TRENDS IMPACTING THE
DMV OF THE
FUTURE

AUGUST 2020

Acknowledgments

Disclaimer

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Introduction

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At the time of writing – July 2020 – Departments of Motor Vehicles (DMVs) in the United States and Canada have seen their business transformed by COVID-19. Historically, the mission of most DMVs has been to implement the driver and vehicle safety laws of their jurisdiction, including credentialing and testing of drivers, registration and securing and transferring title for vehicles, and processing of other licenses, fees, and fines. COVID-19 has accelerated some evolution of DMV approaches to these functions and has generated others. Still, in general, the pandemic and response have created a generational opportunity for DMVs to enhance their initiatives to offer efficient, productive, and modern services by:

- *Accelerating the shift to remote services* | DMV executives have observed that even when not expressly prohibited, face-to-face interaction has lost its appeal to customers. DMVs across the United States and Canada have accelerated or enhanced online services and limited in-person services to those requiring exchange of documents or demonstration of skills.

  Moving forward, DMVs have the opportunity to determine which services must occur face-to-face, which can be entirely conducted remotely, and which can be subject to screening. DMVs have the chance to ensure that only those customers most in need of in-person interaction receive it and that customer service staff can spend the necessary time with each customer.

  DMVs will make these determinations in the face of changing demographics, with generations differing in their desire for in-person or remote services. Also, DMVs may be able to take advantage of new online identity verification technologies to conduct a greater share of their business remotely.

- *Introducing DMVs to telework* | COVID-19 has caused many industries to reconsider their work-from-home policies, and DMVs are no exception. DMV executives report that their agencies remain productive using telework and that they will consider permanent work-from-home options when they can decrease costs and improve options for staff. A shift to remote services can facilitate this, as high-quality customer service can be provided from a staff member's home office.

  DMVs must decide how to make work from home work. How can privacy be preserved and sensitive information be protected with home offices? How do employees collaborate on tasks and communicate with each other, and does this require new software or equipment? Can certain tasks be privatized or permanently outsourced to increase efficiency? The coming months and years provide an opportunity to improve further and evolve the experience of working for a DMV.

The years ahead promise a reinvention of the DMVs' mission in light of technological and demographic advancement. Larger societal and technological changes were already acting on DMVs before COVID-19. Understanding these changes is the focus of this research, but the pandemic has amplified or accelerated nearly all of them. In the background, the development of automated mobility continues to suggest a future where "driving" is done and regulated in new and innovative ways. To meet these challenges, DMVs can enhance skills in their workforce and introduce new business practices and data management capabilities.

This research presents and explores major technological changes, new ways of working, and social trends to help DMVs prepare nimbly and robustly for their customers and their workforce.

Research Question

The objective of this research is to identify and address major societal and technological trends and how they might affect traditional DMV services over the next five-to-ten years (this period corresponds to the 2020s and will be referred to that way). The research addresses a broad range of trends, including demographics, public policy technology, key stakeholder impacts, and economics.

In addition, as COVID-19 occurred during the research, the scope has been expanded to include initial observations of how the pandemic and response have impacted and will continue to impact DMVs. To this end, the research explores how pandemic impacts interact with pre-existing and larger trends.

The research is organized around the concept of *scenario planning*. In scenario planning, planners propose a series of questions (what the project is studying, for whom, and why), then assess trends and their potential paths forward, and weave those pathways into plausible futures. Planners and public officials can then develop strategies that are effective in as many of the plausible futures as possible.

Interviews

This research is founded in the observations and insights of a group of DMV administrators, representing agencies in Arizona, California, Georgia, Maryland, New Jersey, Ontario, Oregon, Texas, and Wisconsin. Input was initially sought in Autumn 2019 through a one-hour interview format. Interviews touched upon demographics, public policy, technology, key stakeholder impacts, and economics, specifically drilling down on:

- The different preferences of senior and younger drivers.

- REAL ID[1] and opportunities for economic record-keeping, data storage, and data security.

- Evolving service delivery methods, digital-only products, and evolving retail spaces.

- The DMV's role in advancing/monitoring connected/autonomous vehicle research.

The complete interview guide can be found in Appendix A.

Literature Review

Interviews were conducted before the literature review to align sources with the interests of the interview participants (the primary customers of this research). In addition, the interviews suggested areas where sources would fill in the gaps that participants identified in their understanding. Subject matter experts enhanced the literature review on topics including automated vehicles, data security and management, and transportation policy. Sources for the literature review included:

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[1] The REAL ID Act of 2005 set standards for issuance of sources of identification, including driver's licenses, in the U.S. These include requirements for data to be collected as well as data to be shared with the Federal Government. https://www.dhs.gov/real-id-frequently-asked-questions

- Academic research from the Transportation Research Board (TRB), the American Association of Motor Vehicle Administrators (AAMVA), the American Automobile Association (AAA) and other institutions.

- Trade publications and product brochures, reviews, and commentaries (e.g., e-ink license plates).

- AAMVA member comments on the Department of Homeland Security (DHS) request for information on the Automated Solutions for the Submission of REAL ID Source Documents.

- Strategic Plans for AAMVA member DMVs.

COVID-19 Workshop

At the request of the Project Panel, the research team conducted a virtual workshop in May 2020 to understand the impacts of and strategies for COVID-19 in DMV operations. Participants in this workshop included the aforementioned DMV administrators, who were joined by the President of AAMVA and some members of her team, as well as a representative from the International Association of Transportation Regulators. Key takeaways from this workshop included opportunities that COVID-19 has given DMVs, such as focusing on remote services whenever possible and promoting and facilitating telework. A summary of takeaways from the workshop is provided in Appendix B.

Organization of this Document

This document includes the following:

- A discussion of identified *trends and the pathways they could take* into the future. While these trends were first identified before COVID-19, the discussion of them here has been framed around the two observations at the front of this section: DMVs are shifting toward the maximum possible remote service and telework. These trends shift in form and prominence with each plausible future, but they are key considerations for DMVs in all of them.

- A discussion of *plausible futures* for DMVs in the 2020s, each organized around a theme derived from the trends. Accordingly, these plausible futures are presumed to be equally likely, in that elements of each of them will likely occur at different times in different agencies. The plausible futures are presented in one-page series of question statements, suggesting areas of further thought for agency managers and thought leaders.

- A brief *implementation plan* that defines success for the research, lays out potential next steps, and briefly discusses how DMVs can effectively make organizational change.

Trends and Pathways

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Trends for DMVs fundamentally affect people – customers and the workforce:

- *Customers* | DMV services today are often sought by individuals – people looking to acquire or renew a license/ID; take a knowledge test; become certified to drive commercially; acquire or renew vehicle registration; acquire a business license to sell or salvage vehicles; or transfer a title upon purchase or sale of a vehicle; among others. There is a wide range of logistical requirements at play across these tasks, including scanning and reviewing documents; taking pictures; completing and signing forms; storing data and sharing it across jurisdictions; and performing these tasks securely to protect personally-identifiable information (PII).

- *Workforce* | DMVs and other organizations have found that telework may be sustainable in the years ahead for at least some back-office and customer service operations. The sudden operational changes caused by COVID-19 have served as a catalyst for addressing longstanding challenges related to productivity and collaboration, data security, and privacy.

This research has identified five trends based on common concerns identified in interviews and literature.

Young and Aging Drivers

In the past decade, DMVs have had to manage the preferences and needs of young and aging drivers. As the population as a whole is set to age in the 2020s, it is possible that the needs of different generations could diverge, with young drivers preferring digital and virtual services and older drivers seeking in-person interaction, either because of a lower comfort level with technology or because their services (such as medical evaluation and periodic road tests) cannot be performed online.

Following the 2009 recession, a growing number of young drivers were delaying getting a license, a trend contrary to previous generations. National polls[2] tied this trend the decline of teenage work, the availability of Uber and Lyft and other new mobility options, the proliferation of online entertainment, a consciousness of the environmental impacts of driving, and the cost of owning and maintaining a car, among other factors. The AAA Foundation for Traffic Safety (AAAFTS) found that 55% of young adults living in large cities at age 17 agreed that they could do everything that they needed to do without driving.

Nonetheless, in the later 2010s, economic recovery resulted in increases in the number of young people in the U.S. and Canada who obtained driver's licenses. Massachusetts Institute of Technology (MIT) researcher Joanna Moody has observed in 2020 that:

> *"Millennials' attitudes and behaviors are not so different from those of previous generations if you control for their socioeconomic environment and as they enter later life stages. Without interventions, the U.S. is not on a trajectory of decreasing car ownership and car use."[3]*

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[2] "Prevalence and Timing of Driver Licensing Among Young Adults, United States, 2019." AAA Foundation for Traffic Safety, 2019.

