IDAHO TRANSPORTATION DEPARTMENT

RESEARCH REPORT

Idaho DMV Customer Web Portal Study

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16. Abstract This research study looks at potential enhancements to Idaho's DMV web portal. Researchers reviewed existing literature to extrapolate potential benefits of e-government services, documented existing DMV services offered by each U.S. state, analyzed current business processes, investigated current laws and practices governing e-signatures for vehicle titles, synthesized previous DMV website customer satisfaction surveys, administered a survey pertaining to utilization of online address changes in other states, developed guidelines for an enhanced customer satisfaction survey, and recommended best practices. Best practice recommendations include continued implementation of online web services, including online duplicate vehicle registration, online filing of sold notices, online scheduling of DMV appointments, DMV service reminders via e-mail or text messages, and a paperless option for vehicle registration and driver's license renewal notices. Potential innovative e-services such as live chat and mobile applications for DMV practice exams are also worth exploring. Additional best practices include implementation of e-signatures for electronic titles and liens, utilization of online address changes with enhanced security measures, and distribution of a mixed-mode customer satisfaction survey that reaches DMV customers not currently using electronic services.			
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Technical Advisory Committee

Each research project is overseen by a technical advisory committee (TAC), which is led by an ITD project sponsor and project manager. The Technical Advisory Committee (TAC) is responsible for monitoring project progress, reviewing deliverables, ensuring that study objective are met, and facilitating implementation of research recommendations, as appropriate. ITD's Research Program Manager appreciates the work of the following TAC members in guiding this research study.

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Table of Contents

List of Tables

List of Figures

Executive Summary

Researchers focused on e-government have consistently demonstrated that government agencies see many benefits from growing their portfolios of online services. Online services improve efficiency, reduce foot traffic at agency offices, lower the number of calls received by agencies, increase customer satisfaction, and generate cost savings. High-quality websites and other online services make the government more accessible to citizens. Developing and implementing online services can be quite expensive, and agencies must strive to build cost-effective systems that meet their needs and those of customers. Implementing effective systems demands careful risk analysis, skilled project management, and the participation of stakeholders that understand the importance of online web services and support expanding their availability. Building on original research and analysis of customer satisfaction survey data, this report examines how the Idaho Transportation Department (ITD) can improve its online services in the coming years. Key findings from each research activity are summarized below.

Our report includes a review of the ITD Business Service Document for the agency's driver services portal. The document describes each process and contains screenshots of every transaction on the ITD web services portal. Based on this review, we conclude that the driver services portal is a robust system which offers multiple payment options and services for drivers and numerous functions that help administrators monitor driving records, licenses, and insurance status.

Our research team reviewed motor vehicle agency websites for each U.S. state to determine the availability of 78 services in three categories (driver licensing, vehicle titling and registration, and motor carriers). Based on our findings, we identified online services that ITD could add to its offerings to improve customer satisfaction and preserve valuable agency resources. Key services ITD will benefit from adopting include:

- Online duplicate vehicle registration,
- Online filing of sold notices to customers,
- Online scheduling of DMV appointments,
- DMV service reminders via email or text message, and
- A paperless option for vehicle registration and driver's license renewal notices.

We also identified five innovative services Idaho could add to their web services: live chat, mobile applications for the DMV practice exam, vehicle registration renewal, appointment scheduling, and a DMV office locator.

State DMVs have only recently started to use e-signature technologies despite there being a well-established practice in other business environments. Federal and state laws require wet signatures on documents, including odometer readings and vehicle sales contracts. However, jurisdictions are now introducing e-signatures into motor vehicle agency workflows. States are responsible for determining which technologies best fit their budget and best protect the authenticity of documents. Research shows that PKI technologies are the most secure and least likely to be in the case of breach of contract.

To understand the ways in which motor vehicle agencies around the U.S. are integrating online services into business operations, our team prepared a survey which contained 13 multiple-choice and open-ended questions that was distributed via the American Association of Motor Vehicle Administrators (AAMVA) website to all 50 states. Twenty-two states submitted a response (a 44 percent response rate). With respect to developing online system components, the survey revealed a preference for a combination of internal and external developers. However, a clear majority of agencies use third-party vendors to develop payment engines, while most states rely on internal resources for maintenance. Most agencies currently lack a mobile phone app, but many have mobile-friendly websites that can be accessed via the most common browsers on iOS and Android. Over half of states use general budget appropriations in conjunction with user fees generated from the transactions to fund online web services. Some respondents offered insights into future services their agencies are planning on or are currently implementing (e.g., redesigning and modernizing websites, expanding online services, building citizen dashboards, adopting virtual customer assistants).

Another focal point of the study is the routine customer surveys ITD has conducted since 2011 on satisfaction with online DMV services. We analyzed survey responses from January 2011 to June 2019. Over this period, the percentage of ITD customers who visit the website once a year has steadily increased and leveled off around 30 percent. The most frequently used services were online vehicle registration renewal, obtaining forms and applications, locating DMV offices, and downloading handbooks. Regarding the availability of information, customers have given overwhelmingly positive reviews, although negative perceptions increased gradually over the eight-year period. The percentage of customers indicating a strong level of satisfaction has fallen, while the number of people reporting strong dissatisfaction increased. The steady climb in negative opinions may reflect rising user expectations for online services.

Our research team also administered a survey about online address changes. The survey consisted of seven multiple-choice and open-ended questions and was distributed via the AAMVA website to all 50 states and 13 Canadian provinces and territories. We received 25 responses. The survey found that jurisdictions are most likely to offer online address change for driver services and motor vehicle services, while a smaller percentage offer online address change for motor carriers. Most jurisdictions do not require applicants to submit proof of address for online address changes. A majority of jurisdictions employ security mechanisms to detect fraud, including two-step verification, controlling the type of addresses that can be changed online, address verification through United States Postal Service CASS software, and security questions. Usage statistics from one jurisdiction (Virginia) indicate that online address change services are heavily used by customers and present cost savings opportunities.

Finally, our team reviewed research on customer satisfaction surveys to determine how ITD can improve its research methodologies and administer surveys which deliver the information it needs to enhance its services. We recommend that DMV administrators explore adopting a mixed-mode survey to supplement current online survey efforts. A mixed-mode survey attempts to reach respondents via multiple different survey modes (e.g., online, phone, mail, in-person). Using a mixed mode survey will reduce survey error and provide insights into the attitudes and behaviors of different customer bases. Survey development should adhere to best practices for question design and wording, formatting, content and length. The

report contains additional documentation on appropriate procedures and suggestions for long-term strategic planning.

Chapter 1
Literature Review

Introduction

E-government is an expansive concept that encompasses myriad technologies, which electronically connect government agencies at different levels with constituents. Those government agencies that have adopted e-government use Information and Communication Technology (ICT) to interact with customers via the internet, wide area networks, and mobile applications to conduct business with citizens, businesses, and other stakeholders in governance (Alomod and Shafi, 2009). E-government has four main groups of stakeholders: employees, the public, businesses, and other government agencies (Twizeyimana and Andersson, 2019). Governments are transitioning to more web-based services to improve the customer experience, increase efficiency, encourage transparency, and decrease the costs of running government agencies (Alomod and Shafi, 2009). According to the United Nations (U.N.), the most common services are online payment for utilities, paying and filing income tax returns, and registering businesses (Zhenmin, 2018).

The U.N. produces a biennial publication called the *U.N. E-Government Survey* that includes an e-participation index that measures the extent to which e-government ICT has been deployed throughout the world. The survey identifies tools countries can use to implement e-government technologies. Not surprisingly, there is a direct correlation between the level of economic development and the maturity of a country's e-government. While almost all countries have implemented some form of e-government, less-developed countries consistently score low on the U.N. E-Government Rankings Countries. The top 10 countries are Denmark, Australia, the Republic of Korea, the United Kingdom, Sweden, Finland, Singapore, New Zealand, France, and Japan.

The U.N. notes that the speed at which new technologies are being developed is much faster than the speed at which governments can integrate them into the ICT systems. Since many countries now offer an array of online services to their customers, governments must identify ways to build resilient and sustainable infrastructure and integrate these new technologies into ICTs. The U.N. notes that countries must work to protect ICT from malware and ransomware attacks and improve network security. This requires the countries to provide better training to government employees. Cybersecurity is integral to this effort. The U.N. argues that countries should develop regional and international standards for cybersecurity.

E-Government

Public agencies have multiple missions, which makes it difficult to reach optimal efficiency even with efforts to improve infrastructure within their operations (Karwan and Markland, 2006). Deficits force agencies to do more with less while striving to meet the needs of their customer base (Karwan and Markland, 2006). The literature on e-government often cites many benefits in adopting e-government

services. These benefits accrue to both customers and government agencies. Proponents of e-government say these tools improve workflow efficiency and decrease costs to government agencies (Ariton-Gelan, 2015; Catana & Catana, 2009; Paroški, Konjović, Surla, & Popović, 2015). E-government also helps citizens submit applications, obtain licenses, pay bills, file taxes, and provide documentation for various purposes (Bussell, 2011; Hodos, 2014; Pocora et al., 2011).

E-government also improves tax collection, because agencies can process returns in shorter amounts of time. This also means that compliance improves (Edmiston, 2003; HodoŞ, 2014; Jannat, 2010). The most commonly cited benefit of e-government is time savings for the customer and agency. Edmiston (2003) found time savings is a major benefit of e-government, particularly in vehicle- and driver-license-related processes (Edmiston, 2003).

Challenges for Implementing E-Government

The literature on e-government also includes caveats that should be kept in mind when building sustainable e-government systems. Scholars caution states to consider ways in which e-government efforts can be derailed. Many states are taking older systems and trying to meld them with new systems and infrastructure (Karwan and Markland, 2006). As Karwan and Markland (2006) argue, this may not result in measurable savings or improvements in efficiency. In addition, these types of changes may need additional personnel or an upgrade in infrastructure (Karwan and Markland, 2006).

Another lesson for states attempting IT systems upgrades is that systems need to be dynamic and designed for additional upgrades (Ariton-Gelan, 2015; Jannat, 2010). Dynamic, sustainable systems require adequate long-term funding (Catana & Catana, 2009) as well as well-trained staff members knowledgeable in creating and maintaining the system (Jannat, 2010; Paroški et al., 2015). Protecting the system against security risks is another consideration, especially given that governments have access to a significant amount of personally identifiable information (Ariton-Gelan, 2015; Kreps & Richardson, 2007).

E-government also presents financial challenges that delay many of the often-touted benefits as well. It can be expensive to develop, deploy, and maintain (Jannat, 2010), which prevents many agencies from transitioning to e-government applications (Edmiston, 2003). Monetary savings may not appear during the initial stages of implementation. The time savings may not be immediately apparent, as states may have to offer both online and paper options for conducting business during the transition period. In addition, priorities set by decision makers can impede the speed of implementation, which may delay or even halt the adoption of electronic services (Bussell, 2011).

States can avoid such pitfalls through careful project management. Careful vendor procurement and skilled project management are key to adopting e-government processes which remain on budget, on schedule, and meet the stakeholder needs (Fisher & Bradford, 2006; Paroški, Konjović, Surla, & Popović, 2015; Kreps and Richardson, 2007). It is important to build risk management assessment into driver license and vehicle registration system upgrades. Not doing so has led to the scrapping of many costly projects, such as a $44 million project in California that never came to fruition in the early 1990s. In this case, the state had an aging system that it attempted to update ("Throwing the dice: California learns the

hard way," 1997). In the end, the motor vehicle agency wound up with a system that did not function. The system database had hardware but no operating system application for the database to function ("Throwing the dice: California learns the hard way," 1997). While this is a dated example, it still holds valuable lessons for other states wanting to upgrade their mainframe system. States must have a reliable funding source, managers experienced at guiding projects for large public agencies, and be able to invest the resources necessary to conduct a thorough analysis of whether a particular solution is the best technological solution for the agency ("Throwing the dice: California learns the hard way," 1997).

While the e-government literature shows automation can save time, money, and add efficiency to government agencies, it also discusses obstacles to successful implementation. Automation is an expensive undertaking. Financial savings may not materialize during the first phase of implementation. Savings generally accrue over time. Second, states need to reprioritize funding to ensure there is enough money to create a robust, dynamic system that can be updated easily as necessary.

Websites as E-Government Tools

Researchers have also written extensively about websites as e-government tools. This literature generally focuses on the evolution of government websites and best practices for developing and maintaining websites.

Current e-government literature generally focuses on the context of the Web 2.0 era which refers to the transition of the internet from a tool that people use to search for information to an interactive tool where people can create, share, and collaborate on content using web-based application (Shrivastav and John, 2014). In Web 2.0, users are interact with web services and applications as opposed to simply gathering information. Examples of Web 2.0 applications include wikis, blogs, podcasts, social media (e.g., Facebook and Twitter, Spotify, Skype, YouTube), and document creation tools such as Google Docs. Web 2.0 is participatory. In terms of e-government, Web 2.0 allows governments to interact with constituents.

Scholars and experts on e-government use the term maturity to describe the evolution of government websites. Their timelines generally begin in 1995 and extend to the present, although clearly not all governments are in the same stages of development. In addition, governments may have adopted practices from some stages but not others.

In the first stage, government websites have a rudimentary purpose of establishing a presence and providing basic information (Davies 2015; Alomod and Shafi, 2009; Cisco, 2002). Websites generally include information about government agencies. In the second stage, users gain the ability to download documents and forms. Links embedded on sites direct users to other sections of the site as well as the homepage. In the third stage, users can complete transactions online, have the ability to complete and submit forms online, and can maintain an editable profile. In some cases, users can obtain certificates online. Website security also improves during this stage. Developers implement functions to protect personally identifiable information (PII) and regularly test site security. In the fourth and final stage, the website is built around customer needs (i.e. people-centric). There is also deeper integration with other government agencies. Ideally, in this stage, the homepage is intuitive and customers can locate individual

services in three clicks or less. During this stage, interaction increases through applications such as live chat. Website developers also seek customer input to improve the service experience. In addition, developers are catering the site to groups with unique needs, such as improving accessibility for the disabled community.

Figure 1 shows the maturity stages and the increasing level of technological sophistication and service options.

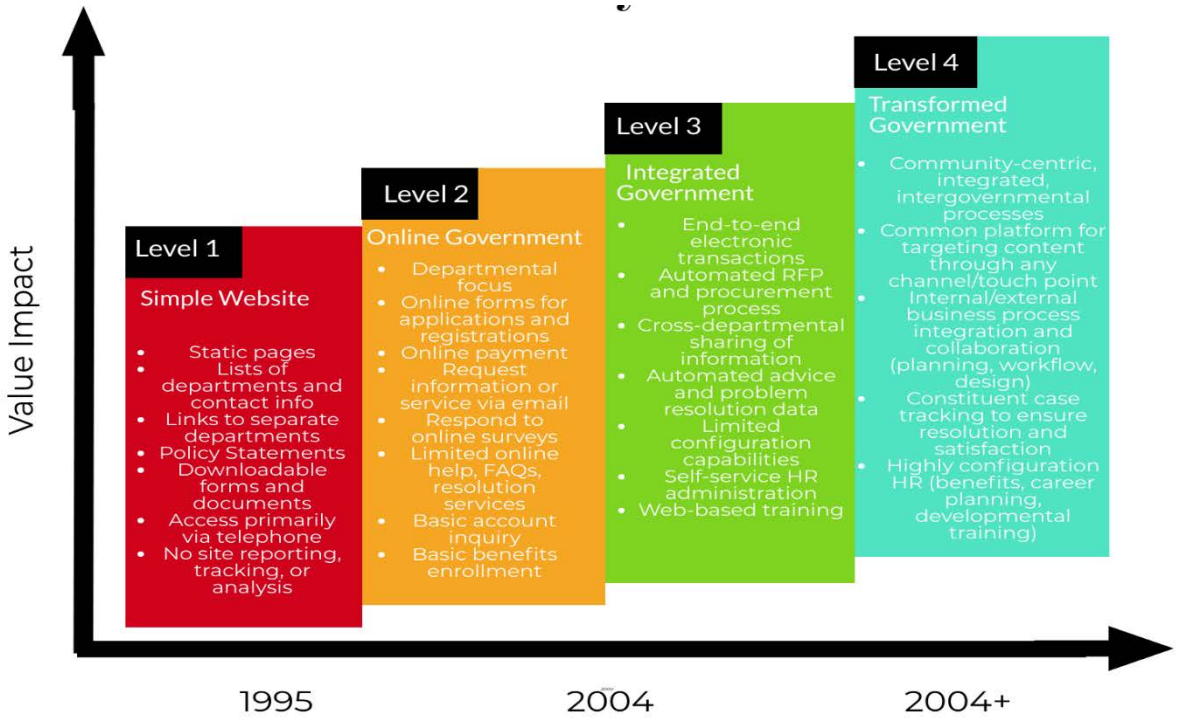

Figure 1. E-Government Maturity Model

Much of the literature on e-government discusses best practices for deploying ICTs, particularly with respect to the importance of a quality website that citizens find easy to use. Improving accessibility and participation are also key themes in this body of literature, which also has catalogued best practices to help guide governments through developing, expanding, and maintaining e-government websites. In addition, the best practices literature provides guidance on increasing the number of citizens using agency web-based services.

Websites are an important way in which the public interacts with their government. Citizens are often unfamiliar with the agencies and governmental procedures (Western Australia State Office of the Auditor General, 2016). The state website serves as a gateway that allows citizens to navigate the inner workings of local, state, and federal agencies. It is imperative for governments to employ quality user-friendly websites. In 2016, Western Australia (WA) administrators evaluated their state's website. By comparing

their website to the websites of other governments, WA found it did not meet best practices standards. The search function took too long and did not produce dependable results, making it difficult for citizens to locate needed information. In addition, they found the site lacked intuitive navigation and was poorly organized.

The Australian study put forward important best practices. Government leaders must prioritize developing and maintaining government websites to ensure buy-in from all agencies. Government agencies are resistant to adopting new policies and procedures. Not only is there a cost associated with developing and maintaining systems, statutory and administrative changes are generally required as well (Western Australia Office of the Auditor General, 2016). In addition, agencies must solicit input from all stakeholders and cooperating agencies when developing policies. Governments should move beyond simply providing forms for customers to print and submit in person — they should create an environment where those forms are completed online (Western Australia Office of the Auditor General, 2016). In addition, governments need to ensure their sites comply with the Web Content Accessibility Guidelines (WCAG) 2.1. This document was created by the World Wide Web Consortium (W3C) process, which develops web standards to increase accessibility for people with disabilities. Alomod and Shafi (2009) argue that one of the most important indicators of a quality website is whether users can access services 24 hours a day, 7 days a week and its level of accessibility to a wide audience.

Government websites are expensive to develop, and unfortunately citizens do not always utilize the online services to the extent anticipated. Given the abundant evidence that online services reduce costs, improve efficiency, and improve customer satisfaction, it is imperative that governments determine why citizens are not using their websites. With that in mind, best practices literature on government websites addresses the question of why citizens do not use websites and how they can improve site traffic.

Building trust is a recurring theme in the e-government literature. While conducting research on citizen trust and e-government services, Chee-Wee, Benbasat, and Cenfetelli (2008) found that some citizens do not trust websites, a phenomenon they termed *transactional uncertainty*. Transactional uncertainty prompts some individuals to choose in-person visits at government agencies because they place more trust in face-to-face interactions (Chee-Wee, Benbasat, and Cenfetelli, 2008). Some customers also harbor uncertainty over whether government agencies protect the information exchanged during online transactions. Chee-Wee, Benbasat, and Cenfetelli (2008) argue that reducing transactional uncertainty and building trust will encourage customers to use online services. They further argue that reliable, efficient, and user-friendly websites will help build trust with customers and increase the use of online services.

E-government should help to close the communication gap between citizens and government agencies by increasing mutual engagement (Alomod and Shafi, 2009), which can help to build trust with the public (Twizeyimana and Andersson 2019). Lee-Geiller and Lee (2019) note that surveys show that less than 50 percent of citizens trust their government. Government websites increase transparency by making public records, proceedings, and decision-making processes (Lee-Geiller and Lee, 2019). Public access to these records can mitigate or prevent issues such as bribery and fraud in government agencies.

The literature on best practices also discusses the digital divide. The 2018 U.N. survey notes that while many countries use their ICT to help address the needs of marginalized populations (e.g., people living in poverty, the elderly, the disabled) there is still a persistent digital divide — some people can access and use government websites while others do not. The UN says these people have been left behind. However, according to Lee and Proumbescu (2019) the digital divide does not just refer to people lacking access to internet technology. Indeed, mobile technologies have increased access to the internet worldwide. The digital divide also refers to whether certain populations can actually use those tools (Lee and Proumbescu, 2019). Karaim and Inal (2019) published a study based on the evaluation of 10 government websites to determine how accessible and useable they are for disabled citizens. They found that accessibility is a common problem for government websites. Given that individuals with mobility issues or other disabilities benefit from the convenience of online services, this is an issue that governments need to address (Karaim and Inal, 2019). The authors of the study recommend governments use the Webcontent Accessibility Guidelines to create websites that meet the needs of disabled citizens.

If a citizen does not feel confident in accessing and successfully completing a transaction on a government website, they will not use these tools. Lee and Proumbescue (2019) found that while the elderly and disabled are the most likely to benefit from the convenience of online services, they are the least likely to use those services. Based on research conducted in South Korea, Lee and Proumbescue (2019) concluded that governments should also provide training to citizens that teaches them how to use government websites and includes hands-on training that helps users feel confident in their abilities to use the services competently.

The best practices literature also discusses the importance of high-quality websites for encouraging citizens to use expensive e-government programs. Huang and Benyoucef (2014) argued citizens are less likely to use services if they do not believe the website is credible or useable. Website usability is compromised when customers have difficulty navigating the site, difficulty understanding and accessing content, the website contains broken links, is difficult to read, or customers are overwhelmed by the design (Martin, 2011; Huang and Benyoucef , 2014). Credibility issues include the inability to locate contact information, lack of a security message, and out-of-date content. Huang and Benyoucef (2014) recommended that government web developers devote their energies to improving website credibility and usability to increase usage.

