even reinforces exploitative labor conditions? Is resistance a "weapon of the weak," or can it be a way to push the least powerful even further down the ladder? The answer is that resistance to surveillance is all these things at once, and we understand resistance more clearly if we think of it as a means of negotiating social power, rather than merely as bottom-up refusal.

Finally, in the third part of the book (chapters 7 and 8), I look to the future. Here, my goal is to connect our study of electronic monitoring to other dynamics—the relationship between surveillance and automation, and the role surveillance may play in enforcing rules more generally. Our case study of the ELD provides a window to help us forecast what kinds of obstacles emerging technologies are likely to face and some ideas about how to think about technology as a tool to address social problems.

Chapter 7 asks: what will trucking look like in the near future, as autonomous vehicles become more widespread? Will there even be human truckers in twenty years, or will robots have taken over these jobs? Several economic forecasts have described trucking as a prime target for automation as artificial intelligence (AI) becomes more and more capable. And we can understand why: autonomous trucks don't get tired and might do a lot of the trucking labor that is so difficult and dangerous for humans; and they could, in theory, save millions of dollars in labor costs for trucking firms. The potential for human truckers to be displaced from the truck cab, physically and economically, raises serious concerns. But the reality is that autonomous technologies are very unlikely to replace truckers in one fell swoop, for a variety of legal, social, and cultural reasons. Instead of thinking about a cliff of sudden job loss, we should think about a gradual *slope*, in which humans and machines integrate their work with one another. In this chapter I consider various scenarios describing what that integration between human truckers and autonomous trucking might look like. I examine some of the technical and organizational roadblocks faced by different models of integration, and explain that the use of artificial intelligence in the trucking industry today is a very different experience than the displacement often imagined and feared. Rather than being kicked out of the truck cab by technology, the trucker is still very much in the cab, doing the work of truck driving—but he is increasingly *joined there* by intelligent systems that monitor his body directly and intrusively, through wearable devices and cameras, often

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integrated into the fleet management systems we discussed in chapter 4. AI in trucking is experienced as a *hybridization* of man and machine. Surveillance and automation in trucking are complements, not substitutes. In order to assess the true range of potential effects of AI on trucking work, we need to consider both the possibility of job replacement *by* robots and of bodily integration *with* robots.

To conclude, in chapter 8, I return to the issue of using technology to enforce rules, both within and beyond the workplace. Technology often fails as a solution because the problems it's intended to solve aren't, at their core, technology problems—they're social, economic, and cultural problems, and they require solutions in the same register. Trying to address these problems via technology often means insufficiently accounting for the world as it is. But this doesn't mean that technology has *no* role to play in addressing social problems, and I offer a few possibilities for how we might think about using technical solutions in the service of broader reforms.

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