[3] Joanna Moody, "OK Vroomer: Millennials and Car Culture." Eno Center for Transportation, Webinar, March 12, 2020.

At the same time, DMVs have seen the number of aging drivers increase steadily and dramatically, as Americans and Canadians are expected to live and work longer than previous generations. Indeed, the U.S. Bureau of Labor Statistics has found that:

> *"Since 1996, [labor force] participation rates have steadily increased among the 65-years-and-older age groups. The participation rate for workers age 65 to 74 is projected to be 30.2 percent in 2026, compared with 17.5 percent in 1996."* [4]

A less dramatic increase from 16% in 2009 to 18.7% in 2036 for the over-55 cohort in the Canadian workforce has been forecast by the National Seniors Council.[5]

As shown in Figure 1,[6] the Maryland Motor Vehicle Administration has found that the number of licenses issued to people aged 60-69 years has doubled between 2010 and 2020.

FIGURE 1 | LICENSED DRIVERS BY AGE, MARYLAND MVA

Maryland Licensed Drivers By Age - Comparison of 2000 to 2020

98% growth; almost 665,000 in 2020

216% growth; almost 24,000 in 2020

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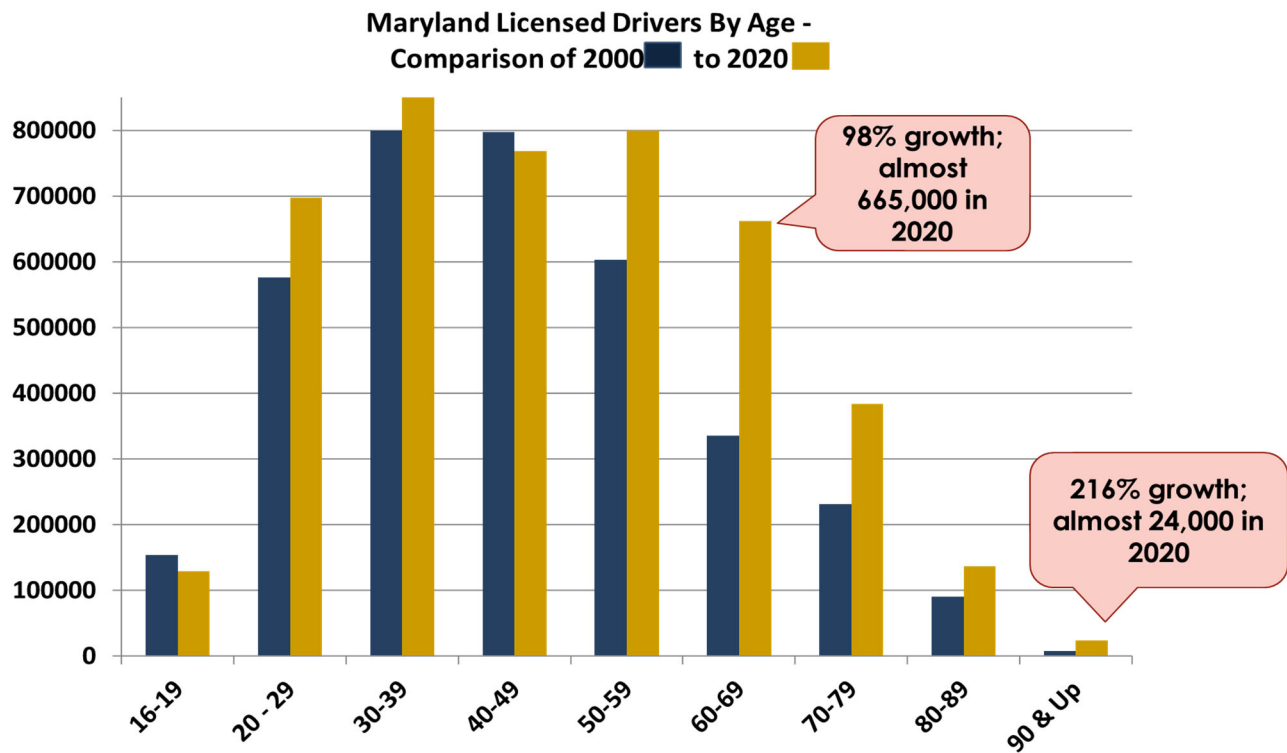
[4] Bureau of Labor Statistics, U.S. Department of Labor, The Economics Daily, Labor force participation rate for workers age 75 and older projected to be over 10 percent by 2026 on the Internet at https://www.bls.gov/opub/ted/2019/labor-force-participation-rate-for-workers-age-75-and-older-projected-to-be-over-10-percent-by-2026.htm

[5] "Report on the Labour Force Participation of Seniors and Near Seniors". National Seniors Council, October 2011. https://www.canada.ca/en/national-seniors-council/programs/publications-reports/2011/labour-force-participation.html

[6] Figure produced annually by Maryland Motor Vehicle Administration (MVA) and reproduced with permission.

While the cohort aged 90+ is much smaller, it has more than tripled in size over that period. Smaller-scale increases in the 50-59 and 70-79 cohorts fill out the picture of a growing population of senior drivers.

The picture from Maryland is borne out nationally by AAAFTS, which observed that:

> *In 2016 there were 41.5 million licensed older drivers 65 years or older. This age group is growing faster than any other age group. Older drivers 75-79 saw the largest single-year percentage increase (4.98 percent over the previous year). Although driving allows older adults to meet their mobility needs and to stay independent, a number of age-related functional impairments, medical conditions, and medication side effects can compromise driving abilities.[7]*

AAAFTS has built a large-scale research effort – the Longitudinal Research on Aging Drivers (LongROAD) study – to understand protective and risk factors; assess effects of medical conditions and medications; investigate mechanisms of self-regulation; explore the impact of technology; and identify the determinants and health consequences of driving cessation; all for the over-65 cohort.

DMVs have been aware through the past decade of the increasing importance of Medical Advisory Boards (MABs). Per AAMVA guidance, a Medical Advisory Board is comprised of licensed physicians and other appropriate professionals. It offers guidance to the DMV on license re-testing and suspension in cases where the continued operation of a vehicle by an individual would threaten public safety. The MAB works in concert with a DMV staff of case managers, who may be medically trained.

The data from Maryland, AAA, and others illustrates the increasing need for DMVs to support aging drivers and their families. As noted by the Georgia DMV in an interview, agencies have already begun to increase the presence of trained medical professionals in case management. DMVs recognize, however, that in addition to the medical questions, relinquishing one's driver's license is a major life milestone that should be managed with care beyond medical and safety concerns. In interviews and literature, DMVs noted that they could seek more case managers with mental health or emotional counseling backgrounds.

The trend of young and aging drivers could take several pathways forward:

Accelerating	• Young adults return to pre-recession licensure rates. Seniors seek licensure at advanced ages. • Customers demand widespread digital, mobile, and online service delivery.
Maintaining	• Young adult licensure remains above recent lows; seniors seek licensure at advanced ages but continue to self-regulate driving and support monitoring. • Customer groups require different methods of service, including digital.
Plateauing/ Reversing	• Young adult licensure declines from 2019 levels. • Seniors increasingly utilize alternatives to driving, lowering licensure rates.

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[7] "Longitudinal Research on Ageing Drivers (LongROAD)", *AAA Foundation for Traffic Safety*. https://aaafoundation.org/the-longroad-study-longitudinal-research-on-aging-drivers/

Connection, Integration, and Privacy

DMVs have increasingly become data management agencies, and the data in their hands are often sensitive – not just driving records, but PII (e.g., social security number, address, date-of-birth). Data collection and sharing promise opportunities for new and better services. Data sharing can also sharply reduce fraud. At the same time, DMVs are subject to national and state/provincial privacy legislation about how this PII is handled and shared and privacy advocates have expressed concern at instances where rules lack their preferred stringency or (in the case of REAL ID in the U.S.) mandate sharing of customer information.

In addition, there is variability among DMVs on how PII is stored and secured. A single breach at any DMV could undermine the public's confidence. As a result, DMVs are rethinking data security protocols.