States should consistently update their websites to increase the number of services and meet customer needs. Government websites should always be evolving to improve services. Research by Serrano-Cinca and Munoz-Soro (2018) developed an innovative technique that governments can use to ensure their services align with the needs of their customers. The authors argue that customer needs can be deduced from the terms customers use in relation to the government's services. Web developers can compare the search terms with the actual services provided by the government (Serrano-Cinca and Munoz-Soro, 2018). In addition, governments should use search engine optimization (SEO) tools to improve the findability of their site (Serrano-Cinca and Munoz-Soro, 2018). Governments should try to ensure that their websites are positioned high in search engines like Google. A website has more authority and thus more credibility if it is prominently listed in search results (Serrano-Cinca and Munoz-Soro, 2018). When governments are evaluating the quality of their services, they should add SEO performance indicators to the evaluation rubric. To increase the SEO position, governments should expand the number of pages on their sites to

increase the number of backlinks, or links from other websites that direct users to your site (Serrano-Cinca and Munoz-Soro, 2018).

Finally, governments will benefit from reconceptualizing the relationship with citizens who use online services. Lee-Geiller and Lee (2019) argued that governments should use e-government tools for engagement as well as delivering services. E-government tools are often developed from the perspective of the government as opposed to the needs of the citizens (Lee-Geiller and Lee, 2019). Websites and portals are simply tools for administration rather than engagement with the public (Lee-Geiller and Lee, 2019). Social media platforms such as Facebook let governments interact more with their constituents. In this mode of communication, constituents can give feedback in real time on the quality of government services and provide input on the services they would like to see from the agency.

Improving Customer Satisfaction Using Online Services and Decreasing Costs

Multiple states have conducted studies and surveys to identify strategies aimed toward improving customer satisfaction at motor vehicle agencies. All three states concluded that introducing more online services would reduce wait times for in-person services and decrease the number of calls to their agency. In addition, state survey responses indicated that citizens wanted more online and mobile application options.

Indiana

Indiana's Bureau of Motor Vehicles (BMV) operates as a branch-only system, which is the most expensive type of interaction model and results in extended waiting times. Indiana's customer service study linked outdated technology to the BMV's long wait times. Therefore, improving technologies was an important step to enhancing customer satisfaction with Indiana's BMV (BMV "Customer Choices" Initiative, 2008; Waddell, 2013).

Lowering wait time was an important goal for Indiana's Customer Choices initiative. To that end, Indiana instituted self-service kiosks in BMV branches to reduce staff workload, hired more call center workers, and added more ICT-related services, which included a smartphone application and a web chat application for communicating with customer service agents.

Indiana's BMV developed targeted processing times for email responses and services such as driver licenses and vehicle registrations. Finally, Indiana implemented and monitored performance measures to determine the success of its BMV's reforms and devised strategies to build on that progress for the future.

Virginia

In 2014, the Virginia legislature mandated a review of customer satisfaction for its DMV. As a result of the review, Virginia determined that increasing the number of online services would improve DMV customer satisfaction. Terry Witt, Customer Service Liaison for Virginia DMC, gave a presentation at 2012 AAMVA Conference outlining the 29 online transaction options — including driver license renewal, vehicle registration, vehicle registration renewal, and various records requests. Instead of mailing renewals to

customers, customers could receive electronic reminders by email and text (Witt, 2012). According to Witt, these alternative services cut down on cost and reduced traffic in their branches.

North Carolina

North Carolina also conducted a study to identify ways to improve its DMV operations. The study's methodology was inspired by the studies in Virginia and Indiana (Thomas 2015 and 2016). Researchers conducted a mixed-method study using employee surveys, customer surveys and case studies from other states (Thomas, 2015, 2016).

Like Indiana and Virginia, North Carolina residents wanted more online service options, which included online renewal options for driver licenses. North Carolina also created an online portal that lets customers see all services available to them along with their personal records and accounts. The portal allows customers to make payments and schedule appointments with the DMV. North Carolina also deployed camera-enabled kiosks in multiple places (e.g., malls), which allows people to renew and replace their driver licenses.

However, all three case studies illustrated that customers may not always use online services when they are available. One study found that people will still visit the DMV in person even when online options are available and agencies charge walk-in customers to disincentive office visits. Many of those customers continue to make in-person office visits because they can get immediate service and last-minute service (*Assessing the Performance of Virginia's DMV*, 2015; Witt, 2012). This is a problematic scenario because walk-in customers wanting services available online increase the wait time for individuals who need to go to the DMV to obtain a service. To address this problem, Virginia's DMV implemented incentives and promotions to encourage customers to use online services (Witt, 2012). Customer service agents were also trained to promote the new online services to steer customers to those options (Nixon, 2013).

There is empirical evidence that online services lower costs. In 2014, the Kentucky Transportation Center conducted a survey regarding online driver's license renewal. The survey asked respondents to quantify savings that states have accrued from online renewal. Iowa, Indiana, and Virginia all reported savings (Keathley, Martin, and Walton, 2015). Iowa pegged total annual state savings for the Department of Transportation at $1.45 million. In 2012, Indiana estimated savings of $6.50 per transaction and that a branch visit costs three to four times more than online transactions. Virginia's savings were considerably higher than other states. Online renewal created a savings of $3.1 million annually.

Chapter 2
Idaho Transportation Department Business Services

Idaho.gov and Access Idaho

Idaho.gov is the State of Idaho's official government website and is used by businesses and private citizens. The site is funded through user fees, not taxpayer funds, and is governed by an Access Idaho steering committee, which has seven members who provide guidance on policies, operations, and oversee the creation of additional portal services. The committee meets on the fourth Thursday of each month, where a representative from the portal contractor Access Idaho provides an update on current and future projects. Committee members also vote on any matters related to current projects. The current committee is comprised of representatives from the Governor's Office of Information Technology Services, the Secretary of State's Office, Idaho Transportation Department, the Department of Health and Welfare, and the Idaho Information Consortium General Manager of the Access Idaho Portal. The committee is also responsible for establishing priorities and monitoring service fees.

Access Idaho is Idaho's website portal is managed by the Idaho Information Consortium (IIC), which won a bid following the Request for Proposal (RFP) in 1999. Access Idaho develops and maintains online applications and payment services for multiple government agencies, counties, cities, school districts, and utility districts. The state goals for Access Idaho are very similar to the goals highlighted in the literature on e-government. Access Idaho aims to improve efficiency, decrease the amount of time needed to complete government processes, and reduce costs for government as well as businesses and citizens. Access Idaho has 14 employees and operates on a self-funded model that does not require direct taxpayer funding, instead generating revenue through transaction fees. IIC is a subsidiary of NIC which is a publicly traded company that provides multiple e-government services such as websites, develops mobile platforms for e-government, and processes payments. NIC provides service for both federal and state agencies, and it is the largest e-government service provider.

Since the development of Access Idaho, the portal has expanded to offer 293 online services, has 336 government partners, and has processed 8 million secure transactions and seen 50,000 mobile application downloads. In addition, it has won 15 awards. According to the Access Idaho site, the IIC has saved Idaho over $50 million since it took over the development, expansion, and maintenance of Idaho.gov. The self-funded model ensures there is plenty of funding for developing and offering new services to Idaho customers. Since the system is funded through service fees, encouraging people to use online services is paramount to ensuring the expansion and sustainability of the Access Idaho portal.

Access Idaho is self-funded through user fees. These fees are used to pay for the cost of developing and maintaining Idaho's e-government platform. The funding also enables Access Idaho to increase the number of e-government services offered. This funding model has been used with success for the past 20

years. Access Idaho also publishes a quarterly newsletter on its website to inform citizens about new service offerings and focus on specific government agencies that use Access Idaho applications.

AAMVA Award

In 2016, the Idaho Transportation Department (ITD) was awarded the International and Regional AAMVA Innovative Use of Technology Award. This award recognizes jurisdictions which have "implemented technology tools that directly enhance access to services or the service experience." AAMVA awards one agency in each region and chooses a single winner for the International Award. Selection criteria include technology that improves delivery of service and demonstrates a quantitatively measurable dollar return on investment, staff efficiencies, and/or an increase in the adoption of electronic services. The program must also inspire and provide a model for further innovation.

AAMVA recognized Idaho and Access Idaho for its Online Driver Record Dashboard (DRD). DRD combines Driver's License Record Status and Medical Certification Status services so that businesses can monitor the driving records and medical certification status of their drivers. The subscription service allows companies to build lists of Idaho driver licenses to monitor records for changes. Companies can also purchase driver license records in bulk or by individual license holders using the license number of the employee. The DRD system reviews the licenses on the list twice each month. If the DRD system detects a conviction or suspension, it emails an alert to the company. The system includes expiration dates for driver licenses and commercial driver licenses (CDLs) as well as the medical certification records, which are updated each night. DRD saves companies from the labor-intensive task of checking each driver license and medical certification record individually or having to contact ITD by phone. In addition, it improves safety on the highway because it flags unsafe drivers and helps companies remain compliant with federal regulations such as CDL laws.

The DRD is part of a package of services which can be purchased for $95 a year with an additional $10 per year and a $.28 fee per driver per month. The other services which are available by subscription are Crash Reports, Driver License Records Search, vehicle registration services, and the ability to conduct business with the Secretary of State's office.

ITD Business Services Document

ITD provided researchers with the department's business requirements document — its DMV Customer Profile: Phase 1 Driver Services. It contains a table of contents and a contact list for both Access Idaho and ITD. The document describes each feature in the ITD website as well as a workflow diagram. The workflow diagram visualizes each possible option which can be chosen and the possible scenarios those choices result in. In addition, the document includes screenshots for each customer option available on the site. Each screen provides telephone numbers for Access Idaho in case a customer needs assistance while using the portal.

Idaho offers four options for credit card payment: Mastercard, Visa, Discover, and American Express. At various points during the transaction, customers are invited to take a customer service survey.

The stated goal in the customer profile is to:

"Create a one-stop place where Idaho drivers can update their address, renew/replace their driver's license/ID cards, pay their reinstatement fees, purchase their driving record history, and see the status of their driving privileges."

Description of Online Customer Service Options and Processes

Idaho uses a single sign-on functionality that creates a one-stop-shop environment that customers can access on their phone, tablet, or PC. The single sign-on functionality lets customers use the online services of other agencies, such as the Idaho Secretary of State and the State Tax Commission, among others.

Drivers can:

- Review the status of their driver's license
- Renew their license/ID card
- Obtain a replacement license/ID card
- Pay reinstatement fees
- Update their contact information
- Purchase their driver history record
- Indicate contact preferences
- Use PayPal for fees

Users must set up an Access Idaho account to use the system. The Idaho Application Template is programmed so that the applications will work across PC, phone, and tablet so the state does not have to maintain multiple programs for each platform. The goal was to begin with driver license services and then expand to include vehicle registration applications. The intention was to replicate the renewal-by- mail option, where drivers could renew their documents 25 months before the license expired as well as obtain duplicate licenses.

When expanding the system as part of Phase I, Idaho planned to use the same application program interface (API), which consists of the processes, protocols, and tools that are used to build software applications. Data connected to the Access Idaho username are not stored in Access Idaho. Idaho uses the Globally Unique Identifier (GUID), which is a 128-bit number, to identify information in Microsoft software. The only data that is stored within the system are those is used for transaction receipts to users.

The manual also provides instructions on how customers can set up their ITD profile. When the customer first creates a user profile and logs in for the first time, they have the opportunity to connect their user ID to other applications in Access Idaho. The profile is connected using the customer's last name as listed on their driver's license or ID, the date of birth listed on their driver's license or ID, and their Social Security Number. The business resource document contains a flow chart which lays out the process for setting up an account and connecting it to other Access Idaho accounts.

To create an Access Idaho account, the customer must provide their name, telephone number, and email address, and then create a username as well as password containing specific types of characters to

increase the strength of the password's security. In addition, customers must answer three security questions and submit a CAPTCHA answer as this prevents bots from infiltrating the system. Customers are also required to verify their account by accessing the email provided during the signup process and clicking a link in the email which directs them back to the Access Idaho site, thus confirming account activation. The business resource document includes screenshots of the signup process for Access Idaho.

Viewing and Updating the Profile Page

When customers access their profile page they can see their information, physical address, mailing address, driving privileges, driver's license, identification card, and history. Access Idaho does not store a customer's information; any information in a customer's profile comes from the ITD database. Access Idaho only stores receipt information from transactions. When customers access their profile page, the system provides warnings when a customer's driver's license or ID card is set to expire or has already expired. The system displays a red warning if the credential has already expired and a yellow warning if the credential is within thirty days of the expiration date. If a customer needs to pay a reinstatement fee, the system displays a red warning.

On the My Information Page, customers can edit their email and mobile phone number, as well as indicate how they would like to be contacted. Customers can choose to be contacted by email, phone, or text. However, the Access Idaho portal limits the customer's ability to edit their name online. Customers also have the option to change their mailing and billing addresses, which are verified by the U.S. Postal Service (USPS). If the customer inputs an address the USPS cannot verify, the portal displays a warning box that informs the customer. The customer overrides the system and accepts the original address as it was input or accepts the address suggested by USPS. The system also requires customers to click a box that affirms they provided a correct address. When a customer changes their information, the system updates in real time.

Driving Privileges Page

A customer may access information about their driver's license on the Driving Privileges page. From this page, they can purchase a driving history record, pay reinstatement fees, or check on the status of their driving credential. The page allows both commercial and non-commercial driver license holders to view license status, purchase a copy of their driver history record, and pay reinstatement fees. To protect personally identifiable information, only the last three characters of the license number are displayed on the page.

When drivers purchase a driving record, they must select a reason for their purchase and verify their information and email address. Customers access their record by clicking a link sent via email. Then the customer enters their payment information, at which point they can view their receipt and either sign out of the portal or return to the profile page. ITD charges $9.56 to access a copy of the driver license record (DLR). This includes a $7 charge for the document and a $2.56 service fee. The ITD website only offers three-year DLR. Customers have the option to print their DLR. Customers receive a printable receipt after every transaction.

Customers also have the ability to check their status and pay reinstatement fees if their license is suspended. If they owe multiple fees, they must contact ITD if they only want to pay one fee. The reinstatement fee is $85, which includes a $3.55 additional service fee. The reinstatement fee and the service fee are not refundable. It can take up to two days to process the payment. Customers cannot pay court costs through the website. It is crucial for customers to keep an up-to-date address on file so they can receive correspondence from ITD.

Driver's License and Identification Card

A customer also has the option to renew or purchase a replacement driver's license or an ID card online. This service is only available to customers renewing those documents for four years and whose licenses have not expired. Only U.S. citizens or permanent residents can obtain these documents. The customer cannot make changes to their name and cannot change their license endorsements. Customers are also not permitted to transition from a standard license to a REAL ID-compliant license (the Star Card). Access Idaho uses an API to determine the customer's eligibility to use the service. An API is a form of software testing that acts as an intermediary between two applications. In this case, the API serves as an intermediary between the Access Idaho portal and ITD databases to check what services the customer may access. The Access Idaho system uses a stored digital photograph for the license.

There are separate sections for the driver license and ID card. The customer can choose between renewing a driver's license and purchasing a replacement. The same options are available for the ID card. The process described below applies to the online issuance of a replacement credential. CDL holders in Idaho cannot renew their license online.

Developers of the ITD website intended the online renewal to flow similarly to mail renewal process or an in-person visit to the DMV. Customers verify their name, which is printed on their credential, mailing and physical address, and indicate if they want to donate $2 to an organ donation fund. Each time an individual inputs personal information, the system asks them to select *Yes* or *No* to indicate the information displayed by the system is correct. Once the customer reviews all of the information to confirm that it is correct, the next screen requires them to acknowledge they cannot use the online service to change the endorsement on their license, obtain a READ ID/Star Car, and that they will not be issued a temporary credential during the wait time for their license, which generally takes between 12 to 14 days to arrive in the mail. This step is completed when a box displays that lists each statement. The customer clicks a box next to each statement showing that they understand those conditions for renewing or replacing their credential. Once the customer agrees to these terms, a series of checks are conducted by the system. Those checks include State Pointer Exchange Services (SPEXS) and Problem Driver Pointer System (PDPS).

SPEXS is a centralized national database used by the State-to-State (S2S) verification system that AAMVA supports. It lets state motor vehicle agencies electronically check driver license databases in other states to determine if an individual already has a driver license or ID that was issued in another state. The SPEXS is the platform database that is used by the S2S system to ensure that any individual only has one driver license/ID, provide a means for verifying these credentials, and to check the authenticity of a REAL ID credential.

The PDPS is a platform that stores data for the National Driver Register (NDR). This system stores information about drivers whose driver privileges have been revoked, suspended, cancelled, denied, or who have been convicted of serious traffic-related crimes. The PDPS points the state requesting information about the driver (State of Inquiry) to the state where a driver's history record is maintained (State of Record). When Access Idaho runs a query on the PDPS, they receive five main statuses:

- Match — A driver has a record in the NDR
- No Match — A driver does not have a record in the NDR
- Licensed (LIC) — A problem driver has a valid license
- Eligible (ELG) — The individual is eligible to drive and obtain a license
- Not Eligible (NELG) — The individual does not have driving privileges

While the portal conducts the necessary database checks, Bureau of Vehicle Regulation (BVR) customers confirm they are either citizens or permanent residents by clicking *Yes* or *No* boxes affirming U.S. citizenship or permanent resident status. At this point, license applicants must also sign a Credential Acknowledgement. The Credential Acknowledgement says that the customer acknowledges that Idaho is an implied consent state, which means a driver's license will be administratively suspended if they do not consent to a breathalyzer, blood alcohol test, or urinalysis when requested by a law enforcement officer, if they are suspected of driving under the influence.

When customers submit documents in support of their application, they are scanned, digitally preserved, and retained by ITD. In addition, license applicants must acknowledge that they have to relinquish any out-of-state driver licenses, only possess one driver license, are eligible to drive, and must change their address within 30 days of moving. Applicants must also affirm they are mentally and physically capable of safety operating a vehicle.

Once a customer has signed the Credential Acknowledgement, they are prompted to acknowledge the Sex Offender Registry Act (SORA). The SORA acknowledgement reminds applicants that if they are a registered sex offender and a new resident, they must register with the sheriff in their county of residence within two working days of establishing residence in the state. It provides further information on the penalties associated with not registering as required by Idaho state law.

Once the BVR requirements are complete, the customer arrives on a review page, where they can ensure all of the information input is correct and provide a digital signature once the system checks are complete. The customer then inputs their payment information, at which point the customer will receive a receipt by email. The license renewal costs $31.90, which includes a $1.90 service fee paid to the vendor. A PDF of the Credential Acknowledgment Form is then sent to the ITD. If the system encounters a problem during the BVR checks, the screen will display a message that explains the error and/or tells the customer to visit a local DMV office.

Each customer profile contains a transaction history section. The history lists the type of transaction, the date the transaction was completed, and the amount of the receipt.

Administrators can run application reports and use tools that let them search transactions connected to specific accounts. Administrators can search by transaction(s) data, identification and license numbers, and customer name. They can also search by the type of service transaction, credential, and payment method. Administrators use these criteria to derive audit reports, batch reports for particular date ranges, reports on credential renewal and replacement, and transaction monitoring. The system also enables administrators to run SR22/26 reports, which are AAMVA functions. An insurance company submits an SR 22 form to confirm a high-risk or problem driver has sufficient insurance coverage. An insurance company submits an SR 26 form when an SR 22 is no longer required for that driver.

Overall, the driver services portal is a robust system that provides several convenient payment options and services to Idaho drivers. The records checks ensure that customers meet all criteria necessary for obtaining drivers licenses and ID cards. The driver services portal also provides a significant number of functions that let administrators monitor driving records, licenses, and insurance status.

Chapter 3
DMV Online Services in the United States

Services of Interest

Our initial charge was to survey the types of online services available through the Division of Motor Vehicles (DMV) or equivalent agency in each U.S. state (except Hawaii). After consulting with the Idaho DMV Technical Advisory Committee, we narrowed down the list of services based on their interests. The online services primarily fall into three categories: driver licensing (Table 1), vehicle titling and registration (Table 1), and motor carriers (Table 2). A total of 67 services were selected for those three categories and 11 more services were categorized separately due to their wide availability regardless of the service category (Table 2).