Privacy and Data Sharing

DMVs face safety, security, and privacy imperatives both to share key information and also to keep it private. On one end, the public has an interest in ensuring that dangerous drivers who have accumulated violations and license suspensions in one jurisdiction are not unknowingly credentialed in another. Multiple attempts to obligate jurisdictions in both the United States and Canada to share this information over the past half-century[8] have left significant continued gaps in data sharing – many DMVs continue to resort to paper mailings to notify each other about dangerous drivers, and a 2020 investigation in the U.S. found that 14 DMVs reported accumulating a backlog in processing the paperwork.[9] Responding to the investigation, Massachusetts Secretary of Transportation Stephanie Pollack noted that:

> *"Ultimately it is not realistic to expect that individual states and their trade associations are going to be able to put together a nationwide system without Federal involvement and Federal resources."*[10]

Overlapping with and extending beyond these safety data sharing needs, U.S. DMVs have spent significant effort and time over the past five years implementing Federal REAL ID requirements to:

> *"Provide electronic access to all other states to information contained in the motor vehicle database of the State." Each state's database, at a minimum, must include "all data fields printed on driver's licenses and identification cards issued by the State," as well as "motor vehicle drivers' histories, including motor vehicle violations, suspensions, and points on licenses."*[11]

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[8] These include two voluntary interjurisdictional compacts – the Driver's License Compact (DLC) and the Driver License Agreement (DLA), neither of which includes all DMVs. The National Driver Register (NDR) is maintained by the U.S. Federal Government but DMVs are required to reference it only when renewing or issuing a license (as opposed to frequently checking it to update out-of-jurisdiction violations).

[9] Vernal Coleman, Matt Rocheleau, et al, "Dangerous Drivers Should Have Lost Their Licenses. They Didn't – And Others Died." *The Boston Globe*, August 18, 2020.
https://apps.bostonglobe.com/2020/08/metro/investigations/blindspot/part-1/

[10] Vernal Coleman, Laura Crimaldi, and Matt Rocheleau, "Morally, do I feel responsible… Yes." *The Boston Globe*, August 18, 2020. https://www.bostonglobe.com/2020/08/18/metro/morally-do-i-feel-responsible-yes/

[11] Joan Friedland, "Updates on REAL ID and Increased Information Sharing by Departments of Motor Vehicles." *The Torch*, National Immigration Law Center, January 2018. https://www.nilc.org/news/the-torch/1-04-18/

DMV executives value the benefits of cross-jurisdictional collaboration. Beyond the safety imperative to share violation information, they cite the ideal of "one person, one product" and the inefficiencies and potential dangers of people maintaining simultaneous licenses in multiple states or generating duplicate titles on a vehicle. Data sharing with other public agencies can also fight identity theft and other types of fraud.

Balanced against these benefits is personal privacy, and restrictions to protect it vary across jurisdictions. While the U.S. does not have a blanket national privacy law, drivers' motor vehicle records are limited to specific uses by the Drivers Privacy Protection Act.[12] Some states have more general privacy laws, and collection and cross-jurisdictional sharing of PII by DMVs is required by REAL ID laws. Canadian DMVs are subject to a multi-layered set of privacy laws, including the Personal Information Protection and Electronic Documents Act and provincial laws that build on and around it. At a high level, these privacy laws set guardrails around (a) what Canadian government agencies and companies can collect and why; and (b) the ways in which customers must consent to the collection of PII.[13]

These restrictions are important in the face of frequent requests for driving records and other PII from non-governmental sources, including insurance companies, market research firms, and attorneys.

Connected Credentials

Information collected and shared by DMVs cannot be brought to bear on the customer experience without the ability to verify identity remotely. If scans or photos of documents cannot be trusted, or if e-signature, phone-based biometrics, or other I.D. systems do not measure up to the standards required of DMVs, it will be difficult for DMVs to expand their online or app-based offerings. Financial institutions, health providers, and other services have embraced online services over the past ten years. Some DMVs have followed suit – Arizona, for example, uses facial recognition software to verify identity for e-title processing.

The potential rewards of trustworthy digital identity verification are significant. One AAVMA member called an electronic, smartphone-based license (referred to by AAMVA as a mobile driver's license, or "mDL") the "holy grail," and several states and provinces have already begun to pilot the technology. Approximately a dozen states, provinces, and the District of Columbia in the U.S. and Canada have implemented pilots or full rollouts of digital driver's licenses.[14] AAMVA has been coordinating this effort by documenting the functional needs and practical considerations for mDLs to be trustworthy, accurate, updated, and secure, and for mDLs to be applicable in all current use cases for licenses.[15]

Beyond the license, digital, live-updatable license plates, capable of displaying "push" notifications or displaying information other than the plate number (e.g., parking permits, presence of a student driver, or

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[12] 18 U.S. Code § 2721. Prohibition on release and use of certain personal information from State motor vehicle records.
[13] Connected and autonomous vehicles in Ontario: Implications for data access, ownership, privacy and security." Deloitte LLP and Government of Ontario, 2018.
[14] Tom Metcalfe, "What new digital driver's licenses mean for motorists, police." *Mach*, NBC News. May 24, 2018. https://www.nbcnews.com/mach/science/what-new-digital-driver-s-licenses-mean-motorists-police-ncna875576
[15] "Mobile Driver's License Functional Needs White Paper 0.9". AAMVA, 2019.

other content selected by the vehicle owner, the manufacturer, or the Government), are already commercially available. DMVs may be asked to play a role in managing the back end of these technologies.

Pathways

The trend of connection, integration, and privacy could take several pathways forward:

Accelerating	• DMVs significantly expand the breadth of online services. • mDLs and digital license plates become the norm in all jurisdictions. • Driver and vehicle information are seamlessly transferable across jurisdictions. • Recognizing the value of their data, DMVs invest heavily in more secure systems and develop robust cybersecurity and privacy protocols.
Maintaining	• Some jurisdictions move forward with connected credentials, but not all. • Digital versions not the "system of record"; paper copies still required. • Current privacy requirements remain in force without major updates.
Plateauing/ Reversing	• Capacity, cost, or privacy constraints limit the adoption of connected credentials. • DMVs pare down digital offerings in response to security or privacy concerns. • Data breaches or other security failings discourage digitization of some processes/continued I.T. advances.

Future Mobility

AAMVA members interviewed for research recognized that "from a vehicle registration standpoint, we may have to think about what the role of the vehicle is moving forward." Further, interviewees identified Uber, Lyft, and similar mobility companies as having an impact on licensure rates. While trends in licensure rates were discussed in an earlier section, this trend focuses on advanced driver assistance systems (ADAS), autonomous vehicles, and commercial drivers as additional elements of future mobility with a direct link to DMV services and responsibilities.

Advanced Driver Assistance Systems

In 2014, *Toward Zero Deaths*, a collaborative effort supported by AAMVA and seven other national transportation, engineering, and medical organizations, identified "safer vehicles" as a key initiative for reducing road fatalities. Key to making vehicles safer in the years since has been the proliferation of ADAS that alert drivers to risks; assist drivers who are at risk of a crash; protect vehicle occupants during crashes; enable communication with other vehicles and with the roadway; and ensure vehicles continue to perform as designed.[16] By 2020, these technologies are common across all manufacturers and are available to some

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[16] "Toward Zero Deaths". The Toward Zero Deaths Steering Committee, 2014, p.29.

extent in all but the most bare-bones of vehicles (back-up cameras have been mandated in all vehicles sold in both Canada and the U.S. since 2018).

ADAS represents a significant opportunity to make roads safer – the National Highway Traffic Safety Administration (NHTSA) in the U.S. states that the vast majority of vehicle crashes are tied to human error that could be reduced by ADAS. DMVs have found, however, that the proliferation of ADAS presents challenges to the traditional skills test for drivers. AAMVA's 2019 guidelines for ADAS-aware driver testing[17] recommend that knowledge of safety-critical warning and assist systems be incorporated into driver training and knowledge tests, while "convenience technologies" (i.e., adaptive cruise control and automated parking) should be disengaged during testing. The AAMVA guidelines cite a need to update many types of guidance, documentation, and training materials to keep pace with technology.

Autonomous Vehicles

For those DMVs that have interacted with vehicle automation, the effort has so far been largely limited to participation in committees, task forces, and study groups. This reflects the limited implementation of autonomous vehicles in the United States. It is possible, however, that the 2020s will see some substantial implementation of autonomous vehicles in limited applications, such as trucking, buses, and rideshare/taxi services. Not only would this have implications for the humans who are paid to operate these vehicles today, but even a limited implementation of self-driving systems will immediately raise questions of regulation and approval for autopilot "drivers."