Table 1. DMV Online Driver and Vehicle Services Provided by U.S. States

Driver Services (23)	**Vehicle Services (30)**
Account/Password/PIN Management (DL)	Account/Password/PIN Management (MVL)
Pre-apply for Driver License/ID	New Vehicle Registration
Driver License/ID Renewal	Pre-apply for Title/Registration
Duplicate Driver License or ID Card	Vehicle Registration Renewal
Convert an Out-of-State License	Duplicate Vehicle Registration
Driver License Status	Renewal Status
Driver License Transaction Status	Temporary Registration
Driver License Reinstatement	License Plate Tab Replacement
Request Reinstatement Letter	Plate Exchange
DMV Practice Test	Vehicle Registration Cancellation
Mobile Application for DMV Practice Test	Refunds
Schedule or Confirm Road Test	Vehicle Records (Title, Registration, Liens)
Pay Road Test Fees	Vehicle Title Application Status
Driving History Records	Vehicle Titling
Handicap Placard Application/Renewal	Duplicate Vehicle Title
Traffic School Online Registration	Filing Accident Reports
Traffic School Completion Check	Purchasing Collision Report
Organ Donor Registration	Insurance Verification/Status
Pay Driver Civil Penalties	Vehicle Insurance Update
Emergency Contact Information	Auto Lien Holder Registration
CDL Medical Status Verification	De-Insured Certificate/Affidavit of Non-Use
Medical Self-Certification	Abandoned Vehicle Information/ Impounded Vehicle Service
CDL renewal	Personalized/Specialty Plates Ordering (Complete Transaction)
	Personalized/Specialty Plates Ordering (Partial Transaction)
	Personalized/Specialty Plate Status
	Insurance Lapse Civil Penalty Payment
	Report Registration-Compliance Violator
	Vehicle Transaction Status
	Sold Notice/Notice of Transfer
	Registration Fee Calculator

Table 2. DMV Online Motor Carrier and General Services Provided by U.S. States

Motor Carriers (14)	All Divisions (11)
Account/Password/PIN Management (MC)	Change of Address
IRP Plate Inquiry	Live Chat
International Registration Plan (IRP) Filing	Mobile Application
International Fuel Tax Agreement (IFTA) Tax Filing	Transaction Status Check
OW/OD Permit	Schedule or Confirm DMV Appointment
Temporary Trip Permit	Traffic, Parking or Toll Citation Payment
Fleet Registration Renewal/Management	Administrative Hearing Request
Unified Carrier Registration	Salvage Yard Auto Hulk/Automobile Complaint Form (lemon law)
Submit 10-Year Driver License Info/Criminal Background Check	View Inspection Results
Fuel Tax/Weight-Distance Tax Filing	DMV Web Survey
Commercial Vehicle Permits/Decals	DMV Service Reminder
Commercial Driver Alcohol/Drug Testing Database	
Hazardous Materials License/Endorsement Renewal	
Transponder Application/Obtainment	

Driver Services

The kinds of online transactions in this category include pre-application for driver license issuance, license renewal, issuance of duplicate license (when it has been lost or stolen), conversion of an out-of-state license, and license reinstatement. A few states offer an electronic application for driver licenses (pre-application) before visiting a DMV office to save processing time at the office. Keeping lines manageable to increase efficiency and customer satisfaction is a point of emphasis. Many states offer both online license renewal and duplicate license issuance, but some only offer one of the two services. Conversion of an out-of-state license online is one of the more uncommon services. Out-of-state licenses present a challenge because it is difficult if not impossible to validate another state's identity verification processes. Some states require a customer to create an account to access the online driver license services to confirm their identity, but other states enable a one-time online transaction. DMVs throughout the United States have widely adopted the following online services: purchase of driving history records, scheduling road tests, handicap placard applications, and renewal of driver licenses.

Vehicle Services

Most vehicle services pertain to vehicle titling and registration. The most commonly offered online transaction in this group is registration renewal. Other services include online pre-application for vehicle titling and registration, new vehicle registration, vehicle titling and issuance of duplicate title and registration, and registration cancellation and refunds. In some states, the owner of a registered vehicle

can order personalized/specialty plates online and receive them by mail, but other states only offer partial transaction of the service.

Another class of vehicle services available on DMV websites is the filing of documents required by each state within a specified time frame. For example, New York State Vehicle and Traffic Law requires all involved drivers to file an accident report if the property damage exceeds $1,000, and it must be filed within 10 days of the accident. Another example of required online filing of paperwork is notices of a vehicle sale or transfer. New Mexico requires it to be filed within 30 days of the vehicle pick-up date.

Motor Carrier Services

Online transactions available for motor carriers include electronic tax filings for the International Registration Plan (IRP) and International Fuel Tax Agreement (IFTA). Most states provide online options to pay taxes and purchase overweight (OW)/over-dimensional (OD) permits online. Other services that are less common include fleet registration renewal/management, criminal background check for prospective employers, and transponder applications. States with a weight-distance or weight-mile tax for heavy trucks — Kentucky, Oregon, New Mexico and New York — also have an electronic tax filing option.

All Divisions

Eleven services do not exclusively fall into one of the three abovementioned groups. In some cases, they are related to more than two categories, in others they may be one of the general services DMVs provide. For example, users of DMV websites take advantage of the online address update function for their driver's license and vehicle registration. Some states let customers schedule appointments for licensing services, titling and registration related issues, or permits for commercial vehicles on DMV websites (or mobile application). Also, a live chat function is active during business hours in a few states, connecting a customer service representative and a customer to quickly resolve any issues.

Most Frequently Provided Online Services

To survey currently available online services in 49 states, we catalogued and analyzed the websites of agencies that administer driver licensing, vehicle titling and registration, and motor carriers. Some state DMVs have authority over all three divisions, but in some states, responsibilities are divided among several agencies. As indicated in Appendix A, 26 states established a consolidated agency, while the rest have divisions undertaking different functions across state and local governments. In California, the DMV is a division in the California State Transportation Agency, but many states including Colorado often establish their DMV in the Department of Revenue. Among states with multiple agencies handling different portions of DMV functions, Georgia and Utah operate using a commonly observed structure. In Georgia, the Department of Driver Services issues, renews, or replaces learner's permits, ID cards, and licenses. The Georgia Department of Revenue processes vehicle registration, issues license plates, and collects vehicle taxes. Similarly, Utah runs its driver license division in the Department of Public Safety for matters

related to licensing, but the functions related to both non-commercial and commercial vehicles are processed at the Division of Motor Vehicles in the State Tax Commission.

Our team surveyed relevant websites to identify the online services most frequently offered in the United States. Table 3 lists the online services which are provided by at least 30 states. The two most common services are vehicle registration renewal and online citation payments. They are the only services provided by all surveyed U.S. states, although there are sometimes county-level exceptions. In the case of online vehicle registration renewal service, many states offer it on their customer web portal, where customers can renew their registration regardless of the county where the vehicle is registered. However, some states offer the service at the county level and customers need to visit a county vehicle registration office (or an office that processes vehicle registration renewal) to renew online. The states that maintain customized services for individual counties often have more complex applications because the decisions related to service availability, processing fees, and third-party vendors working with the county depend on local decisions made by county officials rather than a uniform state government service design.

Table 3. Online Services Provided by More than 30 States

Division	Service and Count
Vehicle Services	Vehicle Registration Renewal (49)
All Divisions	Traffic, Parking or Toll Citation Payment (49)
Motor Carriers	International Fuel Tax Agreement (IFTA) Tax Filing (46)
Driver Services	Driving History Records (41)
Motor Carriers	International Registration Plan (IRP) Filing (40)
All Divisions	Change of Address (38)
Driver Services	Driver License/ID Renewal (35)
Vehicle Services	Personalized/Specialty Plates Ordering (Complete Transaction) (31)

The online citation payment service is commonly provided by court systems but not DMVs. Every state in the US provides an online payment option with limitations. Some sates offer the service on their state-level website; others offer it at the county level. When provided at the county or municipality level, some counties or municipalities do not offer the service. For example, in South Carolina, most counties offer the service, but Clarendon County does not accept online payments. Regardless of the exceptions, the general trend is to provide an online payment option in addition to in-person, mail, and telephone payment methods. Some states even allow one to appeal a traffic ticket and request a hearing online.

The next-most-frequently-provided service is IFTA tax filing. Interstate motor carriers are required to obtain an IFTA license and decals and file a quarterly report. To facilitate the process, 46 states provide an online service that lets carriers file IFTA taxes anytime and anywhere without having to visit agency offices or mail paper returns. Motor carriers that are required to file the IFTA tax are also required to register their vehicles with International Registration Plan (IRP) plates. Carriers must register with a base jurisdiction, which is generally where motor carrier headquarters or terminals are located. Carriers must track mileage in each participating IFTA and IRP jurisdiction. The base jurisdiction apportions the IFTA

taxes and IRP based on the miles traveled in each jurisdiction. Therefore, most states offer the two online services together.

An online driver history record request is provided by 41 states. The main reason why the remaining eight states only accept mail-in or in-person requests for driver history records is their state privacy laws. For the same reason, six of the eight states that do not accept online driving record requests do not process driver license renewals and duplicates online. The only exceptions are New Hampshire and South Dakota, which provide online driver license services but not driver history records.

Another online service commonly provided is an address change; 38 states currently offer this service. The 11 states that do not provide the online service require the vehicle owner to mail in the address change form to a DMV office or visit in person with proof of a new address within a specified period. Connecticut law requires the address change within 48 hours of any change of address, but other states allow longer. For example, Alabama and Indiana offer a 30-day notification period.

The next most frequently provided service is online driver license/ID renewal. Currently, 37 states allow license holders to renew online, but only 28 states permit online requests for duplicate licenses when they are lost or stolen. More surprisingly, not all the states issuing duplicate licenses online provide an online renewal option. It looks reasonable for agencies to offer online license renewal first and expand the service to issuance of duplicate licenses and reinstated licenses, but reasons for not providing online renewal can be found on DMV webpages. For example, Arizona, Arkansas, and Wisconsin require customers to visit a DMV office with proof of identity, have a new photo taken, and pass a vision screening. These states still offer duplicate license issuance online because it does not affect the expiration date on the original license; consumers are still required to update their recent photo and undergo a vision test as scheduled at the issuance of the original license.

The last service provided by more than 30 states is ordering personalized/specialty plates. Currently, 31 states provide this service, so consumers who want either a specialty plate or a custom license plate may place an order online and receive the plate by mail. Alabama and Florida let part of this transaction occur online. Alabama allows customers to choose a plate type and plate sequence and reserve their selections online, but the transaction must be completed at a licensing office. Florida makes it possible for a customer to check the availability status of the personalized plate configuration before visiting the local tax collector's office to apply for it.

Most Frequently Provided Online Services by Division

Most services were already mentioned in the previous section. However, we would like to highlight services not provided by the Idaho Transportation Department (ITD), but which are widely available elsewhere. Table 4 displays the most commonly provided services by division.

Among the common driver services, one that is not available statewide in Idaho is online road test scheduling. However, it is offered by Ada County Sheriff's Office. A person who does not reside in Ada County and wishes to schedule or confirm a road test must call the examiner's phone number in the

county he/she wants to take the test to make an appointment. Considering that more than 50 percent of the states (25 states) provide the online service, ITD may benefit from making this service available.

Among frequently provided vehicle-related services, the ones that are not available in Idaho are issuance of duplicate vehicle registration and online filing of sold notices. Duplicate vehicle registration can only be issued at a county assessor's office with a valid driver's license and current license plate number. Many states require a vehicle seller to report the transfer within 30 days, and most provide the form online. Online submission of the form is possible in 17 states, but Idaho requires the form to be mailed to a local county assessor's office within 5 days of the sale to be protected from liability after the delivery of the vehicle to the new owner. Allowing online filing of this form could improve accessibility for ITD's vehicle titling services.

Idaho offers all the commonly provided motor carrier services, but the two services that are not available under the all divisions category are online scheduling of DMV appointments and DMV service reminders. Approximately half of the 49 states we investigated provide these services. It is reasonable for ITD to consider a paperless option for vehicle registration and the driver license renewal notice, which could save ITD's resources used to send out paper reminders.

Table 4. Commonly Provided Online Services by Division

Driver Services	Vehicle Services	Motor Carriers	All Divisions
Driving History Records (41)	Vehicle Registration Renewal (49)	International Fuel Tax Agreement (IFTA) Tax Filing (46)	Traffic, Parking or Toll Citation Payment (49)
Driver License/ID Renewal (37)	Personalized/Specialty Plates Ordering (Complete Transaction) (31)	International Registration Plan (IRP) Filing (40)	Change of Address (38)
Duplicate Driver License or ID Card (28)	Duplicate Vehicle Registration (25)	OW/OD Permit (29)	DMV Service Reminder (24)
Driver License Reinstatement (25)	Vehicle Records (Title, Registration, Liens) (22)	Account/Password/PIN Management (MC) (26)	Schedule or Confirm DMV Appointment (24)
Schedule or Confirm Road Test (25)	Sold Notice/Notice of Transfer (17)	Temporary Trip Permit (22)	DMV Web Survey (15)

Comparison of Idaho's Neighboring States

Idaho ranks 20th in the United States (tied with Iowa and Tennessee) for number of online services provided, offering 21 services of interest. Figure 2 captures the number of services made available by each state. Among the 11 western states, Arizona and Colorado are shaded with the darkest blue (Figure 2),

indicating they have expansive portfolios of online services. Arizona provides 30 online services of interest for this study, and Colorado provides 28. Following these two states, Washington provides 25 online services, and 22 services are provided by New Mexico, Utah, and California, with slightly more diverse service provisions compared to Idaho. However, Idaho offers more online services than Nevada, Alaska, Oregon, Montana, and Wyoming.

The list of frequently provided services in the western states closely resembles the nationwide list (Table 2 and Table 3). Services provided by more than half of the western states but not by Idaho include online filling of sold notices, online scheduling of DMV appointments and road tests, online applications for duplicate vehicle registration, and online registration fee calculators. Given the prevalence of these services in other states, introducing these services could be an effective way to improve ITD's customer satisfaction.

Other states not geographically close to Idaho offer online DMV services of interest. Several states offer a large number of services, including Arkansas (30), Virginia (30), Wisconsin (27), Alabama (27), Massachusetts (26), and Texas (26). These states have diverse geographies, population densities, and agency characteristics. Based on the degree to which these state characteristics impact DMV services, DMV officials should consider looking at relevant neighboring states to develop services and implementation plans for state residents.

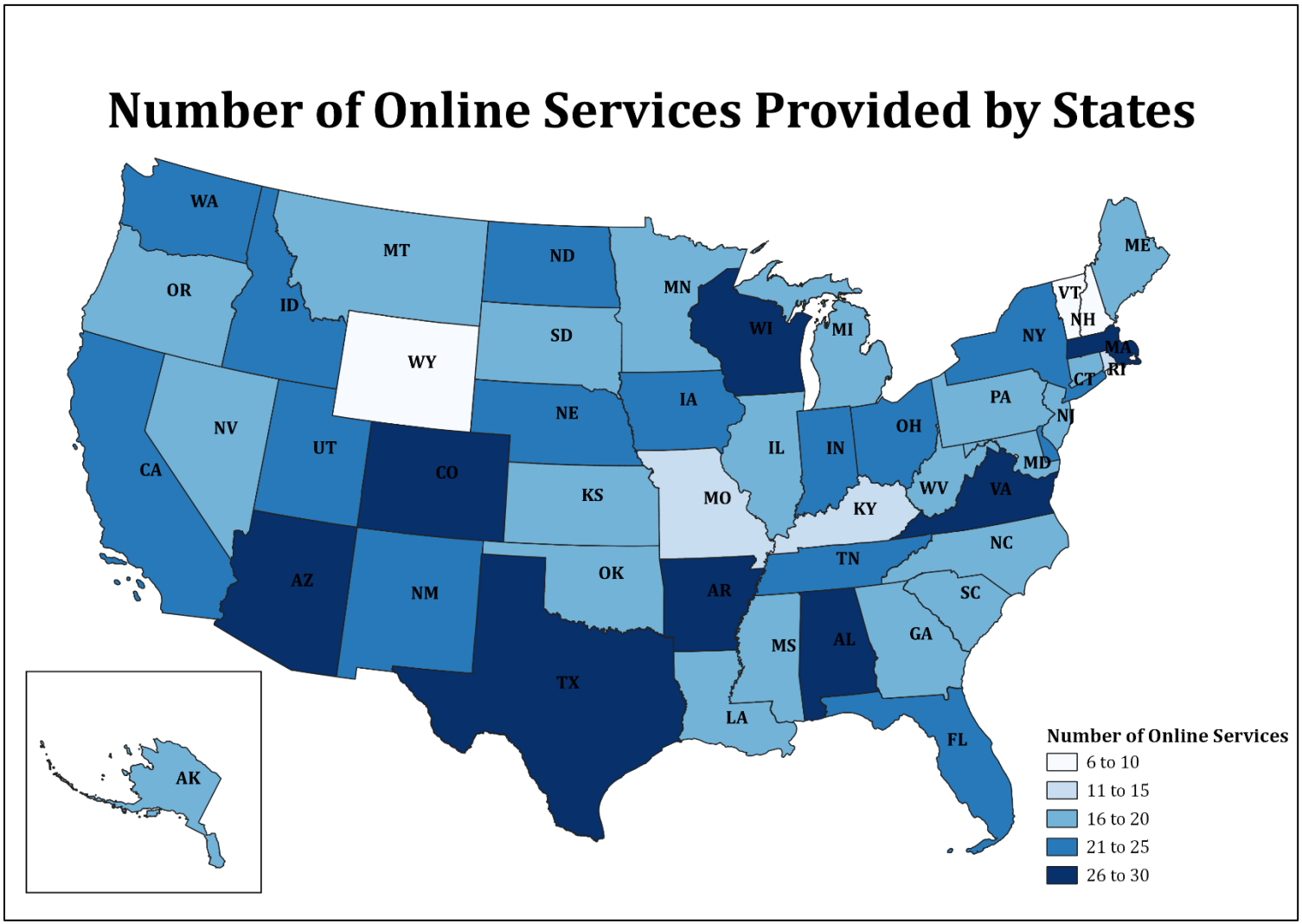

Figure 2. Number of Online Services Provided by States

Table 5 shows the processing fees applied to online registration renewal in states where it is available. Not all states are included in the table because for some applications the fee structure specifics are not available until a valid plate number is entered and the renewal process begins. In Alabama, most counties offer an online renewal option, but processing fees vary by county. Both St. Clair County and Baldwin County use a webpage designed and developed by Ingenuity, Inc. However, St. Clair County charges a 2.5 percent processing fee with a minimum of $1.50, while Baldwin County charges 3 percent with a minimum of $3.50. Collected fees cover website development and maintenance, credit card fees, and customer service. Further information on the specific allocation of the collected fees was not available. New Mexico and Virginia offer discounts, and Arkansas, Nevada, and Vermont do not charge an additional convenience charge on the regular registration renewal fee.

Table 5. Extra Fee Charged or Discount Provided for Online Vehicle Registration Renewal

State	Processing Fee for Online Vehicle Registration Renewal
Alabama	Offered at county level and the fee varies. Examples include 2.50% convenience fee + $1 per renewal process and 3.00% convenience fee with a minimum charge of $3.50 for a single tag renewal
Alaska	$10 walk-in fee
Arkansas	No additional charge
California	2.10% convenience fee
Florida	$2.00 convenience fee
Georgia	2.35% convenience fee ($1 minimum fee)
Idaho	3.00% convenience fee
Illinois	2.35% fee (minimum of $1.00) for credit cards/ $1.22 for electronic checks
Iowa	2.35% convenience fee for credit cards/ $3.95 for debit cards
Kentucky	Fee (N/A)+ $2.00 mailing fee
Maine	Offered at county level but the fee is charged at a fixed rate. 2.50% convenience fee
Minnesota	2.49% convenience fee
Mississippi	2.75% convenience fee
Missouri	$1.25 for transaction under $50.00 /$1.75 for $50.01-$75.00/ $2.15 for $75.01-$100.00/ 2.15% for $100.01 and up
Nevada	No additional charge
New Hampshire	Offered at county level but information on the additional charge is not available.
New Mexico	Net discount = 5% discount - $1.55 credit card fee
North Carolina	$3.00 convenience fee
South Dakota	2.25% convenience fee + $1.00 mailing fee
Tennessee	Offered at county level but information on the additional charge is not available.
Vermont	No additional charge

State	Processing Fee for Online Vehicle Registration Renewal
Virginia	$1.00 saving
Wisconsin	2.00% convenience fee
Wyoming	Offered at county level but information on the additional charge is not available.

Comparing the five western states for which information is available (AK, CA, ID, NV, and NM), Idaho charges the highest percentage in convenience fees, while Alaska and Nevada do not charge an extra fee at all. In fact, the Alaska DMV charges an extra $10 for customers who visit offices to renew their vehicle registration. Also, New Mexico offers a 5 percent discount for online renewals, even though a $1.55 credit card fee is charged during the process. However, a 5 percent discount is more than $1.55, resulting in a net positive discount in most cases. California charges 2.1 percent of the total transaction price as a convenience fee, but Idaho charges 3.0 percent. The extra fee charged in Idaho is definitely on the higher end, both in the region and the nation, raising a question about the relationship between a customer's decision to take advantage of the service and the extra fee associated with the service. If other states with lower convenience fees have a faster adoption rate of online services by customers, ITD may need to reevaluate the current convenience fee being charged.

Innovative Services

Through DMV website cataloguing, we identified three services of interest: live chat, mobile applications for the DMV practice exam, and mobile applications for DMV services. Currently, seven states (AL, DE, IN, IA, OH, PA, and UT) offer a live chat function on their websites during regular business hours. For example, the Delaware DMV website has a live chat banner on the top-right corner of the page (Figure 3). It is active during regular business hours (8:00AM to 4:30PM) and it connects a customer to a customer service representative via the internet. There is no empirical evidence showing whether live chat on DMV websites is more effective than a conventional phone call for addressing questions, since it is a relatively new practice. However, it is expected to be more effective since it has been adopted widely in the private sector and has many proven benefits: 1) Wait times are significantly shorter than other conventional communication methods. 2) Customers can multitask during the chat. 3) The conversation can be saved for future reference.

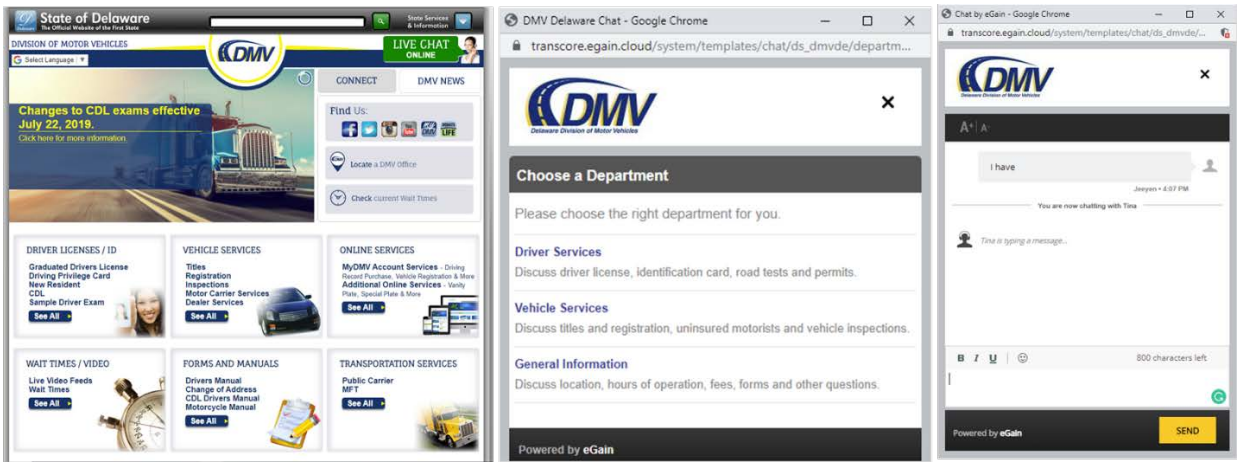

Figure 3. Live Chat Function on Delaware DMV website

The other two innovative and cutting-edge services we want to discuss are mobile applications for the DMV practice exam and mobile applications for general DMV services. The simplest form of available mobile application lets customers learn about traffic signs, signals, laws, and driving and safety rules before they take a written test to obtain a driver license. A mobile application for the practice exam is currently available in Arkansas, Delaware, Indiana, Montana, Nebraska, Pennsylvania, South Carolina, Tennessee, and Wisconsin at no cost to the customer. However, some states provide larger number of services through mobile applications, so customers could take care of DMV-related businesses using their smartphones (Figure 4). The variety of services available on mobile applications differs by states. For example, the Kansas DMV's mobile application (KS Vehicles Connect) lets users renew their vehicle registration, schedule DMV appointments, and find DMV offices. So far, nine states (CT, FL, GA, KS, MT, NC, ND, TN and VA) have developed mobile applications for general DMV services and have made them available to the public. However, the availability of these kinds of mobile applications is expected to increase in the near future.