The current discussion about DMVs' role in autonomous vehicle regulation is summarized by the U.S. Congressional Research Service (CRS):

> *Legislation did not pass the 115th Congress due to disagreements on several key issues, including the extent to which Congress should alter the traditional division of vehicle regulation, with the Federal Government being responsible for vehicle safety and states for driver-related aspects such as licensing and registration, as the roles of driver and vehicle merge.[18]*

There is some agreement that self-driving systems will need to be tested and licensed, but much discussion as to how testing and licensing will differ for software as opposed to people. Researchers at the University of Michigan, for example, point out that novice human drivers are assumed to learn from experience and, therefore, can be tested on representative situations or allowed graduated driving privileges.[19] A particular version of an autonomous system, by contrast, likely either will or will not have the capability to handle a situation, forever. The question then arises: what level of comprehensiveness is required in the testing of autonomous systems, and what level of comfort will humans have with the inevitable but rare gaps?

Beyond jurisdictional debates in government, corporations are preparing for automated "licensing" both as a regulatory environment and as a market in and of itself. In 2019, graphics processor maker Nvidia

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[17] "Guidelines for Testing Drivers in Vehicles with Advanced Driver Assistance Systems". AAMVA, 2019.

[18] Bill Canis, "Issues in Autonomous Vehicle Testing and Deployment", Congressional Research Service, 2020.

[19] Michael Sivak and Brandon Schoettle, "Should We Require Licensing Tests and Graduated Licensing for Self-Driving Vehicles?", University of Michigan Transportation Research Institute, 2015.

announced to press attention that it would partner with a private German standards establishment company to develop a licensing and testing system based on its own (open source) software platform.[20] It stands to reason that Nvidia will not be the only company urging the adoption and support of its products, and NHTSA has, in recent years, left the development or selection of testing and certification platforms in the U.S. to states.[21] [22] This points to a significant challenge that DMVs may face in the 2020s: dealing with large automakers and technology companies as increasingly prominent customers.

The dangers inherent in regulating prominent, well-capitalized companies with technical expertise and significant resources and political influence are recently evident in the certification of the Boeing 737 MAX. In that case, the U.S. Federal Aviation Administration (FAA), lacking in the knowledge and wherewithal to conduct certification tests of an autopilot system internally, relegated many of those tests to Boeing, and even sometimes delegated their review of Boeing's tests to back to the manufacturer, resulting in the loss of hundreds of lives.[23] Regulators of technical systems must necessarily have the technical skill to understand and evaluate those systems, a level of impartiality untainted by significant ties or loyalties in industry, and the power to make engineering judgments without political pressure.

It is not yet certain that DMVs will be responsible for those engineering judgments. The jurisdiction of rulemaking has not been resolved and may differ between the United States and Canada. To the extent that DMVs are charged with oversight, however, it may come as a sudden, significant demand.

It should also be noted that autonomous vehicles pose privacy challenges. Autonomous vehicles require the collection and sharing of vast amounts of data, both with infrastructure and with other vehicles. Writing for the Government of Ontario, researchers from Deloitte noted in 2018 that:

> *The purported benefits of connected and autonomous vehicle data for government, private sector companies, and the public at large are promising. Realizing these benefits... is contingent on establishing standards around safe and sustainable use of vehicles, protocols for secure transmission, storage, and use of data, supporting, interoperable infrastructure to enable data flows, and compliance with privacy laws and best practices related to efficient and secure sharing of data across partners.[24]*

Commercial Drivers

The American Transportation Research Institute (ATRI) conducts an annual survey of the trucking industry to identify the top issues and concerns. An acute driver shortage has held the top spot in the three

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[20] Antuan Goodwin, "Nvidia developing an 'autonomous car driver's license' based on its tech". *CNET*, March 18, 2019. https://www.cnet.com/roadshow/news/nvidia-tuv-sud-self-driving-cars-drivers-license/

[21] "Preparing for the Future of Transportation", *US Department of Transportation*, 2018.

[22] Aarian Marshall, "Who's Regulating Self-Driving Cars? Often, No One". *Wired*, November 27, 2019, https://www.wired.com/story/regulating-self-driving-cars-no-one/

[23] "Timeline of Activities Leading to the Certification of the Boeing 737 MAX 8 Aircraft and Actions Taken After the October 2018 Lion Air Accident". US Department of Transportation Office of Inspector General, June 29, 2020. https://www.oig.dot.gov/library-item/37940

[24] Connected and autonomous vehicles in Ontario: Implications for data access, ownership, privacy and security." Deloitte LLP and Government of Ontario, 2018.

most recent surveys.[25] The American Trucking Associations (ATA) estimates that 60,000 drivers are needed today, with a potential shortfall of 100,000 drivers over the next 10 years.[26] As reported by the Canadian Press in 2020, Canada faces a similarly daunting shortfall – a shortage of more than 20,000 drivers, and a job vacancy rate of 6.8% in the industry have cost trucking companies over CA$3 billion in lost revenue.[27]

The strategies proposed by ATRI in the U.S. have limited applicability to DMV operations. They include a Congress-sponsored apprenticeship program, recruitment of women and minorities, and collection of safety and performance data based on age. DMVs have an important responsibility to this high-stakes industry. As one DMV executive put it:

> It's a highly-regulated industry, lots of moving parts, people driving very large vehicles, and we're tasked with making sure they're safe.

The continued driver shortfall is set against a backdrop of COVID-19 disruption and increasing automation and driver assistance. Trucking is among the transportation industries deemed essential in the United States – the Federal Motor Carrier Safety Administration (FMCSA) has relaxed certain regulatory requirements around health checks for drivers and learners permit holders during the pandemic.[28]

COVID-19 has also impacted the distance covered by a typical truck trip. The growth of e-commerce with large-scale retail closed has driven investment in last-mile delivery solutions. Furthermore, as reported in a June 2020 *Transport Topics* article,[29] the pandemic may have changed workforce preferences and behavior – while turnover has declined in the face of layoffs in other industries, one industry executive said:

> "Long term, I don't see a workforce wanting to haul freight across the country. This pandemic has created a sense of wanting to stay closer to home and family."

Long-haul trucking may also be impacted by increasing automation and ADAS in the coming years. One immediate application is in truck platooning, in which multiple trucks travel together at electronically-coordinated speeds at following distances that are closer than would be reasonable and prudent without the coordination.[30] Though there has been limited implementation, "first generation" platooning, in which each truck has its own driver with varying dependence on ADAS, is approved in 27 states as of May 2020,

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[25] "Critical Issues in the Trucking Industry – 2019", *The American Transportation Research Institute*, October 2019, https://truckingresearch.org/wp-content/uploads/2019/10/ATRI-Top-Industry-Issues-2019-FINAL.pdf

[26] Eric Miller, "ATA: Trucking Industry was Short More Than 60,000 Drivers in Meeting Demand at End of 2018." Transport Topics. July 24, 2019. https://www.ttnews.com/articles/ata-says-truck-driver-shortage-course-double-decade

[27] Christopher Reynolds, "Report sounds alarm over truck driver shortage as job vacancies rise." *The Canadian Press*, March 11, 2020. https://www.thestar.com/business/2020/03/11/report-sounds-alarm-over-truck-driver-shortage-as-job-vacancies-rise.html

[28] American Trucking Associations COVID-19 Hub: https://www.trucking.org/COVID19
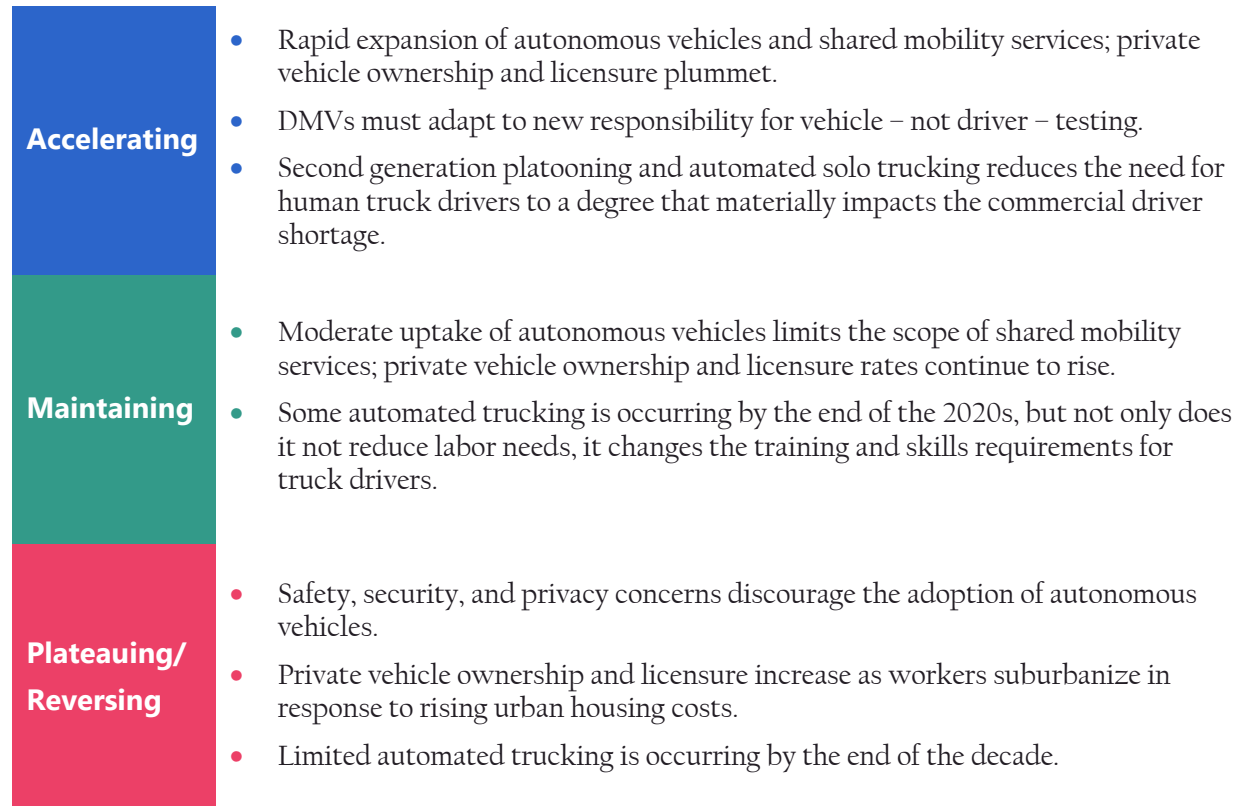
[29] Katie Pyzyk, "How the Coronavirus Pandemic Might Reshape Trucking's Future". *Transport Topics*, June 22, 2020.