Live chat and mobile application services are not common among the western states. Utah is the only state that offers a live chat function, and Montana is the only state which provides a mobile application for DMV services. ITD may need to consider offering these services given that more customers prefer online transactions using computers and smartphones than visiting DMV offices.

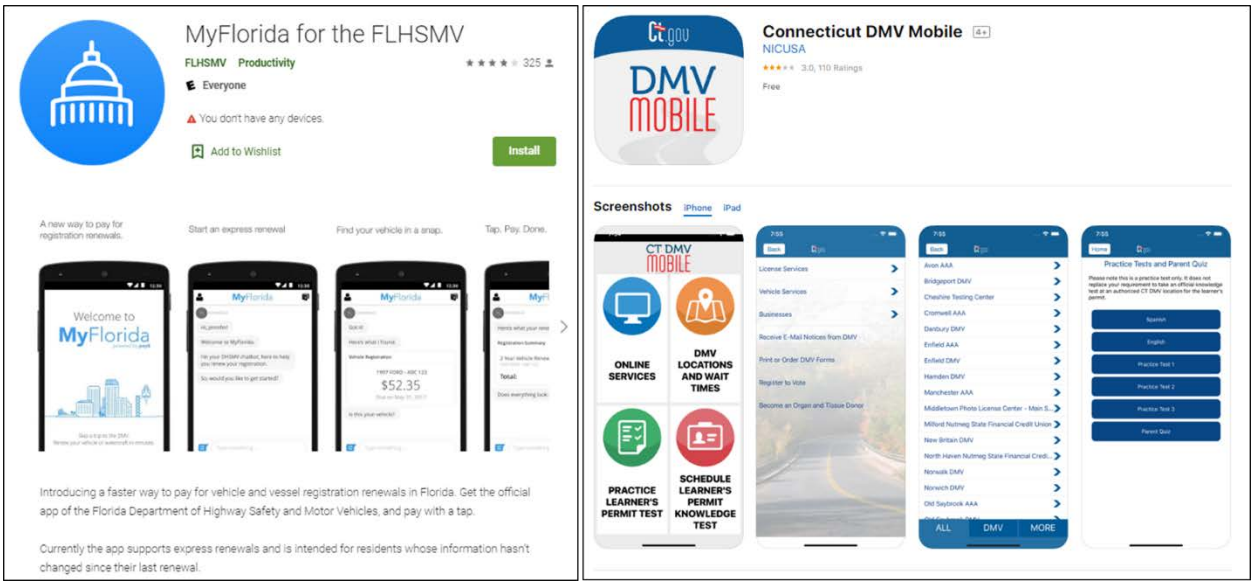

Figure 4. Mobile Applications for General DMV Services

Chapter 4
Electronic Signature

Electronic Signature Technology

E-signature technology lets people authenticate documents electronically. An e-signature takes the place of a handwritten signature. With e-signatures, people can sign contracts and engage in commerce online. It gives people an option to sign and return documents in a shorter amount of time than is possible via postal mail, and it reduces the amount of paper needed to print document as well as retain the records.

Governments must choose among multiple e-signature methods and technologies. An e-signature can consist of a digitized image of a handwritten signature, digitized fingerprints, a retinal scan, personal identification number (PIN), or a typed name. According to Blythe (2005 and 2011) there are four levels of e-signature security that range from simple to complex. At the most basic level, a party reads the contract terms and indicates consent by choosing "I agree" and/or typing their name. A person could also submit a biometric e-signature in the form of a photograph, retinal scan, fingerprint, or voice pattern. The most complex form of e-signature — a digital signature — is a mathematical algorithm that uses encryption and decryption to ensure that a document remains unmodified from the time one party signs and transmits it until another party receives the document (Department of Homeland Security, 2019). A digital signature uses encryption technology to create a digital fingerprint that verifies that the two parties exchanging information or making a contractual agreement are who they say they are (Department of Homeland Security, 2019). The most common type of digital signature used by governments and businesses is public key infrastructure (PKI). PKI uses a series of digital certificates, registration authorities, encryption, and decryption to authenticate the identities of entities that are exchanging confidential information online (Department of Homeland Security, 2019). PKI protects confidential information during e-commerce, banking, and governmental transactions as well as email.

E-Signature Legal Issues

Since the 1990s, governments throughout the world have debated the legal issues surrounding the legitimacy of e-signatures. Most laws related to e-signatures stipulate that this form of authentication indicates consent to an agreement and is as legally binding and enforceable as a handwritten signature. E-signature laws also specify which documents are acceptable for e-signatures. While contracts and government documents can use e-signatures, countries often exclude birth certificates, marriage certificates, or divorce decrees (Blythe, 2011).

Blythe (2005) traces international efforts to promote and codify e-signature from the 1990s and argues that laws are inconsistent internationally, which threatens the level of security for online transactions and diminishes the trust that people have in the use of e-signatures. The United Nations Model Law of Economic Commerce of 1996 (MLEC) states that digital signatures should be accepted as legal in the same way as ink signatures as long as the signer is identifiable, acknowledges they approved the signature, and

the e-signature method s reliable (Blythe, 2005). The United Kingdom's Electronic Communications Act of 2000 and the European Union's (EU) E-Signatures Directive of 2002 developed legislative rules making e-signatures as legally binding and enforceable as pen and ink signatures in court (Blythe, 2005). In the case of the EU directive, members were required to accept e-signatures from other member countries. The United States adopted the Uniform Electronic Transactions Act (UETA) in 1999 and enacted the Electronic Signatures in Global and National Commerce Act (ESIGN) in 2000. These laws made e-signatures legally binding and enforceable but allowed states to determine what type of e-signature technology was acceptable in their states (Blythe, 2005). In contrast, the EU directive gave clear preference to PKI technology and created standards for PKI certification authorities because PKI is generally considered to be more secure than other e-signature methods (Blythe, 2005). According to Blythe, the EU's laws created a more secure environment using e-signatures than the United States by mandating that members use the security method most likely to protect the integrity of the signed document.

Uniform Electronic Transactions Act and the ESIGN Act

The National Conference of Commissioners of Uniform State Laws developed the UETA. It made the use of e-signatures and electronic contracts legally permissible (National Conference of Commissioners of Uniform State Laws, 1999). The document sought to create consistency among states with respect to e-signatures and electronic records. UETA provides guidance on acceptable methods for accepting e-signatures for both business and government entities. According to UETA, for an electronic document or contract to be legally binding, an electronic record and electronic signature must be connected, which means that an e-signature must be attached to the electronic document for it to be a legal contract (National Conference of Commissioners of Uniform State Laws, 1999). Forty-seven states, including Idaho, have adopted the guidelines set forth in the UETA and three other states have enacted laws modeled after the guidelines.

The UETA guidelines were adopted a year prior to the enactment of the ESIGN Act, which was signed into law by President Bill Clinton on June 30, 2000. The purpose of ESIGN was to encourage states to use electronic records and signatures, especially for national and international commerce (Federal Deposit Insurance, 2014). The ESIGN Act allows for the substitution of an e-signature for any handwritten signature required by state statute or regulation, provided the signatory gives formal consent (Federal Deposit Insurance, 2014). Under ESIGN, each state is free to adopt laws governing e-signatures, but those statutes and regulations must use the general recommendations of the ESIGN law.

At a basic level, ESIGN confers legitimacy on the use of electronic signatures, as it stipulates that these types of signatures on contracts are as legal, acceptable, and enforceable as handwritten signatures (Electronic Signatures in Global and National Commerce Act, 2000). The law encourages businesses and governments to use consumer disclosure documents to ensure both parties in a transaction understand and consent to the use of e-signatures in the transaction (Electronic Signatures in Global and National Commerce Act, 2000). A consumer disclosure must inform consumers of their rights. Consumers have a right to:

- A record on paper or non-electronic version of the transaction

- A disclosure of any fees that may be charged for obtaining the record in paper version
- Information about the specific transactions to which the signature will apply
- An option to withdraw consent (Electronic Signatures in Global and National Commerce Act, 2000)

Consumers must also be informed of the hardware and software requirements for signing, transmitting, and receiving documents (Electronic Signatures in Global and National Commerce Act, 2000). ESIGN excludes contracts or records relating to wills, testamentary trusts, court orders, and laws or statutes pertaining to family law (e.g., divorce or adoption). ESIGN also excludes the use of e-signatures in notifications for utility disconnection, evictions, and foreclosures. In addition, e-signatures cannot be used in documents related to life insurance or health insurance termination (Electronic Signatures in Global and National Commerce Act, 2000).

There are many similarities between UETA and ESIGN but there are also important differences. UETA serves as guidelines for government and business; states have an option to adopt those guidelines. However, ESIGN is federal legislation governing interstate commerce (Fry, 2019). According to a memo from Patricia Brumfeld Fry (2019), a member of the committee that developed UETA, the guidelines are more comprehensive than ESIGN. UETA specifies what electronic records are admissible in court, the attribution of a signature to ensure a signature actually belongs to the signatory, and security measures to protect confidentiality and the authenticity of the signature (Fry, 2019). The UETA also established the location where documents can be transmitted and received. Electronic documents are to be sent or received from the person's place of business or home (Fry, 2019).

State Statutes and E-Signatures

Our team reviewed the statutes of Idaho as well as Arizona and Texas. While the statutes vary in length and content, all meet the guidelines of the UETA. As a result, these statutes use similar verbiage.

Idaho

Idaho's statutes on e-signatures are found in Title 28 Commercial Transactions, Chapter 50 Uniform Electronic Transactions Act. Idaho enacted the law in 2000. The statutes refer to this as the Uniform Electronic Transactions Act (28-50-101) and refer to both electronic records and e-signatures.

Under this law an e-signature consists of an "…electronic sound, symbol or process attached to or logically associated with a record and executed or adopted by a person with the intent to sign the record." (28-50-102)

The law also specifies security measures that state agencies can use to ensure the authenticity of e-signatures. It allows for the use of algorithms or other codes, identifying words or numbers, encryption, callback, or other acknowledgment procedures for e-signatures. Title 29-20 excludes the use of e-signatures for certain documents: wills, codicils or modification to wills, trusts, the waiver or renunciation of a claim or right after a breach, and documents related to sales and leases (28-50-103).

According to 28-50-105, the use of an e-signature is voluntary, and its use in a transaction must be agreed upon by the two parties conducting the transaction. If either party agrees to use an e-signature for one transaction, that does not mean they must conduct other transactions using an e-signature; this provision of the law cannot be waived. (28-50-106).

Idaho law 28-50-107, states that any contract signed with an e-signature is legally binding and enforceable and that e-signatures can be used as evidence (28-50-113). In addition, documents normally sent by certified mail can be transmitted electronically with consent of the recipient. The law also allows for records to be notarized electronically.

Each agency in Idaho state government can determine whether it will accept electronic signatures. If an agency determines that e-signatures are acceptable, it must also determine the format of e-signature that will be used (28-50-118).

Arizona

Arizona's e-signature statutes are less detailed than Idaho's Uniform Electronic Transactions Act. The law was enacted in 2016 (AZ Rev Stat § 44-7007). The law states that a record, signature, or contract is legal and enforceable if it is in electronic form. In addition, any record, signature, or contract which a statute or regulation requires to be in handwritten form can also be submitted in electronic form. Notably, the Arizona statute does not include any limitations on the types of documents eligible for an e-signature.

The statutes which address e-signatures are ARS 28-364 and 28-453. The Arizona statutes include a section on e-signatures and the Arizona Department of Transportation (ADOT). Arizona statute 28-453 gives ADOT the authority to accept electronic communication, abstracts, affidavits, applications and other records.

ARS 28-364 establishes the powers of the director. Section E Subsection 1 empowers the director to establish a system or process that allows ADOT to mail notifications or legal documents electronically or digitally if the recipient agrees to accept those documents through a secure or electronic digital system. It also lets the director implement other electronic or digital versions of documents related to the department, including driver licenses, ID cards, vehicle registration documents, and license plates. The same section of the statute includes the phrase "or any other official record of the department" which staff considers to include e-signatures.

Texas

The Texas statutes addressing e-signatures are found in the Business and Commerce Code. Under this statute, an e-signature is "an electronic sound, symbol, or process attached to or logically associated with a record and executed or adopted by a person with the intent to sign the record." (Section 322.002). The statute also defines security procedures which can be used to verify an e-signature. Those include the use of "algorithms or other codes, identifying words or numbers, encryption, or callback or other acknowledgment procedures." The Texas statutes limit the documents which can be signed with e-signatures. Wills, codicils, or testamentary trusts may not be signed with an e-signature (Sec. 322.003).

The statute also excludes transactions that fall under the Uniform Commercial Code, which governs matters involving creditors and debtors.

E-signatures are voluntary and can only be used if the two parties engaged in the transaction agree to use that form of signature (322.005). As with Idaho, if an individual agrees to conduct one transaction with e-signature or electronic record, that person can opt out of e-signature in subsequent transactions.

According to the law, an e-signature is legal and enforceable (322.007) and may be used for contracts as well as laws requiring signatures. E-signatures are admissible as evidence in court proceedings (Sec. 322.013).

The Texas law does not specify the type of security or e-signature required. Section 322.009 says an e-signature is attributable to the person if the person signed the document. The signature can be shown in any manner and any security form to verify the signature. Notaries can use e-signatures as long as the person includes all of the other information that is required for notarization together with the signature (Sec 322.012).

This statute also lets each state agency determine whether it will accept e-signatures and the means in which the signature is created, generated, stored, processed, used, or relied upon. Section 322.017 does not specify the type of e-signature or the type of security that will be used to verify the signature's authenticity. However, the statute gives the Texas Department of Information Resources (DIR; the IT division for the State of Texas) and the Texas State Library and Archives Commission the authority to specify the type and security method used for e-signatures. In addition, the statutes give the DIR the ability to encourage agencies to adopt similar requirements for electronic records and e-signatures as well as make recommendations to the Comptroller.

Issues with E-Signature Policy and E-Signature Implementation

Using e-signatures carries clear benefits. E-signatures reduce the processing time for documents because government agencies do not have to wait extended amounts of time for customers to sign documents (Government Finance Officers Association, 2018). E-signatures lower costs because government agencies require less paper and space, as would be needed for paper records (Government Finance Officers Association, 2018). E-signatures are also more efficient and require less processing time (Government Finance Officers Association, 2018).

The key goal of e-signature technology is protecting against *repudiation*, which means a person cannot attempt to claim it is not a legitimate contract (DocuSign, 2019).To do this, states must be able to accomplish four main objectives when implementing an e-signature technology. First, they have to be able to show proof of intent, which means the parties making the transaction were aware they were signing a legally binding contract. Second, the states must have proof of identity since there is no face-to-face interaction with e-signature technology. There should be multiple levels of authentication that are easy for users to operate to prove the signatory's identification (Government Finance Officers Association, 2006; DocuSign, 2019). Third, states must identify any modifications made to the signature or electronic record during transmission (Government Finance Officers Association, 2006). Fourth, state agencies must

ensure the technology provides the ability to establish a permanent audit trail or a chain of custody, which produces an alert or warning if there has been any kind of change to the record during transmission (GFOA, 2006; DocuSign, 2019). This audit trail will also trace the document from the time the person signs it until it is received (DocuSign, 2019). States should also create and transmit documents as PDFs (which cannot be altered), develop policies and procedures to limit employee access to electronic records, and consult with experts in this type of technology (GFOA, 2006).

ESIGN and UETA did not mandate what type of e-signature technology or security measures should be used to ensure authenticity. These omissions were purposeful; the authors of UETA and ESIGN wanted to leave options open for the development of new technologies (DocuSign, 2019). States need to decide how to implement the technology, legal issues associated with implementation, and ensure they comply with ESIGN and UETA (Holcomb, 2019). States are left to decide whether to use less costly, yet less secure methods (e.g., clicking boxes or using PINs) or more costly, more secure, PKI technologies (e.g., DocuSign and Adobe).

Research has shown the authenticity of e-signatures is sometimes questioned and that people are apt to take documents they sign with e-signature less seriously than documents requiring handwritten signatures (Chou, 2014). This increases the chance of breach of contract. Eileen Chou (2014) tested several types of e-signatures finding the "I agree" boxes to be the least trustworthy. However, methods like DocuSign are more like handwritten signatures, and therefore the signers are more likely to take signing the document seriously. She argues that governments need to consider these factors when choosing e-signature methods.

Electronic and Digital Signature for Motor Vehicle Agencies and Department of Transportation

While research into electronic and digital signatures has generally analyzed how their use applies to non-DMV government agencies and businesses, there is some research that is specifically relevant to motor vehicle agencies. In 2008, ADOT conducted a Digital Signature Feasibility study which looked into the implementation of electronic signatures at the agency. The study stated that the verbiage in federal and state laws support the use of electronic signature at ADOT but many back-office transactions (e.g., bidding and procurement) and front office processes (e.g., motor vehicle transactions), continued to utilize handwritten signatures (Cioffi and Fallows, 2008). However, implementing e-signature technologies could let ADOT provide end-to-end electronic transactions.

In their ADOT feasibility study, Cioffi and Fallows (2008) conducted a survey of states to determine the prevalence of e-signature use. The survey revealed that over half (55.6 percent) of the state agencies which responded to the survey used e-signatures in their daily transactions (Cioffi and Fallows, 2008). Among the respondents that had not implemented those technologies, over 70 percent planned to implement them in 2 to 3 years (Cioffi and Fallows, 2008). States that had not adopted the technologies indicated several factors determined why they were not in use. Of the states using e-signatures, most relied on third party digital signature technologies, such as Adobe or Verisign, rather than internally developed signature technologies (Cioffi and Fallows, 2008). However, e-signatures were most commonly

used in internal processes such as bidding, procurement, timesheets, travel vouchers, and similar documents (Cioffi and Fallows, 2008). In fact, only 15 percent of responding states used e-signatures in licensing and registration activities.

A title is a certificate issued by a motor vehicle agency identifying legal ownership of a vehicle, along with vehicle information and date of purchase. A lien is an unpaid debt owed against a vehicle to a third party. Lien information is listed on the vehicle title as well as a separate document. An electronic lien/loan and title (ELT) is a digital record of vehicle ownership and any lien holders. A similar technology, electronic vehicle registration (EVR) allows approved vendors to register vehicles with DMVs. This lets purchasers and lien holders obtain documents electronically through dealers, lienholders, and motor vehicle agencies. ELT and EVR offer many benefits. First, ELT and EVR decrease the amount of time needed to process lien, title, and registration documents (Lutz, 2015). ELT tracks vehicle history from the point of manufacture to the end of the lifecycle. ELT and EVR reduce vehicle title fraud because it becomes much more difficult to conceal a history of junk and salvage titles or altered odometer readings (Lutz, 2015; Owens, 2018). As Keathley, Martin, and Walton argued in 2019, the practice of concealing title histories (title washing), as well as inconsistencies in title recordkeeping by state motor vehicle agencies, makes it very difficult to ensure that a vehicle's title information is accurate, despite the prevalence of commercial and federal title history services. Additionally, e-titling cuts down on labor costs due to fewer vehicle history searches and manual tasks. ELT and EVR make the process of releasing liens as well as transferring out-of-state vehicle titles more efficient (Owens, 2018). ELT and EVR transactions also lead to fewer mistakes on documents than paper titles and registrations (Lutz, 2015; Owens, 2018). ELT and EVR eliminate most of the need for paper copies, thereby decreasing postage and printing costs as well as the amount of storage needed to retain paper documents (Owens, 2018). ELT and EVR are also useful for high-volume dealerships (Owens, 2018).

The bedrock of ELT and EVR is the use of e-signatures and electronic records. ESIGN permits e-contracts for automobile sales (Burden, 2019). Although UETA and ESIGN verbiage permits the use of e-signatures and electronic records in all but a few specific documents, not all states have deployed the technology. Currently, 36 states permit ELT and 39 permit EVR (Owens, 2018). The main obstacles to implementing these technologies have been state statutes which mandate that state vehicle registrations and titles receive handwritten (wet) signatures as well as outdated DMV systems (Owens, 2018). According to Burden (2019), confusion exists over whether the ESIGN law takes precedence over state law. California adopted a law in 1999 that legalizes digital signatures except for vehicle sales and leases (Burden, 2019). As a result, dealers choose not to utilize e-signatures despite pressure from finance companies (Burden, 2019).

Partisan politics have also played a role in states' reluctance to accept e-signature. Many states require that vehicle titles be notarized. There was a contentious debate in Idaho's House of Representatives over a bill which would permit the use of electronic notaries. The bill was modeled after guidelines from the Uniform Law Commission, the same body of legal experts and legislatures that developed the UETA. One group of representatives expressed suspicion about the Uniform Law Commission's motivation for creating the guidelines, saying these types of bills threaten state sovereignty and possibly pave the way

for a global planning agenda (The Associated Press, 2017). While the bill passed, it is clear that the legitimacy of e-signatures remains unsettled almost 20 years after the adoption of UETA and ESIGN.