[30] Pennsylvania Department of Transportation: https://www.penndot.gov/ProjectAndPrograms/ResearchandTesting/Autonomous%20Vehicles/Pages/Platooning.aspx

which together account for over 80% of annual U.S. Truck Traffic.[31] "Second generation" platooning will involve largely-automated operation of following trucks with a human driver in the lead truck and may enter the conversation by the end of the decade, with implications for fuel consumption, safety, and labor.

Pathways

The trend of future mobility could take several pathways forward:

Accelerating	• Rapid expansion of autonomous vehicles and shared mobility services; private vehicle ownership and licensure plummet. • DMVs must adapt to new responsibility for vehicle – not driver – testing. • Second generation platooning and automated solo trucking reduces the need for human truck drivers to a degree that materially impacts the commercial driver shortage.
Maintaining	• Moderate uptake of autonomous vehicles limits the scope of shared mobility services; private vehicle ownership and licensure rates continue to rise. • Some automated trucking is occurring by the end of the 2020s, but not only does it not reduce labor needs, it changes the training and skills requirements for truck drivers.
Plateauing/ Reversing	• Safety, security, and privacy concerns discourage the adoption of autonomous vehicles. • Private vehicle ownership and licensure increase as workers suburbanize in response to rising urban housing costs. • Limited automated trucking is occurring by the end of the decade.

Distance-Forward and Front Door Service

DMVs are often called the "front door to State/Provincial Government" – the first place new arrivals go to register themselves and their vehicles. This role places service delivery front-and-center, with opportunities developing over the past decade to move a large portion of DMV services online. In addition, DMVs in some jurisdictions serve as a portal to other services (or share service center space with other agencies, organizations, and companies), such as voter registration.

Before COVID-19, the primary concern of DMV customer service in the United States was the crush loading caused by REAL ID. While the U.S. Federal Government has extended the deadline to October

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[31] Richard Bishop, "U.S. States are Allowing Automated Follower Truck Platooning While the Swedes May Lead in Europe". *Forbes*, May 2, 2020. https://www.forbes.com/sites/richardbishop1/2020/05/02/us-states-are-allowing-automated-follower-truck-platooning-while-the-swedes-may-lead-in-europe/#a192c84d7e8d

2021 and effectively hit a pause button on processing licenses, a daunting task remains. According to the U.S. Travel Association, 72% of Americans either did not have a REAL ID-compliant driver's license or were unsure if they did when polled in 2019. In addition, 57% were unaware of the deadline.[32]

The need to move so many customers through an in-person process – one DMV executive noted that 13-20 million people need to be processed in approximately 11 months when the agency is used to processing 800,000 people per month – has made agencies rethink crowd management and physical layout practices. DMVs have sought to encourage digital service whenever possible, reserving trips to brick-and-mortar offices for limited purposes.

DMVs offered and encouraged online services for many years before COVID-19. The Massachusetts Registry of Motor Vehicles, for example, tracks the percentage of license renewals performed outside of offices (i.e., online or at AAA) monthly as a principal performance metric.[33] In the office, the Nevada DMV experimented with a load management system to optimize their field offices:

> *The agency found that customers with appointments did not complain about wait times, but walk-ins became increasingly frustrated the longer their transactions took. If the department focused solely on walk-ins, there was an adverse effect on those with an appointment.*
>
> *The DMV needed a tool that would provide near-real-time analytics so the 18 offices throughout the state could focus resources where the data showed it was needed most. A typical transaction takes about 11 minutes. With the metric dashboards... managers can identify a transaction lasting longer than average and provide additional assistance to staff on a case-by-case basis.[34]*

COVID-19 has only accelerated this trend by temporarily closing many DMV offices and placing safety restrictions (such as occupancy limits) on those that remain open at the cost of efficiency. In discussing their post-COVID future, DMVs have expressed enthusiasm for accelerating the use of online services.

Under a "Distance-Forward" model, every effort would be made to facilitate digital or virtual service. Every in-person customer would make an appointment in advance, with a load management system available to alert staff to walk-ins or appointment requests that will require additional time or expert attention. The sidebar on the following page provides a hypothetical illustration of a Distance-Forward service model.

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[32] "Study: Millions of Americans Could Be Affected by REAL ID Deadline in 2020." US Travel Association, September 2019. https://www.ustravel.org/press/study-millions-americans-could-be-affected-real-id-deadline-2020
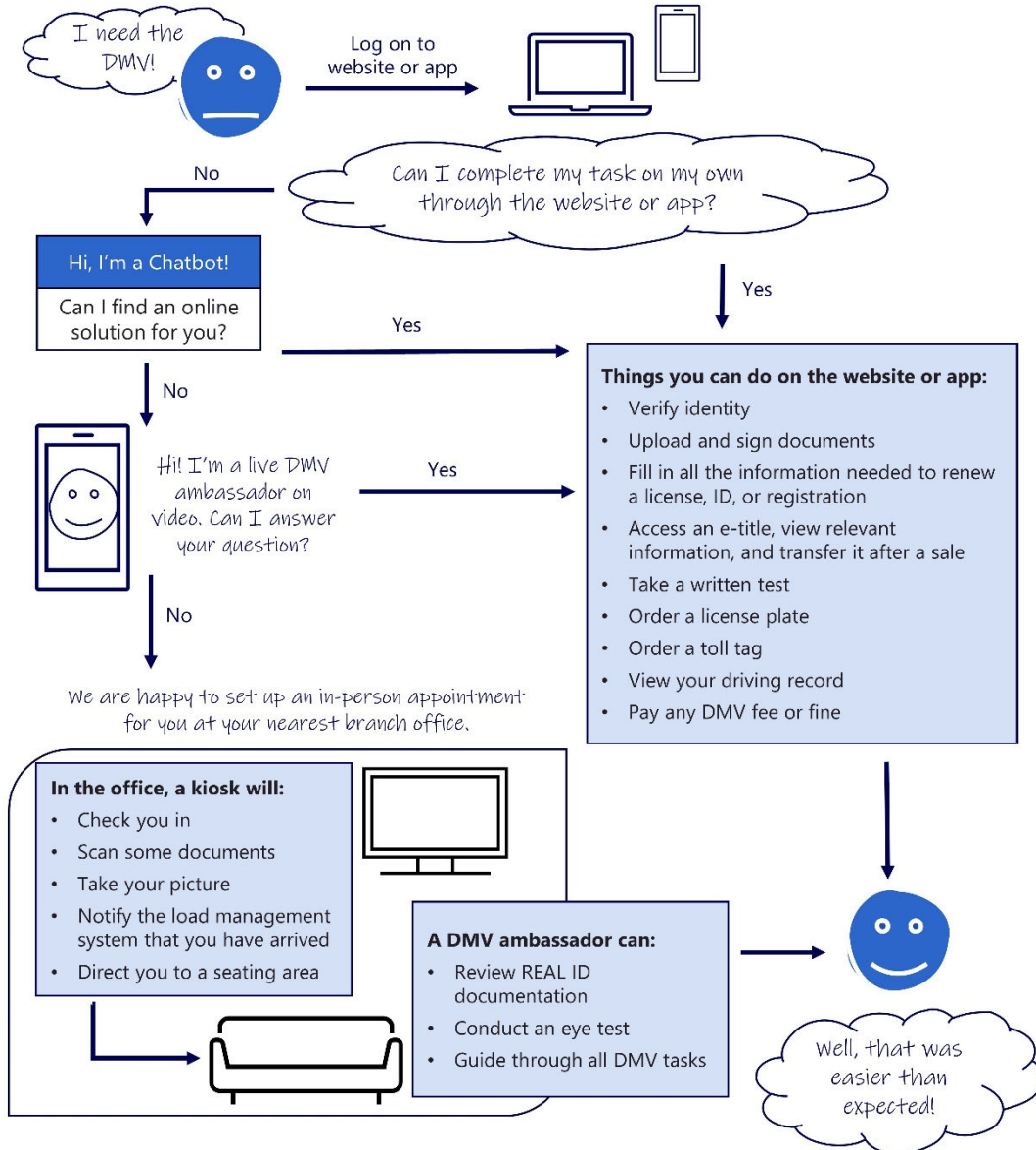[33] "MassDOT Tracker 2019." https://www.massdottracker.com/wp/?p=2956
[34] Patrick Groves, "Real-Time Analytics to Help Nevada DMV Adapt to Real ID Push", Government Technology, February 2020.