States are also reluctant to implement ELT and EVR technologies due to the federal regulation that odometer disclosures have wet signatures. Under the National Highway Traffic Safety Administration's (NHTSA) Truth in Mileage Act of 1986, titles must have the odometer reading disclosed. With the exception of odometer readings, all parts of a vehicle transaction could be completed electronically. The intent of the Truth in Mileage Act was to protect consumers, however, AAMVA argues the wet signature provides no more identity verification than the electronic odometer disclosure process (AAMVA, 2018). In fact, according to AAMVA's *Roadmap to Electronic Odometer Disclosure* (2018), the wet signature makes it more difficult to track and verify odometer readings for vehicle transactions and titles because paper documents can be altered following a transaction (AAMVA, 2018).

However, the Fixing America's Surface Transportation (FAST) Act gave states the right to decide whether to permit e-signatures on odometer readings. The FAST Act, which was passed by Congress and signed by President Obama on December 4, 2015, was the first federal law in 10 years that provided long-term funding for surface transportation infrastructure and investment. In 2019, NHTSA established a final ruling making electronic odometer disclosures permissible (NHTSA, 2019). However, some states still require wet signatures for odometer readings. The NHSTA ruling acknowledges that electronic signatures could result in cost savings and improved efficiencies for agencies and customers.

We located policy memos online from Iowa's Department of Transportation and the Texas Department of Motor Vehicles regarding the use of e-signatures. The Iowa DOT memo is specific to the Vehicle and Motor Carrier Services personnel, while the Texas Department of Motor Vehicles memo addresses motor vehicle dealers, insurance companies, financial institutions, and salvage pool operators.

The Iowa DOT memo informs Vehicle and Motor Carrier Services personnel that, based on Iowa law, all forms, applications, or documents that require an ink signature may also be signed electronically with the exception of odometer disclosures. Electronic notarization is permissible as long as the notary meets all of the legal requirements for notarization and is physically present. The memo acknowledges that motor vehicle agencies have been relatively slow in adopting e-signatures and electronic records, despite their being commonplace in banking, real estate, medicine, and the legal system. However, the agency does not mandate a particular type of e-signature. The memo only states that Iowa agencies will most likely use DocuSign or Adobe, but leaves the door open for electronic signature pads, a printed name, a code, or a graphic image of a signature. The memo provides instructions for using e-signatures on specific agency forms and specific instances where e-signatures are acceptable or not acceptable. For example, a customer can bring an e-signed document to the counter in a branch office, or it can be transmitted electronically. Customers can choose to use wet signatures as opposed to an e-signature.

The audience is different for the memo from the Texas Department of Motor Vehicles. It is intended to inform business customers about e-signature policies. Unlike Iowa, Texas requires customers to submit all e-signed documents electronically through their webDEALER or webSALVAGE online systems. If any part of the transaction must be completed with physical documents, an e-signature may not be used. For

example, if the document is initially submitted online but physical documents are required, the entire transaction requires wet signatures. As with Iowa, Texas does not recommend or mandate a particular e-signature technology. However, the memo does establish policies that prevent repudiation and protect authenticity. The e-signature system must be securely maintained, capture and retain the signer's IP address, retain the information for five years, and be able to provide documents if they are requested by the DMV.

The memos from Iowa and Texas illustrate the difficulties that states confront in implementing e-signatures in their daily activities. They must determine specific instances in which an e-signature is permissible, methods for transmitting e-signature documents, and the forms on which e-signatures can be used.

Conclusions

State DMVs have only recently started to use e-signature technologies. While this is a well-established practice in banking, insurance, medicine, real estate, and various courts, there are many reasons states have lagged behind the private sector. State laws have been unclear as to how DMVs should implement e-signatures. Federal and state laws continue to require wet signatures on certain documents, including odometer readings and vehicle sales contracts. The UETA guidelines and ESIGN law are arguably vague on how state agencies should implement e-signatures. States are responsible for determining which technologies best fit their budget and best protect the authenticity of documents. Nevertheless, states are beginning to use these technologies more frequently, and recent AAMVA guidance on electronic odometer disclosures can assist states looking to implement e-signatures for vehicle titles and liens.

Chapter 5
Results of Motor Vehicle Agency Survey

Introduction

Our research team created a survey containing 13 substantive questions (both multiple choice and open-ended response). We developed the questions and hosted a conference call with ITD DMV staffers to discuss the questions. Following that call, questions were modified to incorporate the suggestions from ITD. Once ITD representatives approved the questions, they were sent to the American Association of Motor Vehicle Administrators (AAMVA) to be disseminated through their online survey tool, which gave all US states the opportunity to participate.

The survey asked questions pertaining to the development and maintenance of online web services, solicited information on specific tools (e.g., mobile applications and e-signatures), and queried funding sources for online services. Our team was also interested in gathering data on the types of benefits that states have realized from online services. The remaining questions asked about the most recent technologies, services, and enhancements that states deployed as well as any future services states expect to yield benefits for their DMV programs. Once the survey period elapsed, KTC researchers analyzed the results and summarized the results. The summary also includes a detailed analysis of online service adoption rates that were submitted by Georgia, Maine, Virginia, and Wisconsin.

Twenty-two U.S. states submitted responses. This represents a 44 percent response rate, which is considered a good target response rate in survey literature (Dillman, Smyth and Christian, 2014). Participating and non-participating states are mapped in Figure 5. States shaded dark blue submitted a response, while states that did not submit a survey response are shaded in white.

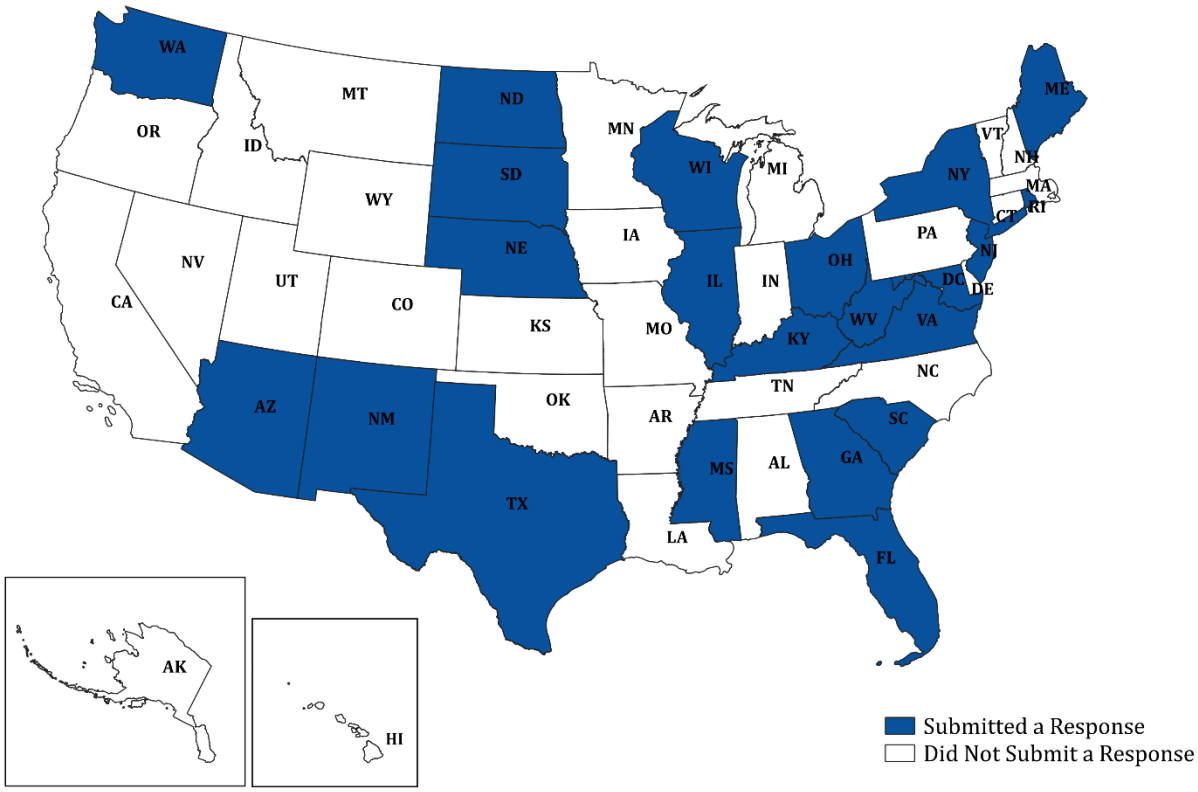

Figure 5. State Survey Participation

Development and Maintenance of DMV System Components

As Keathley, Martin, and Walton (2019) argued, states frequently target motor vehicle agency budgets when addressing revenue shortfalls. These agencies deal with increasing demands despite declining budgets, forcing agencies to do more with less while still meeting the needs of their diverse customer bases (Keathley, Martin, and Walton, 2019). The ever-increasing regulatory requirements of the REAL ID and Commercial Driver's License (CDL) issuance is another source of increased workload for motor vehicle agencies (Keathley, Martin, and Walton, 2019). As a result, states increase fees, close motor vehicle agency branches, decrease service hours, or even privatize branches (Keathley, Martin, and Walton 2019). These cost saving measures can reduce customer satisfaction (Keathley, Martin, and Walton, 2019).

Developing online services can help states address these problems. However, developing, deploying and maintaining online services can be expensive and many states are using outdated systems. States must carefully choose a source for programming and maintenance. They can choose from in-house development, third-party vendors, or a combination of public and private developers. There are benefits and drawbacks to each approach. In-house developers understand the culture and technology of the agency and have a vested interest in seeing the project succeed (De Marco, 2019). In addition, communication is important when developing e-government technologies, so having individuals who are in the same organization can facilitate communication (De Marco, 2019). Third-party vendors are generally not immersed in the agency culture and may be located offsite, which can limit communication with developers.

However, in-house employees may not have the skillsets needed to make needed programming changes, which could require training or hiring new employees and place a strain on budgets (De Marco, 2019). In addition, in-house programmers may underestimate the time needed to complete the project which can delay deployment (De Marco, 2019). In contrast, third-party developers have set timelines for project completion and conduct thorough risk management assessments to identify and address potential challenges that may arise during the project (De Marco, 2019). Third-party vendors also have access to a wider pool of skilled workers than most state agencies (De Marco, 2019).

Development of DMV System Components

Question 1 asked respondents whether they used an internal developer, an external developer, or a combination of the two to develop the following DMV system components: Website, Mainframe/Server/Cloud Architecture, Software Applications, and Payment Engine. Twenty-two states responded to this question. In some cases, states provided more detailed information about their systems and those responses are included in the summary.

Website Developers

A slim majority of states that responded (41 percent) used both internal and external sources to develop their DMV websites (Figure 6). Thirty-six percent of the respondents used internal development teams, and 23 percent of states used only external development teams.

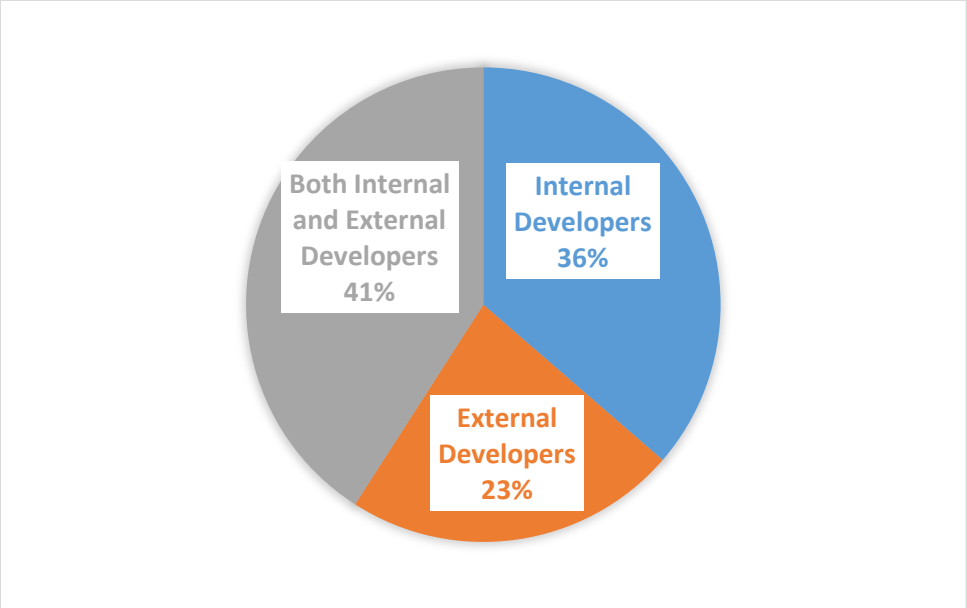

Figure 6. DMV Website Developers

Georgia's DMV site is hosted by the Georgia Technology Authority and uses the Drupal content management framework. Drupal is an open-source platform under the GNU general purpose license which is written in PHP, a general-purpose programming language used in web development. This enables the agency to access, manage, and publish its own data. New York's DMV public website was initially developed by a third-party vendor also using Drupal. The third-party vendor used Drupal 7. In-house developers have since taken over the system and will migrate the site to Drupal.

The South Carolina DMV (SCDMV) website consists of two components: the base website providing SCDMV-related information, and transaction processing. The base website was developed and is maintained by an external vendor. The transaction components are built primarily in-house, with some components built by a third party, which is entirely maintained by the SCDMV.

Architecture Developers

A near-majority of respondents (48 percent) use both internal and external developers for their mainframe/server/cloud architecture systems. As seen in Figure 7, a slightly smaller percentage of states (38 percent) used internal development teams for their architectures. Fourteen percent of the respondents used external development teams.

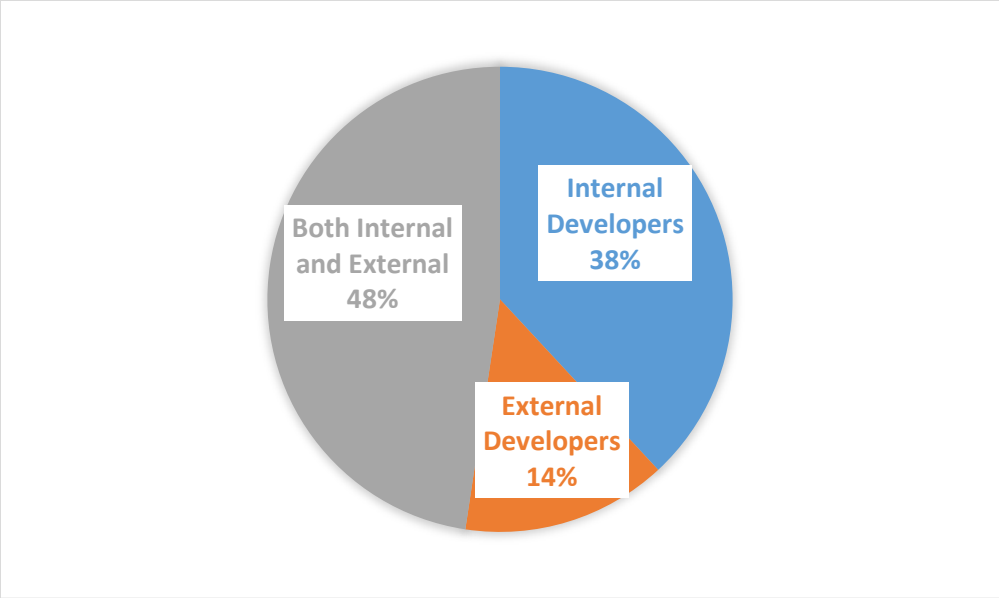

Figure 7. DMV Website Architecture Developers

Ohio's storage and mainframe architectures were developed in-house. Eventually the agency migrated the system to the Ohio Department of Administrative Services Information Technology Office, where it is currently housed and maintained.

South Carolina's mainframe system was developed internally by the SCDMV, but this component will be phased out by the end of 2019. Most of the server architecture was built and maintained by the SCDMV. Less than 10 percent of the components were built and maintained by third parties. The SCDMV also utilizes Software as a Service (SaaS) applications that are entirely built and maintained by third-party vendors.

Software Developers

A clear majority of states (60 percent) employed both internal and external development teams for their system software (Figure 8). Twenty-five percent of states used internal development teams and 10 percent used external developers.

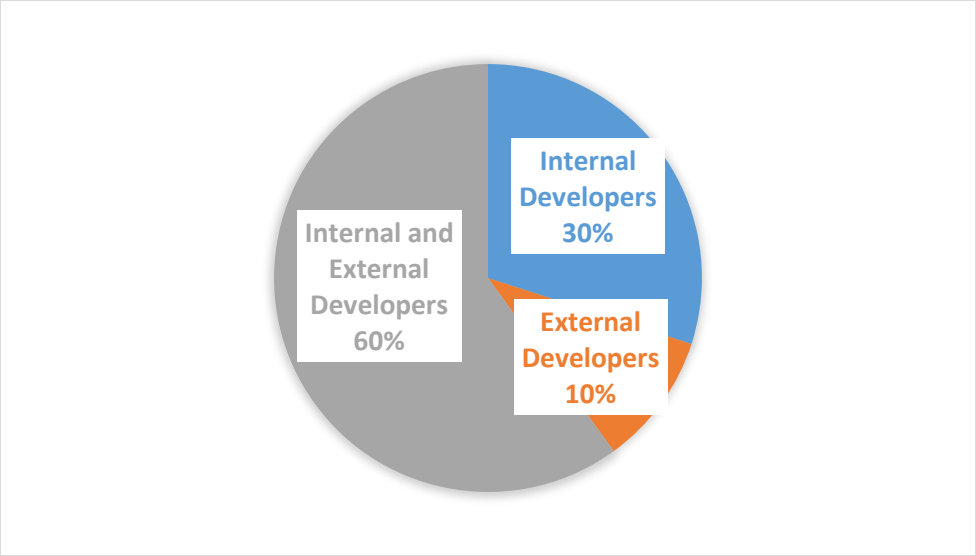

Figure 8. DMV Website Software Developers

New York's DMV administrators contracted development of agency architecture to an IT group outside of New York's DMV but within New York state government. Unlike the public website, the applications are hosted on New York's state-owned servers.

The SCDMV's primary application was built by a third-party vendor but is maintained by the SCDMV. Throughout its lifetime, several vendors have modified various aspects of Phoenix, the SCDMV transactional database, but it is considered a homegrown application. The SCDMV uses a number of third-party applications to support functions like credential issuance, branch office queuing, facial recognition, skills testing, road testing, scanning, mail tracking, credit card processing, motor carrier services, and others. Approximately 40 percent of the SCDMV functions are supported by third-party applications.

Payment Engine Developers

As seen in Figure 9, 57 percent of the states used external developers for their online payment engines. Forty-three percent used a combination of external and internal development teams to build their payment engines. None of the states used internal development teams. The SCDMV developed and maintains a payment engine that collects and accounts for cash in branch offices and interfaces with a third-party credit card processing system for web transactions.

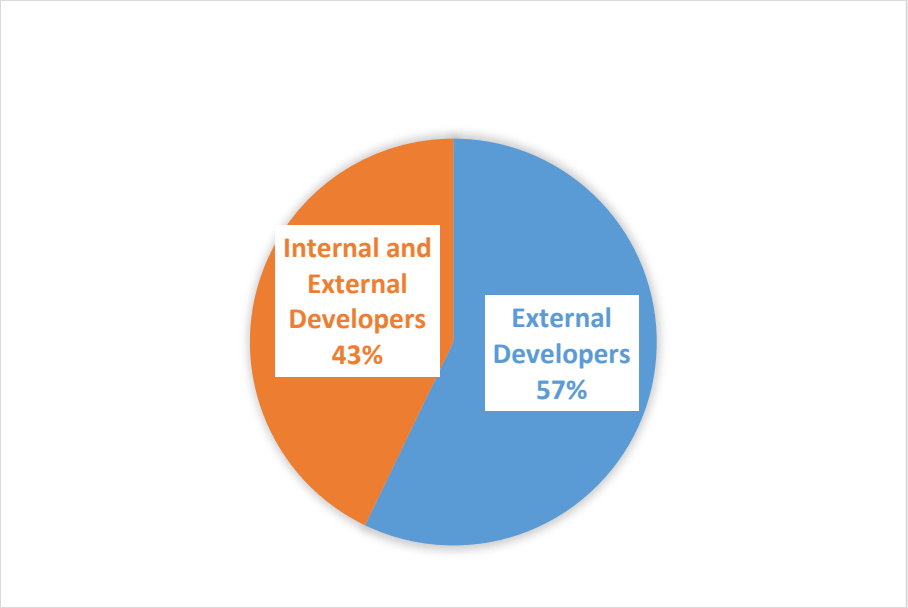

Figure 9. DMV Website Payment Engine Developers

Maintenance of DMV System Components

Question 2 solicited similar information to that of Question 1, but it inquired about DMV system components instead of payment engines. It asked who maintains the DMV online system components. Respondents were asked to indicate whether maintenance on the website, architecture, software, and payment engine is internal, external, or both internal and external.

Website Maintenance

Twenty respondents answered the survey question about whether their agency or agencies maintain websites internally, externally, or using a combination of both approaches. The vast majority of state DMV or DMV-related websites are maintained internally, at least in part (Figure 10). Fifty percent of the websites are maintained internally while only 15 percent are maintained externally. Thirty-five percent of state agencies use both internal and external maintenance for their websites.