Distance-Forward Service

TRENDS IMPACTING THE
DMV OF THE FUTURE

COVID-19 has the potential to push DMVs to adopt a "Distance-Forward" service model – one that encourages customers to use online and digital services at multiple points in the process. Contrasting with a fully-in-person model (the customer arrives at a DMV office, is greeted by a human, is handed a number or buzzer, and waits for word to proceed to a desk to complete service), the model shown here is within reach of DMVs within the next decade.

I need the DMV!

Log on to website or app

Can I complete my task on my own through the website or app?

No

Hi, I'm a Chatbot!

Can I find an online solution for you?

Yes

Yes

No

Hi! I'm a live DMV ambassador on video. Can I answer your question?

Yes

No

We are happy to set up an in-person appointment for you at your nearest branch office.

Things you can do on the website or app:

- Verify identity
- Upload and sign documents
- Fill in all the information needed to renew a license, ID, or registration
- Access an e-title, view relevant information, and transfer it after a sale
- Take a written test
- Order a license plate
- Order a toll tag
- View your driving record
- Pay any DMV fee or fine

In the office, a kiosk will:

- Check you in
- Scan some documents
- Take your picture
- Notify the load management system that you have arrived
- Direct you to a seating area

A DMV ambassador can:

- Review REAL ID documentation
- Conduct an eye test
- Guide through all DMV tasks

Well, that was easier than expected!

DMVs have innovated on their brick-and-mortar experience in other ways in the 21st Century. Some have implemented kiosks that mimic the functions of the website/app for those without internet or smartphone access. They could use outreach events to interact with and help customers in familiar and convenient environments (e.g., a senior center, community center, or high school), following successful examples such as the Virginia DMV's "DMV Connect".[35] In some cases, DMVs have concluded that they can privatize in-person services; DMV services have been successfully provided by third parties such as AAA (in the U.S.) or ServiceOntario (in Canada).

The trend of Distance-Forward and front door service could take several pathways forward:

Accelerating	- Customer demand increases for digital and virtual services after COVID-19 eases, either due to increased comfort developed during the pandemic or due to safety concerns. - DMVs embrace the potential to provide a world-class digital platform for new arrival services. - Many DMVs implement many elements of the Distance-Forward model.
Maintaining	- DMVs continue to offer connections to new arrival services, albeit with little emphasis on user experience. - Some elements of Distance-Forward service are implemented in some DMVs.
Plateauing/ Reversing	- Customers demand in-person services after COVID-19 eases, frustrating any effort to focus on digital and virtual services. - Coordination or security challenges reduce DMVs' ability to connect customers to new arrival services across agencies effectively. - Budgetary constraints limit the ability to retool brick and mortar locations.

Telework

DMVs report an interest in making the telework necessitated by COVID-19 permanent to some degree. Telework offers opportunities for more flexibility and dynamic response to customer demand, as agencies can shift employees between offices and tasks more seamlessly, deploying their skills where and when support is needed. One DMV even speculated that remote workers could be deployed in shifts to provide "around the clock" coverage (e.g., by having employees in different time zones, or by giving employees the choice to align their work schedule with their preferred daily/nightly routine). Telework allows DMVs flexibility to develop both a more generalized and more specialized workforce, depending on employees' preferences and their states'/provinces' changing needs.

A shift to remote customer service for staff who have long performed every aspect of their jobs in-person might have other implications for DMV operations:

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[35] https://www.dmv.virginia.gov/general/#dmv_connect.asp

- DMVs may need to provide employees with consistent access to a wide range of training courses.

- DMVs may need to invest in remote collaboration platforms such as Slack or Microsoft Teams – these platforms are sometimes integrated into larger licenses for productivity tools (e.g., Teams within Microsoft 365[36]), adding new dimensions to software procurement. DMVs may also need to consider virtual private networks (VPNs)[37], in order to ensure that employees accessing customer information from home are doing so securely.

- Like many government agencies, DMVs already faced significant digitization efforts (i.e., entering historic hard-copy data into computer systems) before COVID-19. Telework provides the opportunity to shift more staff to these tasks in spare moments.

- Telework and remote customer service may sharply reduce the need for staff to process paperwork. Instead, the Distance-Forward Service model requires the typical DMV staff member to be well-versed in the use and maintenance of websites, databases, and apps.

- DMVs have generally chosen either a cloud-based data management solution or one locally-hosted in a mainframe. The telework use case may lead DMVs to reconsider their choices, as cloud-based solutions typically provide superior at-home access for employees.

DMVs may need to decide whether their "new normal" will resemble the DMV of 2019. As food for thought, Chapter 4 provides best practices on organizational change management.

The trend of telework could take several pathways forward:

Accelerating	- DMVs make a profound, lasting transition to telework. - DMVs develop a multi-talented staff whose roles and responsibilities are flexible and who can be deployed in an agile way to solve problems. - DMVs invest in collaboration and shared data systems to ensure efficient work in a range of different workplaces.
Maintaining	- DMVs allow telework after COVID-19 eases but do not encourage it in all cases. - Some DMVs invest in collaborative systems, but others remain on their traditional mainframe and email approaches.
Plateauing/ Reversing	- DMVs return almost all employees to field offices full-time after COVID eases. - Budgetary constraints limit the extent DMVs can enhance I.T. systems.

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[36] These specific products are mentioned for illustrative purposes only and the research does not endorse them in particular. Other products in this space include Google's G Suite, Apple's iWork, Zoom, Cisco WebEx, GoToMeeting, Workplace by Facebook, BlueJeans by Verizon, Discord, Dropbox, and Box, among many others.

[37] A virtual private network, or VPN, creates an encrypted tunnel from a user's computer to a server at a different digital location, which then performs all web tasks. Private citizens use VPNs to prevent third parties from spying on their online activity or to access region-locked content by pretending to be located in a different country. Organizations use VPNs to ensure secure access to internal networks and data storage – the employee's computer is digitally "in the office".

Plausible Futures

3

This research wove plausible futures from the trends and pathways by combining them in logical ways around themes, completing the sentence: "the near-to-medium-term future of the DMV will be primarily driven by _____."

In considering these plausible futures, it may be helpful to consider their impact on key current DMV functions. As expressed by our interview participants, these include:

- Licensure of private and commercial operators.

- Voter registration and issuance of identification cards that do not convey driving privileges.

- Inspection and registration of personal, commercial, alternative fuel, and high-occupancy vehicles.

- Collection and accounting of fees and fines.

- Management of data, including:

    - Personally-identifiable information (e.g., address, birth date, social security number).
    - Financial information (e.g., credit card number, bank account number).
    - Records for payments and invoices.
    - Vehicle titles.
    - Driving or traffic records, including those forwarded from other jurisdictions.

It may also be helpful to consider some human interest questions in all of these plausible futures:

Who are the DMV's customers moving forward?

What skills will DMV employees need?

What will DMV employees do all day?

This section consists primarily of three "white papers" – one-page summaries of the plausible futures:

- *Heads in the Cloud* | Automated vehicle sharing changes society and DMVs respond to the demands of technology.

- *Private and Protected* | DMVs focus on safeguarding personal data amid privacy concerns.