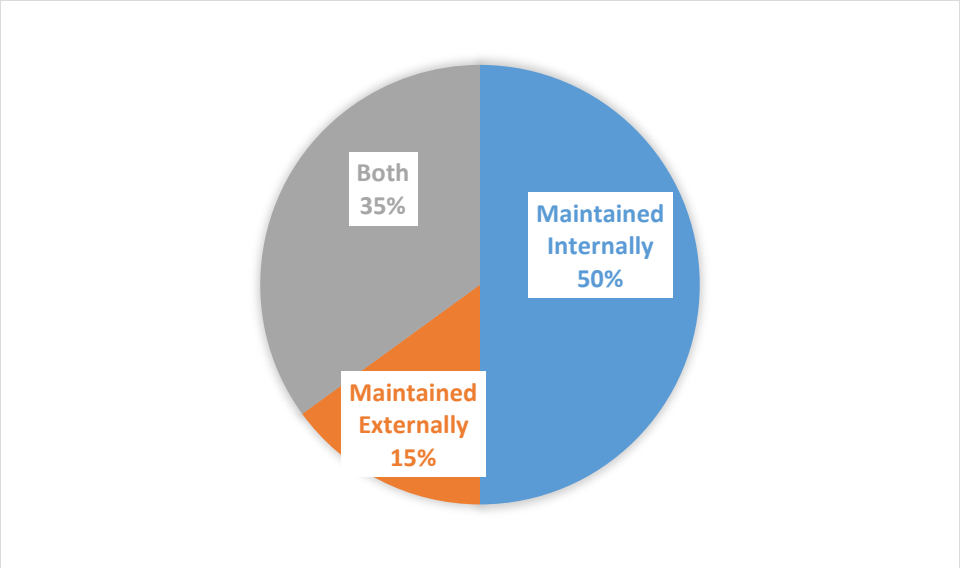

Figure 10. Maintenance for Websites

Architecture Maintenance

Twenty states also provided information on the maintenance of their mainframe/server/cloud architecture for DMV-related services. Most agencies use internal maintenance for their architecture. Fifty percent of the respondents maintain their architecture internally while only 10 percent maintain their architecture externally through third-party sources (Figure 11). Forty percent of the respondents use both internal and external services to maintain their architecture.

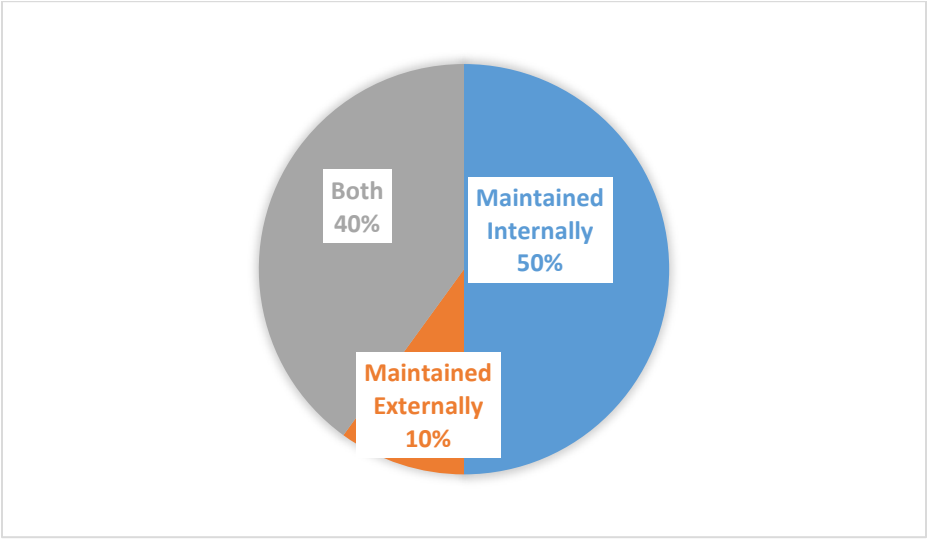

Figure 11. Maintenance for Mainframe/Server/Cloud Architecture

Maintenance for Software Applications

Most states use both internal and external services to maintain their online software applications. Fifty percent of the responding states use a combination of internal and external sources for maintenance (Figure 12). Twenty-five percent of the states maintain software applications internally, and 25 percent use third-party services to maintain software applications.

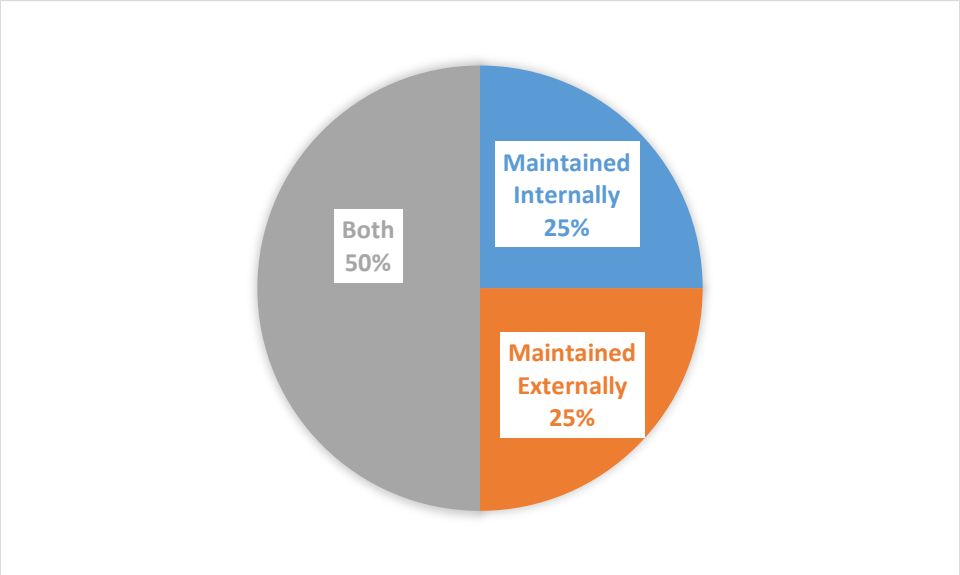

Figure 12. Maintenance for Software Applications

Payment Engine Maintenance

Only 18 states answered the question about the approached adopted for payment engine maintenance. Most states use external third-party services to maintain their payment engines.

Figure 13 below shows that 50 percent of respondents employ third-party vendors to maintain their payment engines, while only 11 percent maintain them internally. Thirty-nine percent use a combination of internal and external sources for payment engine maintenance.

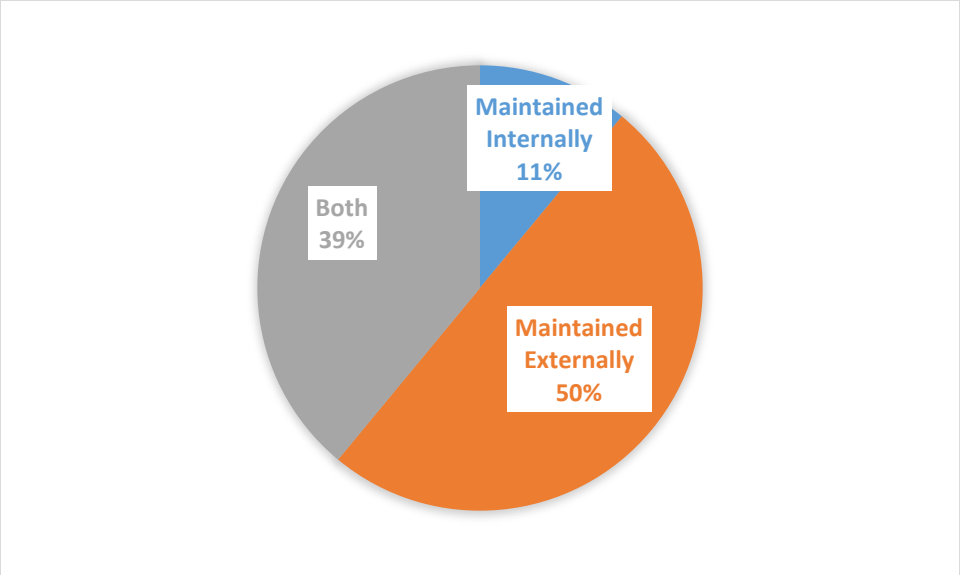

Figure 13. Payment Engine Maintenance

Conclusions about Development and Maintenance of Online System Components

Despite the benefits of using third-party vendors to develop and maintain online services, many states use a combination of internal and external developers. It appears that internal developers have a slight edge over external developers with architecture. However, there is a clear preference for third-party vendors when developing payment engines.

For the most part, states use internal sources to address maintenance needs, particularly for their websites and architectures. States use an even combination of internal and external sources for software maintenance. States are also primarily relying on third-party, external sources for payment engine maintenance.

Mobile Government Applications

Mobile government or "m-government" represent the next step in the deepening of e-government technologies. M-government is the adoption of mobile technologies to supplement and enhance the service of government agencies (Organization for Economic Co-operation and Development (OECD), 2012; Raja et al, 2012; Karetsos, Costopoulou, and Sideridis, 2014; Zo 2009). These technologies include broadband, WiFi, laptops, tablets, smartphones, and texting. Mobile government can supplement e-government technologies already in use by government agencies to make public services more accessible to underserved populations and increase government engagement with the community (Raja et al, 2012; Karetsos, Costotopoulou, and Sideridis, 2014). In addition, m-government promises many of the same benefits of e-government, such as enhanced transparency and accountability of government agencies (OECD, 2911). However, while broadband is included in m-government technologies, many populations lack access to broadband due to limited infrastructure development and the expense of broadband installation as well as access (OECD, 2011). Therefore, their access to traditional e-government tools such

as websites can be limited by cost-effective means to access the internet. The development and implementation of smartphone applications provide a promising solution to the issue of the digital divide.

According to the Pew Research Center (2019), 96 percent of Americans own a cellphone, and 81 percent of those phones are smartphones. This is a dramatic increase from 2011, which was the first survey Pew conducted on the subject (Pew, 2019). In 2011, the percentage of smartphones among cellphone owners was only 35 percent (Pew, 2019). The same survey found approximately 50 percent of Americans own tablets (Pew, 2019). Despite the fact that 75 percent of Americans own a desktop or laptop computer, research shows that a growing segment of individuals depend entirely on smartphones for internet access (Anderson, 2019). Twenty percent of Americans do not have traditional internet access at home and primarily use their smartphones to access the internet (Anderson, 2019). So, the use of m-government is an important step in reaching this demographic.

The same survey found that certain demographics are much less likely to have access to the internet, namely individuals living in rural areas, individuals in the black and Hispanic communities, and people who are disabled (Perrin, 2019; Perrin and Turner, 2019; Anderson and Perrin, 2017). This is known as the digital divide. However, mobile technologies have played a role in softening the digital divide. A 2019 Pew study showed that mobile technologies are on the rise in rural areas. Another study showed that while black and Hispanic Americans are much less likely to have broadband access to the internet, particularly at home, the digital gap is not as wide for the use of smartphones (Perrin and Turner, 2019). Approximately 80 percent of people in those communities own a smartphone, and around 25 percent rely solely on their smartphones to access the internet (Perrin and Turner, 2019). Similarly, just over 25 percent of households earning less than $30,000 a year rely solely on their smartphones for access to the internet while only 5 percent of households earning over $100,000 are in a similar position (Anderson and Kumar, 2019). These are all communities which could greatly benefit from the increased access of mobile applications and increased engagement with the government. Disabled persons are also less likely than non-disabled persons to have access to the internet (Anderson and Perrin, 2017). A significant portion of this population is elderly (Anderson and Perrin, 2017). Many websites are not accessible to visually impaired individuals, and a Pew Research center survey in 2016 found that less than 40 percent of disabled persons feel confident in their ability to use technologies that would allow them to access the internet on a regular basis (Anderson and Perrin, 2017). So mobile government and smartphone applications could be an important way to improve engagement with groups that are historically underserved by government agencies.

Question 3 asked respondents whether their agencies have smartphone applications that allow customers to conduct DMV-related services. Twenty-one jurisdictions provided responses to this question. Most states do not currently have a smartphone application (Figure 14). Only 38 percent of the agencies have a mobile application for smartphones, while 62 percent of the states do not have a smartphone application. Seven of those states (Arizona, Florida, Wisconsin, Georgia, Virginia, Nebraska, and South Caroline) have smartphone applications for driver's license services and five states have applications for vehicle licensing services (Arizona, Florida, North Dakota, Virginia, and Wisconsin). Florida is the only state which has a mobile application for motor carrier services.

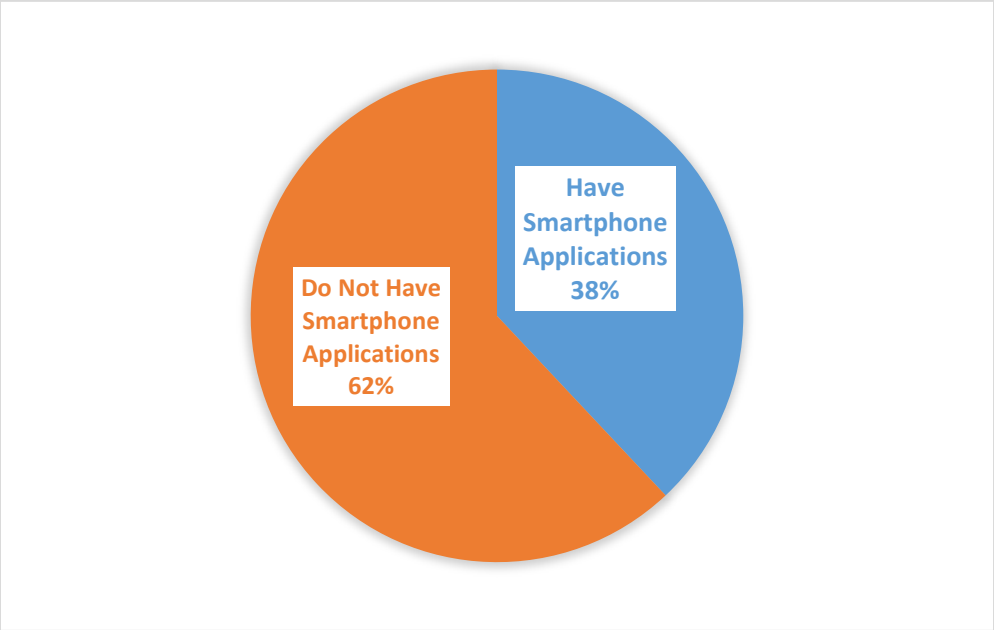

Figure 14. DMV Agencies That Offer Smartphone Applications

Based on additional comments from respondents, it is apparent that states may forgo creating separate mobile applications and simply create websites that are mobile friendly. New York's website and online applications employ a responsive web design so the page content and functionality render appropriately on the user's device at any screen resolution. In Ohio, certain motor vehicle-related services can be completed on a smart phone and other internet-enabled devices, but the agency has not developed a smartphone application. In addition, states may only offer a limited number of services on a mobile application. For example, North Dakota's only smartphone application is one which lets customers renew their vehicle registration online. South Carolina's smartphone application is for practice driver knowledge tests for standard operating licenses, which does not include CDL. Wisconsin also has phone applications for the general driver's license as well as the CDL practice test questions.

Since most states in the survey do not offer specific smartphone applications — instead opting to rely on access through websites — it is important to know whether those websites can be accessed on mobile phone websites. A 2019 PC Magazine survey of 2,033 smartphone users found that 54 percent of respondents use the iOS platform and 42 percent use Android platforms (Marvin, 2019). Another two percent use other unspecified platforms, while an additional two percent do not use any platform (Marvin, 2019). The same survey found a clear divide among states in terms of choice in platforms. In general, less populous states had higher numbers of Android users.

Question 4 asked respondents whether their agency's websites are compatible with the most commonly used mobile operating systems, iOS and Android. Twenty-one states submitted an answer. The vast majority of the websites are compatible with these systems. Figure 15 shows that 90 percent of the states operate websites that are compatible with both. Only 10 percent of those states have websites that were

not compatible. So, most of the surveyed states are using m-government to increase their service offerings, despite the lack of smartphone applications.

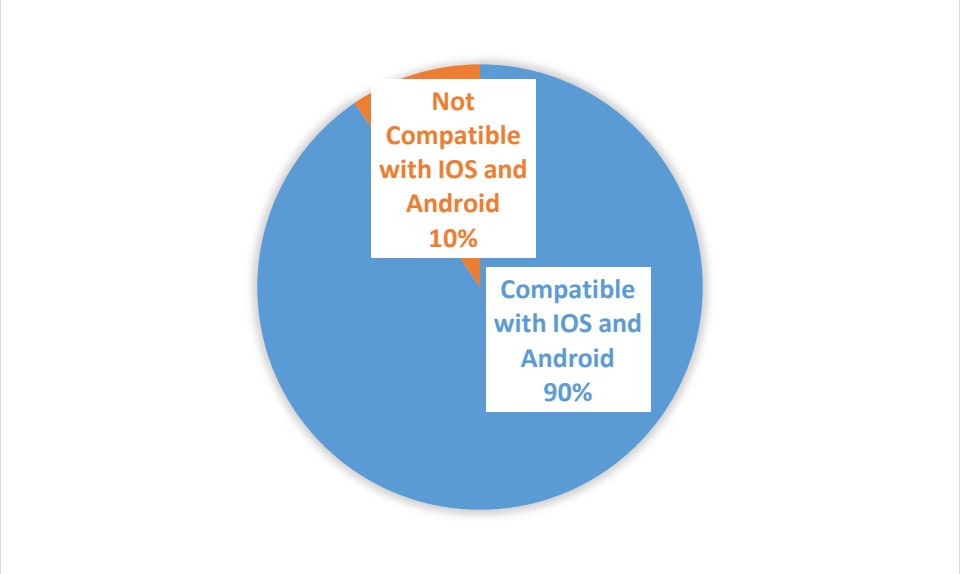

Figure 15. DMV Websites Compatible with iOS and Android

Funding Sources for Online Applications

Despite the benefits e-government services confer to state agencies and customers, these systems can be expensive to develop, deploy, and maintain. This can be particularly challenging for motor vehicle agencies, many of whom are facing budget shortfalls. For example, in 2017, the state of Virginia was facing a $13 million shortfall for the 2018 fiscal year and an estimated $93 million shortfall by 2022 (Marz, 2017). Determining the source of funds for online DMV services is a priority before embarking on these projects. Question 5 asked respondents how they fund their online services. Twenty-two states responded to the question.

The survey gave the choice of four possible funding scenarios as well as an *Other* category. Respondents could choose multiple categories when applicable. Those four choices were:

- User Fees: Efficiency or transaction fees that customers pay for the processes they use in a transaction. These fees are usually used to pay private contractors who build and maintain the services.
- General Budget Appropriation: A maximum sum of public funds for programs and services set aside in the state budget.
- Capital Budget Appropriation: Money set aside by the state government to fund prioritized improvement projects, including projects funded by other revenue sources;
- Grants: State or federal assistance to fund public services.
- Other

Over half of the agencies use multiple sources of funding for their online services (Figure 16). Sixty-four percent of the funding sources consist of general budget appropriations followed by funding sources from user fees generated during the transactions (55 percent). Another 18 percent of the states received funds from a capital budget appropriation, while 14 percent received grant funding. Fourteen percent of the respondents also chose the *Other* category. More than half of the respondents chose more than one finding source.

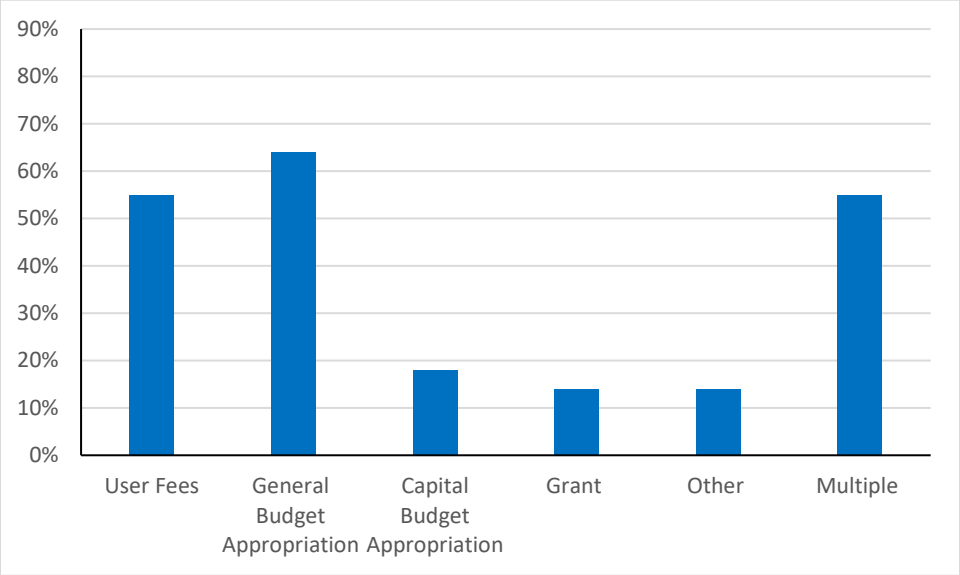

Figure 16. Funding Sources for DMV Online Services

Arizona uses retention fees while the online partner retains a small portion of fees collected during the transaction. Some of the New York DMV's online transaction applications are paid through various different special revenue funds. While South Carolina web site transactions are mostly funded through general appropriations, SCDMV also uses federal grants to fund some web transactions. In Washington State, the DMV's annual budget is generated through vehicle registration fees and DMV transaction fees. However, in the case of a revenue shortfall, the agency supplements the funding with general funds. Virginia has a self-funded agency, meaning the state legislature requires the agency to pay mandatory costs such as salaries, benefits, credit card fees, and IT expenses (Martz, 2017).

E-Signatures

This report explored the use of e-signatures in state governments and DMV activities in Chapter 4. The federal government requires business and government to accept e-signatures for contracts and many government documents, but DMVs have been relatively slow in adopting e-signature technologies. This is due to concerns about legal issues such as federal and state requirements for motor vehicle licensing and registration, as well as security issues regarding transmitting and accepting documents with e-signatures. Research has found that many DMV agencies have used e-signatures for back office tasks such as procurement or timesheets, but were slow in adapting their front office (or customer-facing) processes

to e-signatures. However, more states are using e-signatures, one consequence of which is that electronic liens and titles are becoming more common.