- *Demographic Traffic* | Diverging preferences among customers lead DMVs to focus on excellent service.

Because this research focuses on trends that could impact the future, rather than on specific actions DMVs could or should take, the white papers are framed around questions for DMVs to consider in response to hypothetical changes in society and technology.

Heads in the Cloud

Automated vehicle sharing changes society and DMVs respond to the demands of technology

If DMV customers grow to expect digital delivery of services and products...

- Will all driver's licenses become smartphone apps or tied to new personal devices?
    - Will jurisdictions align their offerings and adopt consistent standards?
    - Will private entities that rely upon driver's licenses to provide ID (e.g., bars) be able to trust and validate digital licenses?
    - Will digital licenses facilitate new functionality, such as biometric identification?
- Will all license plates become connected screens, mandated in all new vehicles?
    - Can registration be handled online, with the label updated over-the-air?
    - Who controls e-plate content? The DMV? The User? Law Enforcement?

Credit: Reviver Auto

Credit: Iowa Department of Transportation

If DMVs in the US and Canada develop the tools and protocols to fully share data...

- Will DMVs be able to act quickly in response to violations across jurisdictions?
- Will commercial licensure and permitting become easier to align across jurisdictions?
    - Will DMVs be guaranteed a single point-of-truth/record for each customer?
    - Can commercial drivers be licensed for multiple jurisdictions?
- Will DMVs be able to largely eliminate title fraud?

If automated vehicles begin to supplant some driving in urban and suburban areas...

- Will DMVs need to "license" self-driving software instead of drivers?
    - How will governments "test" AI software once it becomes routine?
    - How will large corporations behave as DMV customers (vs. individuals)?
- Will uneven adoption of automated vehicles regionalize DMV service demands?
    - Will rural areas retain the need for traditional services longer than urban ones?

Private and Protected

DMVs focus on safeguarding personal data amid privacy concerns

If phone or app-based ID systems do not attain popularity or political backing...

- Will customers and other stakeholders (e.g., law enforcement) insist on hard copy products and records, like licenses, IDs, titles, and plates?
  - How can security features on license cards continue to evolve after Real ID?
  - Could license plates be modernized to prevent tampering or falsification?
  - How can DMV products communicate modernity while remaining physical?

If customers, politicians, and the media become concerned about DMV personal data...

- Will a highly-public breach or failure at one DMV impact public perception?
- Will DMVs come under pressure to publicly defend their data management practice?
  - Can DMVs transition to USB security keys, two-factor authentication, biometrics, or other replacements for passwords?
  - Can DMVs assure the public that data security protocols are in place?
  - Can DMVs migrating to the cloud for DMV data storage convince the public that data security protocols will be effectively and safely managed by a third party?
  - Can DMVs develop "terms-of-use" in the style of technology companies?
  - Can DMVs publicly document requests for driving records?
- Will DMVs face pressure to justify their data storage approach?
  - Can DMVs protect data stored outside the US and justify that choice?
  - Could DMVs be pressured to abandon the cloud and return to mainframe storage?
- Will DMVs need to hire new skills or reconceive of their mission?
  - Can DMVs seek additional funds to hire qualified data security staff?
  - Can DMVs be restructured to focus on a data management mission and vision?
  - Can personal data be housed elsewhere in State/Provincial government?
  - Can DOTs or State/Provincial governments standardize their IT platforms?

If privacy concerns and laws are prominent in society...

- Will DMVs need to justify sharing personal data with other agencies?
- Will DMVs need to become involved or interested in the crafting of privacy legislation?

Demographic Traffic

Diverging preferences among customers lead DMVs to focus on excellent service

If DMVs continue and grow in their role as the "front door" of States/Provinces...

- Can increased online transactions allow for less-dense, comfortable, calming offices?
    - Can DMVs actively inform customers in using online services at kiosks?
- Will States and Provinces see an opportunity to co-locate services?
    - Can DMV offices also distribute transit passes or house utility service desks?
    - Can DMVs participate in single-point payment schemes that combine both public and private services such as tolling, parking, transit, etc.?
    - Can DMVs establish links between their online portals and those of other public and private services relevant to new arrivals (e.g., healthcare, utilities)?

If seniors remain in the workforce and in the driving public longer than in the past...

- Will DMVs need to develop new medical, mental health, and counseling competencies?
    - Can DMVs seek and hire experts in aging to support senior drivers?
    - Can DMVs rebuild senior driver management teams around medical expertise?
    - Can DMVs provide or recommend counseling support for seniors deciding whether to continue to drive and families helping them with that decision?
    - Can DMVs train seniors to use transit, van services, and/or rideshare?
- Will DMVs face pressure to limit online transactions or provide alternatives?
    - Can DMVs partner with senior centers to host kiosks for online transactions and support them with trained assistants (constantly or on a scheduled basis)?

If younger drivers continue to acquire licenses (either to drive or for general ID)...

- Will DMVs see diverging customer service demands, with older drivers and new arrivals seeking more interpersonal support and younger drivers seeking online services?
    - Can DMVs track the demographics of the customer base at each location?
    - Can DMVs vary the retail experience based on the demographics of communities and regions across the State/Province?
    - Can DMVs pursue involved branding projects to ensure that in-person, hard copy, and online/digital experiences maintain the same modern, friendly, and accessible look and feel?
- Can DMVs offer general ID services through schools and youth programs, with in-person, multilingual support to ensure that youth have the benefit of identification?

4 Implementation

As discussed in Chapter 1, this study follows the structure of explorative scenario planning. Specifically, this project identified trends and the pathways they have taken over the past decade and could take in the coming decade, now in light of COVID-19. The project then identified plausible thematic futures that provided food-for-thought questions. Finally, the project discussed some through-cutting questions in more detail, with a focus on the people involved in DMVs: customers and employees.

The next step in an explorative scenario plan would be to develop strategies that are robust, i.e., strategies that are appropriate or helpful in a wide range of plausible futures. The most effective of these strategies can then be built out into a detailed road map for change in each DMV. Some of these may be based on ideas discussed in Chapter 2 – Distance-Forward service, team collaboration software, or identity verification techniques. Others may be identified by agencies' own exploration or by future research.

This research has been successful if it serves as a point-of-reference for DMVs in developing road maps for their post-COVID decade.

This research can be implemented by agencies referring back to trends and plausible futures when mapping their post-COVID evolution. Does a particular strategy, action, or initiative work in a future that focuses on automation, convenience, and remote service as well as it does in a future where highly-public information security incidents at DMVs have impacted public trust? Does an initiative to make services more accessible for customers in their teens become more or less relevant if those teens revert to keeping cars at arm's length as they did in the last recession? COVID-19 has already changed the path of some of the trends in this project (e.g., REAL ID has been delayed, close-range interpersonal service has become unsafe), and it is therefore critical to keep refining observations and expectations in the months and years ahead. Furthermore, COVID-19 has illustrated the value of business continuity for organizations of all types, and strategic planning can identify critical functions and ensure key operations in disrupted times. Finally, COVID-19 has amplified or accelerated some trends that were already emerging.

Readers should take the following observations away from this research:

- DMVs may emerge from COVID-19 with significant permanent changes to operations, protocols, and practices.

- Remote service and work can be more efficient than legacy approaches.

- Even independent of COVID-19, DMVs should have support for modernizing internal operations (e.g., service delivery, data governance, privacy, and employee roles and skills) to retain credibility as guardians of driver credentialing and PII.

- DMVs may need new skillsets at their disposal (acquired through hiring or training) to manage digital information systems, remote service, electronic/digital products, and automation.

The shifts described in this research will require substantial changes in how DMVs do business. Behavioral science tells us that habits are easiest to change during periods of flux; "habit discontinuity," or the

disruption of existing ways of doing things, is a key "trigger" for behavior change and a primary feature of the COVID-19 pandemic for DMV customers and employees across the board.[38] Traditional organizational change models (e.g., ADKAR6) lay out a detailed process, but some basic principles may be helpful:

Message — Articulate the reason that you are exploring change. Why is the new approach important for your organization relative to the old way of doing things? What will you hope to achieve? Use simple language and make it active and positive. Be succinct – you should be able to explain this in one paragraph of text.

People — Think about the people in your organization or standing committees who will be impacted by the change. Employees might see a drastic change in their day-to-day responsibilities. Other agencies may need to take on, handoff, or become more collaborative in their responsibilities as DMVs' roles shift. Think about how these groups might be convinced that the change is necessary.

Communicators — These people will understand the value of change and be willing and able champions and salespeople. They will be the ones to implement the communication plan.