With e-signature challenges in mind, we wanted to determine how many agencies are using e-signature for online DMV transaction services. Twenty-one respondents answered Question 6, which asked if their state uses e-signatures for online customer transactions. The percentage of states accepting e-signature versus states that do not accept e-signature is comparable — 52 percent of responding states do not accept e-signatures for online transactions, while 48 percent of responding states do (Figure 17).

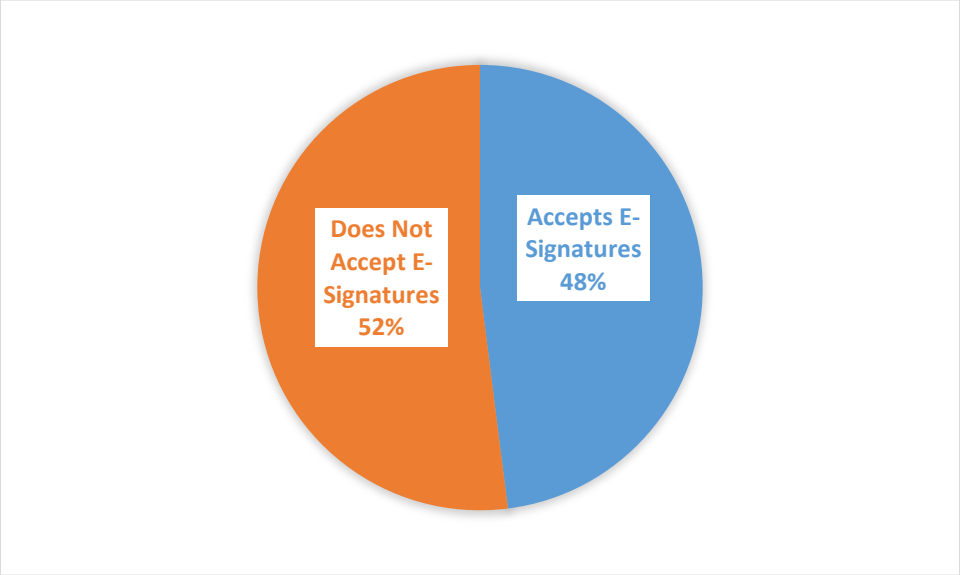

Figure 17. DMVs That Accept E-Signature

Some respondents provided additional information about their agency's policies on e-signatures. New York's DMV requires customers to agree to an electronic attestation to perform online transaction services that would enable the customer to view and/or update a customer record. Ohio permits e-signatures for vehicle registration renewal services.

South Carolina and West Virginia do not accept e-signatures, but they are researching the possible benefits of adopting an e-signature policy. South Dakota accepts e-signature for online renewal or duplicate license applications. The Virginia DMV uses a secure user account logon as a form of digital signature authorizing key transactions. Wisconsin permits e-signature for select driver license applications, but not for motor carrier or vehicle transaction services.

Adoption Rates for Online Services

Given the expense of developing and maintaining online services, as well as the benefits of adopting online customer service tools, ensuring that customers use these services is an important step in the process. Research has shown that many states have adopted incentive programs to encourage customers to use online services as opposed to making in-person visits to branches.

Question 7 asked respondents about the adoption rates of online services. They were asked to share statistics on adoption rates by providing information in the comments, attaching a document to the survey, or emailing it to a designated individual at ITD.

Some respondents provided comments in the survey document. The adoption rate for Arizona's permit test at home has been surprisingly high, with almost 50 percent of instruction permit tests taken at home instead of an office. That percentage would likely be higher except there are age restrictions for at-home testing. In addition, Arizona vehicle owners complete more than 70 percent of registration renewals electronically. This includes online, telephone response, and self-service kiosk. Consumer transactions on the online portal, ServiceArizona.com, average more than 500,000 a month. On the other hand, the adoption rate for Arizona's eTitle Transfer is low, with an average of less than 100 per month. That is due in part to the limitations placed on the situations where a title can be transferred electronically and the relative complexity of the service for security process.

Maryland encourages its customers to use the alternative service delivery option rather than making in-person visits to reduce congestion at their Motor Vehicle Administration (MVA) offices. Alternative service delivery options include self-service kiosks, online options, and an interactive voice response system. According to the respondent from Maryland, around 65 percent of MDOT MVA transactions are through Alternative Service Delivery.

North Dakota provides multiple online driver's license services such as renewal, status check, replacement licenses and IDs, scheduling driver tests, and making appointments for various services. According to the respondent from North Dakota, the adoption rate has been between 15 to 20 percent of customers.

Respondents from four states (Georgia, Maine, Virginia, and Wisconsin) provided detailed information on the adoption of online services in their responses. Each state provided information in the format that is internally circulated, so the comparison between states was challenging. However, the tables below were generated from the original data provided in an effort to find the general trend — which could help ITD improve the adoption rate of online services by its customers.

Online Vehicle Registration Renewal

The Virginia DMV shared its *Preferred Services Report* for the First Quarter-Fiscal Year 2020. The report compares the use of various online services in the first quarter of FY2020 to the same quarter of FY2019. As seen in Table 6 from July 1 to September 30 in 2018, 718,750 vehicle registrations were renewed through the DMV website — 56.9 percent of total renewals. In 2019, a similar percentage of registration renewal transactions were completed through the website (56.4 percent). Two years of data are not sufficient to discuss a trend with confidence, but these data suggest that the Virginia DMV has a stable portion of customers who take advantage of the online registration renewal service. On the other hand, the number of vehicle registrations renewed in Kentucky has been increasing at a higher rate. The number of transactions for three months in 2018 was 2.6 times greater than that in the same period of 2015.

Table 6. Adoption of Online Vehicle Registration Renewal Services (Virginia)

Fiscal Year/ Quarter	Number of Transactions	Percent of Total
2019 Q1	718,570	56.90%
2020 Q1	724,428	56.40%

The Maine Bureau of Motor Vehicles (BMV) provided annual data, and these data are compared to annual data from Kentucky in Table 7. Two trends are apparent from the data. First, Maine has a higher percentage of motorists renewing vehicle registrations online than Kentucky. According to FHWA, Maine had 1,094,388 registered vehicles in 2017, whereas Kentucky had 4,293,205. So, 13.3 percent of vehicles in Maine were registered via online vehicle registration renewal, whereas only 1.3 percent of vehicles registered in Kentucky were registered via online renewal. Two caveats should be noted. First, the FHWA and state numbers almost surely have discrepancies. Second, the total registration undoubtedly includes new vehicles and other vehicles not eligible for online renewal. However, the difference is significant enough to conclude Mainers are renewing registrations online at a higher rate than Kentuckians. However, Maine's online registration numbers have not risen as quickly as Kentucky's in recent years. This comparison shows that the Kentucky Transportation Cabinet (KYTC) has expanded its online customer base at a higher rate than the Maine BMV in recent years. In 2018, 16.97 percent more transactions completed made using online vehicle registration renewal in Maine compared to 2017, but it is relatively small compared to Kentucky's 59.54 percent increase over the same period.

Table 7. Adoption of Online Vehicle Registration Renewal Services (Maine and Kentucky)

Year	Maine Transactions	Kentucky Transactions
2015	143,876	43,896
2016	136,897	62,228
2017	145,702	77,451
2018	170,429	123,562

Online Driver License Renewal

The Maine BMV provided the number of driver licenses renewed online from 2015 to 2018 (Table 8**)**. The number of annual transactions has grown steadily, increasing 30.03 percent from 2015 to 2018. There was a significant jump between 2015 and 2016, but growth was more gradual between 2016 and 2018.

Table 8. Adoption of Online Driver License Renewal Services (Maine)

Year	Transactions
2015	38,202
2016	45,498
2017	47,935
2018	49,677

In Table 9, we can see that Virginia's DMV experienced a significant decrease in year-over-year service usage. While 27.2 percent of total renewal transactions were completed using the website in the first quarter of FY 2019, the usage decreased by more than half in the same quarter in FY 2020. Karen Grim, Deputy Commissioner for Operations at Virginia DMV identified two reasons for the decline (personal communication, February 6, 2020). One possibility is the impending federal deadline for states to implement the REAL ID by October 2020. Individuals without a REAL ID will not be able to board a plane, enter a federal courtroom, or (in specific cases) gain access to a U.S. military base as of October 1, 2021 Obtaining a REAL ID for the first time requires an office visit to provide the required documentation and have it scanned in the SDLA's secure database. Many drivers who are required to renew their ID have been deciding to upgrade to a READ ID, which cannot be processed online. The other explanation for the decline is related to the 16-year natural cycle of the Virginia DMV. Virginia's license is valid for eight years, and drivers are eligible for online renewal every other license. Every 16 years, drivers are required to make a personal appearance at the office for the renewal. The Virginia DMV is witnessing a large group of people who are ineligible for online renewal in FY 2020 Q1, but who were eligible for the online service in FY 2012 Q1. The significant decline is called the "cliff" by the Virginia DMV, and they think it is a part of a natural cycle.

Table 9. Adoption of Online Driver License Renewal Services (Virginia)

Fiscal Year/Quarter	Number of Transactions	Percent of Total
2019 Q1	53,624	27.20%
2020 Q2	28,755	12.50%

Electronic Notification Service

The Wisconsin Department of Transportation provided data on the number of customers who signed up for their eNotify service between 2015 and 2018. Customers could choose to receive email or text

reminders to renew their vehicle registration and driver license and other DMV notices. Since 2016, approximately 30,000 new customers signed up for the electronic notification service, and the continuing expansion of the user base could save DMV resources that have been used to send out notifications by mail (Table 10).

Table 10. Adoption of Electronic Notification Services (Wisconsin)

Year	Added	Accumulated
2015	9,632	17,283
2016	29,197	46,480
2017	28,513	74,993
2018	29,696	104,689

Mobile Application

With the increased popularity of mobile devices among citizens, e-government services began to offer mobile applications as a means to improve accessibility. The popularity of mobile applications among DMV customers can be discussed in detail with the data provided by the Georgia Department of Driver Services (GDDS). The GDDS launched a mobile application — DDS 2 GO — on September 6, 2018. Since the launch, a monthly average of 9,257 customers have downloaded the mobile application — which breaks down to 3,571 Android device users and 5,686 iOS device users. Considering the 2018 market share of Android and iOS in Georgia was 29.63% percent and 70.08% percent respectively, the download occurrence difference between the two systems reflects the market share (Device Atlas, 2018).

The most relevant figures in Table 11 are found in the last two columns. Among the new customers who decided to try out the mobile application, increasing numbers eventually made transactions using the application. During the first full month (September 10, 2018, to October 9th, 2018), 1,813 transactions were completed, but the number of transactions increased by 3.7 times within a year.

Table 11. Adoption of Mobile Application (Georgia)

Totals as of this Date	Monthly Android Downloads	Accumulated Android Downloads	Monthly iOS Downloads	Accumulated iOS Downloads	Monthly Mobile App Transactions	Accumulated Mobile App Transactions
09.10.2018		6,187		8,593		197
10.09.2018	5,560	11,747	6,241	14,834	1,813	2,010
11.05.2018	3,070	14,817	5,044	19,878	2,333	4,343
12.08.2018	2,856	17,673	4,116	23,994	1,891	6,234
01.03.2019	1,482	19,155	2,342	26,336	2,015	8,249
02.04.2019	3,699	22,854	5,257	31,593	3,137	11,386
03.11.2019	4,486	27,340	7,216	38,809	4,139	15,525
04.01.2019	2,228	29,568	4,130	42,939	4,397	19,922
05.01.2019	2,376	31,944	5,037	47,976	3,912	23,834
06.01.2019	1,871	33,815	5,551	53,527	4,035	27,869
07.01.2019	3,466	37,281	5,046	58,573	4,955	32,824
08.01.2019	5,445	42,726	2,954	61,527	5,600	38,424
09.04.2019	4,058	46,784	9,205	70,732	6,711	45,135
10.02.2019	3,209	49,993	8,870	79,602	5,977	51,112

Table 12 shows that the number of customers using the GDDS website decreased while the mobile application users increased in September 2019 compared to the same month in 2018. The last column shows that the total logins increased, but a large group of customers moved from the website to the mobile application when dealing with DMV related issues.

Table 12. Adoption of Mobile Application (Georgia)

Month	New Website Accounts	New Mobile App Accounts	Total	Website Logins	Mobile App Logins	Total
9/2018	39,530	5,587	45,117	206,925	30,347	237,272
9/2019	30,844	6,929	37,773	199,853	99,057	298,910

Benefits of Online Services

Our literature review on e-government cited multiple benefits for states that adopt these technologies. According to the literature e-government increases efficiency, decreases operating costs, improves customer service, and increases public engagement.

Research has shown that online transactions can lead to significant savings for states. According to a 2011 article in *Government Technology*, Tennessee compared the cost of in-person transactions to the cost of online transactions and found the state saved $90 million due to e-government transactions (Douglass, 2011). In 2012, the Center for Public Policy and Administration at the University of Utah conducted a study that found Utah saved $13.20 each time a customer utilized online services rather than offline services. Over a five-year period, this resulted in a cost savings of $46 million (Center for Public Policy and Administration, 2012).

Our research team was interested in determining whether agencies have realized the oft-cited benefits of e-government. Question 8 asked respondents to indicate the types of benefits their agencies after adopting online services. States could choose from: cost savings, greater efficiency, enhanced customer service, or other. If a state chose "other" they could specify the additional benefits for their state. There were 22 responses to this question.

Over half of the states have saved money from online transactions. Most of the benefits were less quantitative in nature, with respect to online services improving customer service. As seen in Figure 18, 86 percent of the respondents indicated their agency's online services resulted in multiple benefits. The vast majority of respondents (91 percent) said online services had enhanced customer service, and 86 percent said online services also increased efficiency. Just over half of the respondents (68 percent) saw costs savings due to the implementation of online services.

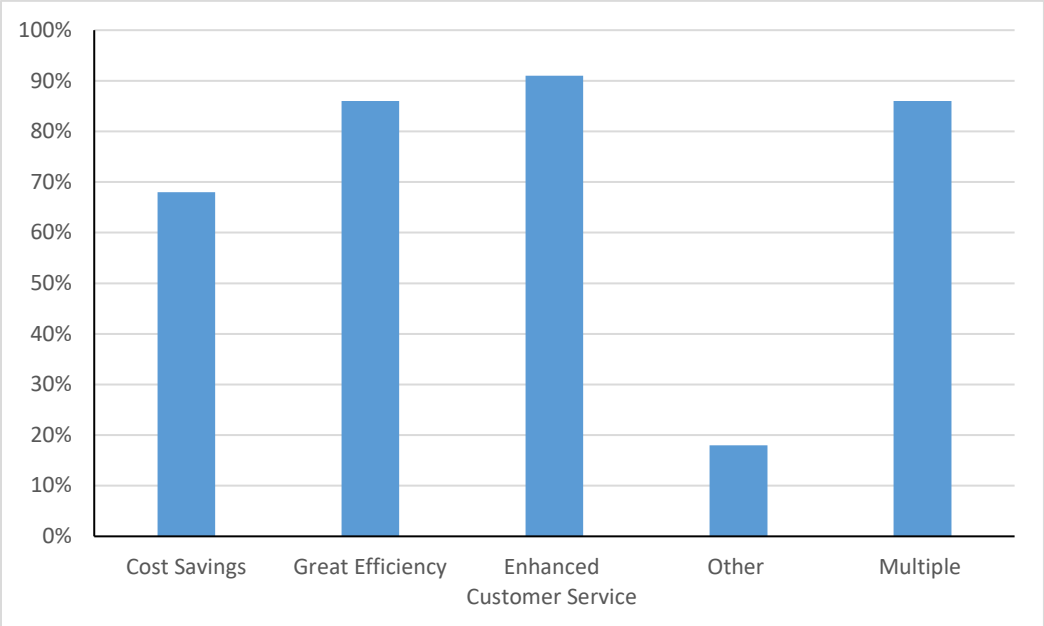

Figure 18. Benefits of Online Services

ADOT's respondent commented that because citizens can review their service history online, the state was able to improve fraud detection and prevention in DMV services. Several DMV administrators also noted decreased traffic in their branch offices as well as shorter wait times for customers. Agencies in Florida, Georgia, Rhode Island, and South Carolina experienced shorter wait times and fewer customers making in-person transactions. South Carolina's respondent said this improved the customer experience in their branch offices. Florida and South Carolina administrators also said their agencies reduced the amount of office resources and therefore cost needed to operate branch offices.

New Mexico administrators said their DMV saw the additional benefit of fewer people making citation payments and renewing registrations by mail. However, it continues to struggle with the cash-based transactions that persist at state DMV field offices.

In some states, customers were slow to adopt online DMV services. Wisconsin has seen an increase in usage rates since online services were introduced. The respondent from Wisconsin noted their online applications are easy and quick to use, which lets customers use its mobile services at their convenience. Wisconsin is particularly proud of the responsive design of online applications, which has helped increase usage rates.

Merchant Fees for Online Services

Fifty-five percent of respondents said their agencies fund online service development and maintenance through user fees such as fees for service, convenience fees, or fees for credit card transactions. In many cases, these fees finance service merchants or third-party contractors who maintain the state's online services. States contract their e-government services to third parties, such as NIC, because it is more cost-efficient than the self-funded model, which requires significant resources and legislative appropriations (Center for Public Policy and Administration, 2012).

Despite online services offering greater convenience, customers in some states have been slow to adopt DMV online services. A review of e-government literature also found that there are many reasons why customers continue to use in-person visits to conduct business with motor vehicle agencies. For example, customers may prefer the personal interaction with customer service agents, they may not trust the security of online transactions, or they may find the online services to be difficult to use.

We were interested in knowing if user fees might also be related to the adoption rates of online services. Question 9 asked respondents if their state absorbs merchant fees for any online services. The question also asked the respondents to indicate whether they felt absorbing or not absorbing fees impacts adoption rates for online services.

Only 33 percent of the state motor vehicle agencies absorb the merchant fees of their online service transactions. The vast majority of the respondents (67 percent) indicated their states do not absorb the merchant fees for online services (Figure 19).

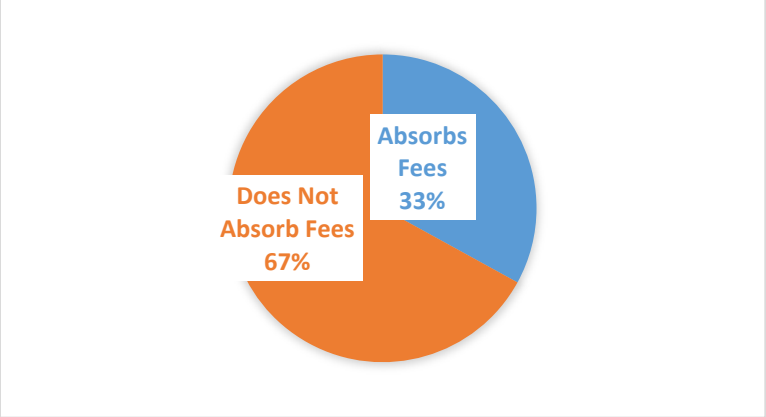

Figure 19. Merchant Fee Absorption for Online Transactions

South Carolina and Arizona's online services are based on a cost-neutral model. In the cost-neutral model, the service costs the same regardless of whether the transaction occurs in-person or online. ADOT's survey respondent said they absolutely link the utilization rates to the cost neutral model.

However, other states do not see a link between service fees and adoption rates. Respondents said most customers view the service fees as a fair tradeoff for the convenience of online transactions. Florida's respondent said customers usually do not mind the convenience fee for online services, and Rhode

Island's respondent also said the fees do not affect the adoption rates. New Mexico has passed a merchant fee on to the customer since 2004 and it has increased from $1.25 to $1.55 since then. However, New Mexico also offers incentives to customers that may increase adoption rates. New Mexico recently adopted a statute which provides a 5 percent discount on the base fee to customers who renew their vehicle registration online.

Recent Additions to Online Services

It was clear from the survey responses that state DMVs are constantly improving their online services to better serve customers. Question 10 asked respondents to describe any recent additions to their service offerings. Based on the 15 responses to this survey question, states are expanding the functionality of DMV or DMV-related websites.

Arizona recently implemented enhanced identity authentication on its portal, including biometrics and three-factor authentication. As a result, the state can now offer eTitle transfer between private parties as well as the Permit Test @ Home. The Permit Test @ Home lets teens take the driving knowledge test remotely. The exam is proctored by a parent or legal guardian. These new online services help decrease the number of in-person visits to their branches.

States have also modernized their systems. Florida is currently modernizing its online service portal. The new MyDMV Portal will allow customers to create an account and is going to provide more services online. Rhode Island's system modernization opened online services to additional customers who were previously unable to use online services. Washington State is developing a system comprised of three portals: one for driver license activities, another for vehicle registration activities, and a business customer portal. All three portals will be able to interface with each other and act as a single system for customers.

Some states have added services which help customers better navigate DMV processes. Maryland created an online checklist for REAL ID. New York's DMV launched a *Registration Document Guide* last spring to help customers identify what they need to bring to the DMV to register a vehicle, boat, snowmobile, or trailer. The guide complements the *License, Permit Non-Driver ID Guide* that the DMV initially launched in October 2017.

Respondents also discussed efforts to reduce wait times in their branch offices. Mississippi administrators added online scheduling to reduce on wait times. Ohio's virtual online customer queuing system lets customers schedule an appointment at local deputy registrar license agencies to hold a place in line. In addition, North Dakota and West Virginia have deployed motor vehicle kiosks to decrease foot traffic in branches and increase the convenience of customer transactions. Virginia has recently added enhancements to the online driver license renewal and replacement transactions by adding an online wizard that allows customers to better facilitate in-person REAL ID transactions. The SCDMV is always searching for ways to improve efficiency by encouraging customers to complete their DMV transactions online versus at a branch office. Recently, SCDMV made collision reports available for purchase online. Previously, this was a transaction only available by mail or in-person. In addition, SCDMV is developing a portal for eye exam results to be entered via the website. This will allow eye care professionals to enter

eye test results electronically so that customers can renew their license online instead of visiting local offices.