Methods — Most projects wish they had communicated more and earlier. Use emails, phone calls, in-person meetings, newsletters, and other methods of communication to distribute the message. One contact is never enough. It usually takes five to seven messages for your message to sink in. Consider the best time to send messages to a target group and the ways in which they prefer receiving information – face-to-face is usually best. Methods of delivery include:

- Newsletters, fact sheets, and emails
- Face-to-face meetings
- Posters and social media flyers
- Testimonials
- Brown bag lunches and training
- Town halls and social events
- Giveaways
- Intranet landing page postings

Plan — Align the message, people, communicators, methods, and frequency. Write them into a plan that answers questions such as:

- Who is responsible for developing the communication? They should have some familiarity with the target audience.
- Who has good communication and messaging skills who can review the message?
- Who is the preferred sender for each audience? Who is trusted and has credibility with this target audience?

Implementation — Change is about forming new habits. Forming habits takes time. For this reason, it is best to start advertising the change early and presenting the value of the change as it is realized – if your process is producing attractive deliverables and wins, make sure you let people know.

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[38] Elspeth Kirkman, "Free riding or discounted riding? How the framing of a bike share offer impacts offer-reception." *Journal of Behavioral Public Administration*, 2019. https://journal-bpa.org/index.php/jbpa/article/view/83

Appendix A | Interview Guide (November 2019)

Introduction

Thank you so much for participating in the Transportation Research Board (TRB) and American Association of Motor Vehicle Administrators project to identify and assess trends impacting the DMV of the future! Our work is based on our understanding that the DMV is at a crossroads. The mission of most DMVs has been to process transactions involving credentialing for drivers, registration for vehicles, and processing of fees and fines. The use of licenses as official Government identification, however, combined with new technology and security concerns, has led to the DMV being increasingly tasked with critical societal responsibilities that require new expertise from its employees, as well as new technical tools and capabilities for the agencies. At the same time, demographic change (e.g., an aging population) and new concepts of mobility promise the need for further reinvention of the DMV's mission in the years ahead.

The structure of our study is *scenario planning.* Scenario planning integrates our understanding that the future is uncertain by first defining a question (what we are studying, for whom, and why), then assessing trends and their potential paths forward in coming years, and finally weaving those pathways into plausible futures that allow us to strategize to satisfy as many of those plausible futures as possible.

During our interview, we hope to gain insight for all of the steps:

- *Question |* We know that the subject of our study is DMVs, but we also understand that many states and provinces assign "DMV" functions across multiple agencies. Our goal from our own research and from these interviews is to define a list of key DMV functions shared by all or nearly all of the states' and provinces' motor vehicle administrators (even if they are in multiple organizations).

- *Trends and Pathways |* Trends can be societal (demographics, technology, economics), local (governmental/oversight changes, organizational continuity and talent retention/loss), or contextual (Federal requests and requirements). We're interested in hearing what trends you anticipate, free of any bias from research we've already done. Futurist theorizing is not nearly as helpful as hearing the real world insights, concerns, hopes, and fears of the people who conduct organizational strategy for DMVs every day.

Questions

Please keep in mind that these questions are only a framework for what we hope will be a free-form conversation. We may also ask to follow up in writing if we don't get to all of them during the call.

Your Organization and Its Functions

- What is the name of your organization? Where is it situated in the state/provincial org chart (e.g., which cabinet secretary/minister do you report to?

- Does your organization have responsibility for managing:

  - Personal driver licensure?

- Commercial/specialized operator licensure?
- ID issuance separate from driver licensure?
- Voter registration?
- Issues of immigration status or legal presence?
- Registration of personal vehicles?
- Registration of commercial vehicles? Trucks? Buses?
- Registration of bicycles or other types of vehicles?
- Specialized registration for alternative fuel or shared mobility vehicles?
- Collection and accounting of registration fees?
- Collection and accounting of traffic fines?
- Collection and accounting of administrative fines?

- For any of the above not in your agency's purview, is there another organization in your state/province that has responsibility? How is it situated? Do you collaborate?

- Does your organization manage any of the following types of data, and if so, how?

  - Personally-identifiable information (e.g., address, birth date, SSN)
  - Financial information (e.g., credit card number, bank account number)
  - Records for payments and invoices
  - Driving or criminal records, including those forwarded from other jurisdictions

Known Trends

- How do you see each of the following impacting your organization, if at all:

  - The DMV's role as a "front door" to State Government for new arrivals?
  - A need for additional foreign language services?
  - Gradual population shift toward urban areas from less-urban ones?
  - Generational preferences ("Baby Boomers", "Millennials")?
  - A need/demand for documenting legal presence in the United States?
  - A need/demand for registering voters and managing voter records?
  - A need/demand for primary identification, as opposed to driver licensure?
  - New mobility options, such as Uber/Lyft, bikeshare, scootershare, etc.?
  - A need/demand for new information security standards and technology?
  - Connected, autonomous, and alternative-fuel vehicles?
  - A need/demand for online transaction services?
  - Changes in the service and commercial driving labor pool?

Sum-Up

- How does your organization measure productivity and success?

- What are your biggest obstacles to success? How do you see these obstacles evolving in the next 5-10 years (e.g., worsening, easing, or remaining on their current trajectory)?

- What are your biggest opportunities for greater results? What does your organization hope to do to take advantage of these opportunities in the next 5-10 years?

- What keeps you up at night? Your boss? Your direct reports?

- Is there a trend that you know will make a big impact on your organization's ability to succeed?

    - ...that you want to learn more about?

    - ...that you're worried we will overlook?

Appendix B | COVID-19 Workshop Summary (May 2020)

Overview and Objectives

The project team recognized a need to better understand how the COVID-19 pandemic could impact services provided by DMVs. As such, team developed an enhanced version of the traditional Panel Conference to accommodate this discussion through a virtual workshop. The eleven participants included both the Panel and heads of AAMVA member agencies that participated in outreach interviews.

Format and Agenda

The workshop began with a short presentation by the project team that identified several COVID-19 implications and strategies gathered through preliminary research:

- *Implication |* Need for digitization of services.
    - New challenges in driver testing and training – and an acute need to license more commercial drivers – may spur new practices in this arena.
    - The REAL ID deadline has been delayed for one year due to COVID-19, and ongoing efforts aim to streamline document submission to allow for electronic submission.
    - Agencies are proactively encouraging customers to move to online transactions when possible.
- *Implication |* Potential for decreased revenues.
    - Revenue streams from licensing and registration fees may drop, leading to budget shortfalls.
- *Strategy |* Moving ever-more services online.
    - Online document submission or validation.
    - Off-site photos and eye tests.
    - Helps with budget issues by ensuring that customers can pay for services.
- *Strategy |* On-site crowd management.
    - Limited capacity in DMV offices and associated waiting areas/lines.
    - Potential for AI-based solutions to predict or track load characteristics.

This content provided a jumping-off point for a discussion moderated through a shared Google Sheets page, where participants could collaboratively edit a spreadsheet in real time. The workshop was split into the following two sections, each 25 minutes:

- *Implications |* This section was designed to identify the range of anticipated COVID-related issues as well as the priority issues and timeframes for addressing them. Participants were asked to use the Google Sheet to list up to six anticipated implications the COVID-19 pandemic. They spent 10 minutes drafting their initial list and another two selecting the top three most important of that list. The final section on the sheet asked participants to place their top implications on a timeline, identifying it as one that would have impacts anywhere from "immediately" to "two years from now."

- *Strategies* | This section was designed to identify approaches to address the implications highlighted in the previous section. As in the previous section, participants spent 10 minutes initially identifying up to six strategies, prioritizing them, and then placing their top strategies on a timeline.

Key Takeaways

Participants all recognized that DMVs would very likely permanently change how they do business as a result of COVID-19. There were several common threads that ran through comments:

- One participant described a "seismic change" in how offices do business. This period is providing an opportunity to create a "new normal" within organizations. Priorities are now more focused on digital services and streamlining customer flows. Many of these changes will endure after COVID-19.

- This new normal has affected DMV staff differently. At headquarters, for example, one DMV is seeing that staff have more time to catch up on overdue tasks. In virtual field offices, staff who work primarily to face-to-face tasks are now tasked with more back end efforts. Some DMV workers will shift towards more remote work in the longer term.

- An interesting idea raised by a DMV: rethinking what a "transaction" really is. When a customer comes in for a drivers' license, the transaction itself may be six different steps. Can this be broken up, with some done remotely? In the future, will offices only be used for services that cannot be done online?

- Certain technologies have taken on added importance - for example, facial authentication. In ONE DMV, the only real limits to what can be accomplished remotely are federal requirements. All else at state level can be accomplished through facial authentication.