Kentucky was the only motor vehicle agency to discuss new services specific to commercial vehicles or motor carrier services. Kentucky recently deployed the myCDL Portal, which lets CDL holders and CDL applicants submit CDL applications, self-certifications, and medical certifications electronically. This has helped the Division of Driver Licensing adapt to staffing shortages, meet federal timing requirements for record updates, and provide additional convenience to CDL holders, applicants, and motor carriers.

During South Carolina's 2020 legislative session the agency is looking to amend current statutes so that courts will be able to accept DMV documents printed with watermarks as a certified document for court purposes. This would allow customers to print items from the website and use them for official court purposes. Current statutes require these documents to be stamped as official by a DMV representative at a Branch Office.

Some of the additional features that respondents introduced allow customers to check the status of credentials. Texas applicants who are pending issuance due to the Systematic Alien Verification for Entitlements (SAVE) program can now check the status of their SAVE verification online. The SAVE verification is a program that enables government agencies to verify immigration status or citizenship. South Dakota recently added a feature that lets customers check the status of their driver license. This has helped improve customer satisfaction. Texas administrators now allow customers to purchase their driver license record online, after which the customer can view it online, email it, or print it. Texas driver license and identification card holders can now update emergency contact information online between transactions.

Future Services

We curated a catalog of online services offered by the transportation and motor vehicle agencies engaged in driver, vehicle, and motor carrier services in all 50 states. However, our team also wanted to get an idea of the types of services states intend to implement in the future and identify ways that states are expanding their e-government capabilities. Question 13 asked respondents if their agencies have plans for future services that are expected to yield significant benefits. Seventeen jurisdictions responded to this question, although not all of those states have plans to implement new services in the future. Illinois, Mississippi, and New Jersey do not have current plans to expand their service offerings. Florida, Maine, and New York are currently modernizing and redesigning their systems to provide more services online. Maine is working with a consulting firm to obtain a written assessment for system modernization. New York's DMV is in the process of redesigning its MyDMV portal. Rhode Island hopes to add additional new services in the next one to two years to continue to allow customers to access DMV services at their convenience. Washington State is developing a single system that can be used for all customer transactions. Washington State anticipates this project will take 10 or more years to complete.

Respondents from Arizona and South Carolina provided detailed information about planned additions to their web services. Arizona's new account-based citizen portal will be greatly expanded in the coming months to include more services and capabilities. The state anticipates increased adoption rates following implementation. The new portal includes a citizen dashboard with a summary of credentials and vehicles, a secure message center, a document center to upload and store documents, e-signatures, service history, financial account, a citizen-managed security and privacy center, electronic refunds/disbursements, address/contact information management, and other features.

SCDMV rolls out five to seven new online transactions and capabilities per year to improve public, business, and law enforcement experiences. It is planning to implement virtual customer assistants via chatbots to support online processing. In addition, SCDMV is considering the addition of native mobile applications specific to business and public users to enhance the customer service experience. SCDMV is also in the research phase of kiosk implementation. Kiosks will be installed in non-DMV locations such as grocery or convenience stores.

Some future state projects are specific to the commercial vehicle processes. Wisconsin is collaborating with Alabama to create an automated IRS 2290/HVUT verification system. Once this is complete, the state will be able to expand the usage of online title/registration for heavy trucks. Customers will also be able to access online IRP credentials anytime free of charge as well as process multiple replacement motor carrier credentials with a single transaction. Other plans include automated email for transactions completed in motor carrier systems and the ability to pull all reports in Microsoft Excel format rather than PDF format. SCDMV is examining workflow engines that can help customers, primarily Motor Carrier Service (MCS) customers, navigate the complexities of MCS management.

Other states did not provide detailed answers, but their responses relayed basic information about the steps agencies are taking to increase the number of services they are offering. Kentucky is looking at adding online renewal for driver's licenses and personal IDs. New Mexico is developing a pre-application for drivers which enables them to go online, make an appointment, and fill out information online before an in-person visit to a DMV branch.

Responses aligned with the findings of our literature review. Agencies are motivated to increase their online and mobile technologies to improve the customer service experience, decrease in-person visits, and encourage civic participation by the public. According to South Carolina's respondent, offsite kiosks should reduce the need for customers to visit branch offices. The purpose of expanding Arizona's self-service functions is to reduce the number of in-person visits at field offices and improve citizen engagement. New Mexico's pre-application service will let customers complete part of the application process by the time they arrive at the branch office. Virginia is adding more self-service features and eNotifications with a focus on the mobile environment. In addition, Wyoming plans to issue digital titles and implement electronic lien processing in the near future.

Conclusions

The AAMVA survey responses and subsequent analysis helped us identify trends and general practices regarding online web services. First, states are using a combination of internal and external sources to develop their online service components, including websites, architecture, and software. Most of the maintenance services for online service components are performed by internal IT personnel. However, states are using third-party external personnel to develop and maintain payment engines.

The survey also inquired about the development and deployment of mobile smartphone applications for DMV-related services in light of increased consumer reliance on smartphones to access services and information. Respondents indicated that their agencies not placing a significant emphasis on developing separate mobile applications. Instead, agencies are developing websites compatible with phone-based web browsers. Ninety percent of states have websites compatible with iOS and Android, which are the two most common smartphone platforms.

Research has shown that e-government and online services greatly benefit state governments. State DMV administrators indicated many benefits in their responses. Respondents said their agencies have improved customer service, increased efficiency within their agency, and realized significant cost savings. Several states noted online services reduce the number of in-person visits to branch offices, which is clearly a top priority for several state agencies with limited resources.

However, research has also shown e-government is quite expensive and states must determine how they will fund e-government project development and maintenance. Most survey respondents said their agencies use a combination of funding sources for their web services. The most common funding sources include user fees and general budget appropriations. We were curious as to whether user fees might affect the adoption rates of online web service. Several respondents said their agency's customers were comfortable paying fees given the increased convenience. Other states use various incentives to encourage the use of online services. Four states provided detailed statistics on the adoption rates for online services. There is no consensus about the impact of fees on adoption rates, but adoption rates are climbing even in states assessing fees for common DMV services adoption.

Finally, state DMVs have significantly improved and expanded their service offerings. We identified several trends for these service enhancements. State DMVs are developing online services that reduce in-person visits to branches so there are more options to complete tasks without visiting the local DMV. This includes driver license and vehicle registration renewal as well as at-home written driver tests. States are also offering online DMV appointment scheduling to shorten wait times at agency field offices. Other states have introduced online services that help customers navigate DMV processes, such as obtaining a comprehensive list of documents required to obtain a REAL ID when visiting the nearest SDLA. State agencies are also modernizing their systems to make future system enhancements less burdensome.

Chapter 6
Idaho DMV Customer Satisfaction Survey Results

Analysis of Survey Responses from January 2011 to June 2019

Since 2011, ITD has routinely conducted customer surveys focused on available online DMV services. The following analysis is based on data collected from January 2011 to June 2019, but with 2016 data excluded (2016 responses could not be located at the time of analysis). On average, 190 customers completed the survey every month.

The surveys contained both multiple-choice questions and open-ended questions. The six multiple-choice questions were placed before the one open-ended question, which asked for customer input on how to improve the quality of the ITD DMV website and the services provided on it. The multiple-choice questions asked about visit frequency, the purpose of the visit, whether the information needed was acquired, the respondent's opinion about the appearance and usefulness of the website, and the overall customer satisfaction level. Specifically, the multiple-choice questions were:

1. How often do you visit the site?
2. Which features have you used? (Check all that apply)
3. Did you find the information you were looking for?
4. How would you rate the appearance of the web site?
5. How would you rate the usefulness of the web site?
6. How would you rate your experience with the web site?

The survey's final question asked respondents to explain what kinds of features and services ITD could provide to improve their experience with the ITD online services. Specifically, the question asked:

7. How can we make our website more useful? Let us know what features you'd like to see offered, etc.

Frequency of Usage

When the survey was posted in 2011, only 15.20 percent of the respondents answered that they visit the website once a year. Over the following years, the percentage of respondents indicating that they visit the website once a year steadily increased to almost 30 percent. The second column of Table 13 shows that nearly 30 percent of respondents said they were making their first visit, meaning that more customers were locating and utilizing ITD services throughout the survey period.

Table 13. Frequency of Visit (Percentage of Annual Total)

Year	First visit	Once a year	Twice a year	Four times a year	More	No answer
2011	21.01	15.2	15.75	4.92	3.46	39.66
2012	35.83	23.38	25.18	7.99	7.11	0.51
2013	33.05	25.78	25.49	8.01	6.82	0.84
2014	32.52	27.01	24.05	10.12	6	0.29
2015	28.05	29.8	26.92	7.98	6.69	0.57
2017	30.59	29	23.17	8.59	8.32	0.32
2018	30.68	29.61	22.31	7.83	9.21	0.36
2019	30.22	29.25	23.91	8.98	7.65	0
Total	31.7	26.25	24.18	8.24	7.02	2.61

Features Used

The second question was included to help DMV administrators determine which major customer services the respondent used on ITD's website. Respondents could choose one or multiple services from the 15 services provided as examples, and many respondents often chose more than one service as the features they used. The four most frequently used functions are recorded in Table 14. Until 2018, more than 50 percent of the visits were to complete online vehicle registration renewals. Considering that most vehicle owners are required to renew registration annually in Idaho, it is reasonable to assume most customers — particularly those who indicated that they visit the website once a year — may do so to take advantage of the online vehicle registration renewal service.

Approximately 10 percent of the website users visited the website to find forms/applications. The website posted numerous forms for the general public to download and fill out, including vehicle titling forms, tax exemption forms, dealer/salesperson forms, and special license plate application forms. Some of the forms are offered online so customers could fill them out at their convenience and then file it via mail, email, fax, or take them to a nearby DMV office. Also, a similar percentage of respondents checked out the website to locate a DMV office. Just over five percent of respondents visited the ITD DMV website to obtain handbooks or get information.

Services used by a sizeable group of people, but not included in the top four frequently used services are special plates ordering (4.61 percent), driver's license reinstatement (3.86 percent), free driver license status check (2.67 percent), and driving record request (2.39 percent).

Table 14. Frequently Used Features on ITD Website (Percentage of Annual Total)

Year	Registration Renewal	Forms / Applications	Locate DMV	Handbooks / Information
2011	51.67	15.98	9.36	4.34
2012	58.74	8.72	8.7	5.27
2013	57.26	9.38	9.21	5.2
2014	56.99	9.57	8.41	5.26
2015	53.38	10.09	9.56	5.91
2017	50	9.46	9.66	5.45
2018	50.23	11.03	10.92	5.48
2019	46.74	10.51	10.16	5.82
Total	54.57	9.97	9.32	5.35

Availability of Information in Need

During the past 8 years, over 90 percent of the respondents indicated that they successfully located the information they were looking for on the website (Figure 20). The consistently positive reviews reflect the quality of service provided on the ITD website, but it is worth mentioning that an increasing number of respondents marked that they could not find the information they were looking for over the survey period. The negative response has increased steadily from 1.13 percent in 2011 to 8.85 percent in 2019.

The general public is getting more accustomed to online transactions in the private sector and expect government agencies to make certain services available online. For example, online vehicle registration renewal became a service that every DMV or vehicle services agency in the United States offers with the exception of a few counties. The reason for the negative responses to this question may stem from the rising user expectations for online services the public sector provides. We cataloged and analyzed online services provided by DMVs in each state, and Idaho is ranked 20th based on the number of online services it offers (See Chapter 3 for details). The number of services ITD provides is above the national average, but it is becoming obvious that the expansion of online services is necessary to keep up with customers' rising standards for DMV online services.

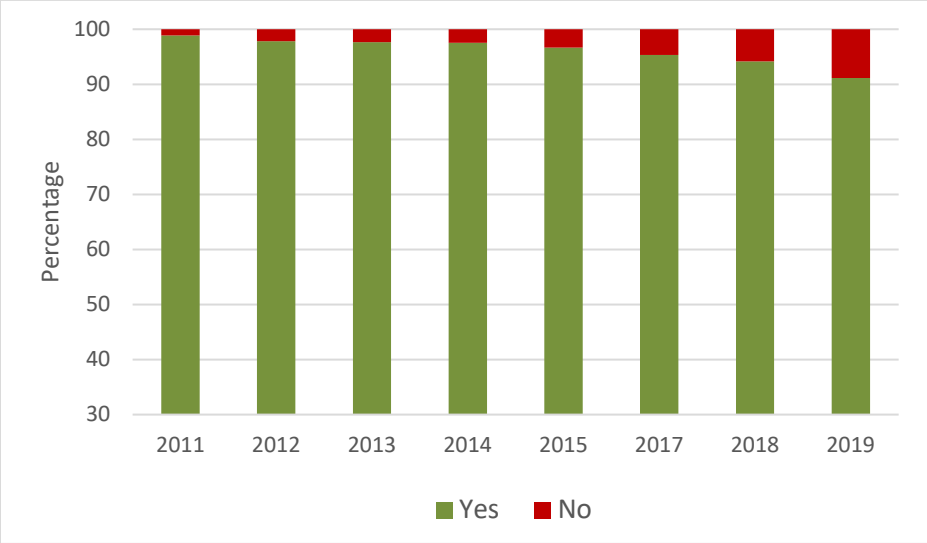

Figure 20. Survey Result on Availability on Information Needed[1]

[1] The y-axis on the figure 20 starts with 30 percent instead of zero as a way to show the increasing negative response to the survey question. The percentage of the negative response was relatively small compared to the positive responses, which made it hard to visualize the increasing trend with a y-axis origin of zero.

Appearance of the Website

This question asked the customer's opinion on the appearance of the website. Figure 21 reports whether customers rated the DMV website appearance as "Excellent," "Good," "Fair," or "Poor."

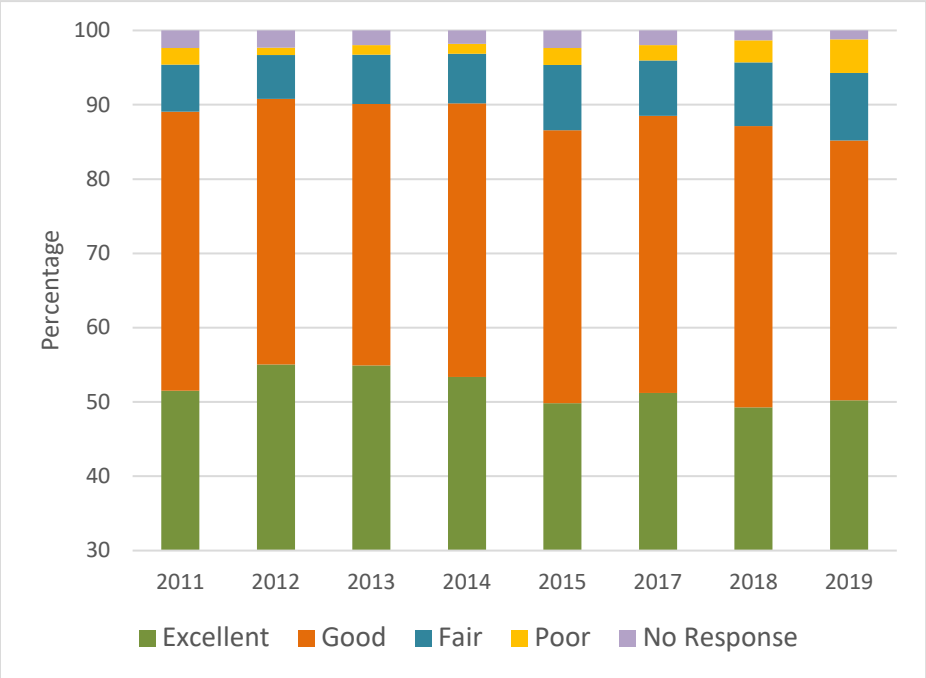

Figure 21. Survey Result on Appearance of the Website[2]

The result shows a similar pattern as the responses to Question 2. The rate of positive opinions is overwhelmingly higher than negative opinions. However, the percentage of customers indicating that the appearance of the website is poor has increased steadily.

Usefulness of the Website

Evaluating website design could be different from assessing a website's usefulness because respondents tend to focus on the style of a webpage (e.g., colors, feel, graphics). Table 15 encapsulates the responses to the question "How would you rate the usefulness of the web site?" Over 90 percent of respondents rated the usefulness of online services as "Excellent," "Good," or "Fair" 2011. The rate of positive reviews stayed above 90 percent for the entire survey period. However, it is worth mentioning that strongly positive opinions ("Excellent") fell while negative opinions ("Poor") increased. The responses to this question should be interpreted alongside Question 3 (availability of information). If a user could not find specific information after visiting the ITD website, the person would rate the usefulness of the website poorly. Also, if a user failed to complete a transaction due to the lack of the online services, the complexity

[2] The y-axis on the figure 21 also starts with 30 percent to visualize better the changing composition of "Excellent", "Good", "Fair", and "Poor."

of the transaction, or an error hampering the process, it is more likely that they would have given negative feedback.

Table 15. Usefulness of ITD Website (Percentage of Annual Total)

Year	Excellent	Good	Fair	Poor	No Response
2011	59.89	31.96	4.8	1.23	2.12
2012	62.22	29.85	4.93	1.18	1.82
2013	63.15	28.58	5.02	1.61	1.64
2014	62.87	28.29	5.35	1.64	1.85
2015	58.88	30.37	6.43	2.32	2.01
2017	58.06	29.9	7.42	3.23	1.38
2018	55.68	30.92	7.78	4.01	1.61
2019	54.13	29.73	8.62	5.7	1.82

DMVs have made efforts to add more information and online services on their website, simplify the transaction process, and reduce system errors to meet the demands of their customer bases over the years. The incremental changes may be undetected by the public, but when the entire DMV website is rebuilt reflecting modern web design trends and keeping up with customers' needs, the perception of usefulness will improve For example, Arkansas completely rebuilt its DMV website and launched a new one in 2018 to help customers avoid a trip to the DMV offices in the future. The Arkansas DMV not only expanded available online services, but also improved the appearance of the website to make it easier to navigate and find services.

Overall Customer Satisfaction

The final multiple-choice question asked about the general satisfaction level with the online services the respondent used. The results in Table 16 show that most customers have been satisfied with the service throughout the survey period. For the entire survey period, the percentage of the responses indicated "Very Satisfied" did not go below 64.08 percent, which was the lowest percentage marked in the year 2019. The highest percentage of strongly positive responses was recorded in 2012, which was 73.42 percent. In the same year, only 2.23 percent of respondents expressed a strongly negative opinion. However, 6.55 percent of respondents said that they were very dissatisfied with ITD online services in 2019, the year with the lowest strongly positive response rate. Over the survey period, the percentage of

people indicating a strong level of satisfaction has fallen, while the number of people who reported strong dissatisfaction increased.

Table 16. Overall Satisfaction (Percentage of Annual Total)

Year	Very Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Very Dissatisfied	Don't Know	No Response
2011	69.83	20.45	5.14	2.35	0.56	1.68
2012	73.42	18.99	4.05	2.23	0.48	0.83
2013	73.41	18.02	4.28	2.77	0.42	1.09
2014	72.68	18.58	4.31	2.63	0.66	1.15
2015	68.81	20.23	5.71	3.4	0.62	1.24
2017	65.75	21.85	6.04	4.14	1.06	1.17
2018	64.95	21.35	6.46	5.74	0.6	0.9
2019	64.08	19.3	7.77	6.55	0.97	1.33

Open-Ended Question

The final question asked respondents how to make the ITD website more useful and what features they would like to see. Many respondents' notes explaining their experience with ITD online services help us understand the reasons why some are dissatisfied. Due to the complexity of analyzing open-ended questions, this analysis focused on answers recorded in 2019. From January to June, 824 respondents participated in the survey and 379 comments were collected (a 46.00 percent response rate).

Among the respondent provided comments, 22.70 percent (86 respondents) said that the website is user-friendly, simple, and convenient, and the most positive notes were related to the online vehicle registration renewal service. Customers mentioned that they could avoid a trip to the DMV offices, avoid standing and waiting in a long line, and renew the vehicle plate registration tab electronically, thereby avoiding the expiration date deadline. Moreover, some respondents explained they have difficulties visiting a DMV office and expressed appreciation for the online services.

Among the negative comments, fee-related complaints dominated. Many argued that DMV should not charge any extra fee for online transactions (i.e., the convenience fee) considering the lessened workload at the DMV offices. Another group of people requested clearly written pricing information at the very beginning of any online transaction so they would not waste their time entering personal information and be discouraged by the extra cost afterward. Also, several respondents disliked the extra fee on credit card transactions and asked to add other forms of payment (e.g., PayPal).

Another group of comments focused on the lack of services. Customers would like to see more information, forms, and online services available in general. Those frequently mentioned include a more mobile-friendly website and development of a mobile application, being able to renew registrations for multiple vehicles at the same time, using a status check for the vehicle registration renewal tab (common complaints included delayed delivery of the tab), and making more groups of people eligible for driver license renewal and the change of address service. Also, it is worth noting that 19 respondents showed discomfort with the slow processing time, frequent error messages, and hyperlinks that resulted in a *server not found* message.

Chapter 7
Online Address Change Survey

Introduction

KTC researchers created a survey that contained seven questions, including both multiple-choice and open-ended questions. Researchers developed the questions and submitted them to ITD DMV staffers for feedback and approval. Once the questions were approved, an ITD representative sent the survey questions to AAMVA, which were disseminated through its online survey tool. Fifty U.S. states and 13 Canadian provinces were invited to participate.

Having the option to change addresses online can potentially result in fraud. Given the importance of motor vehicle agency databases, it is critical to verify that all data submitted to motor vehicle agencies are secure and accurate. The purpose of the survey was to assist ITD in minimizing the risk of fraud by anticipating and identifying system vulnerabilities related to an online change of address. The survey contained questions about online address change policies for motor vehicle agencies. In jurisdictions that offer an online address change feature for customers, the survey asked respondents to indicate specific online services that include this feature (or can be used in conjunction with a standalone electronic address change module) and requirements for submitting an address change. KTC researchers and DMV administrators were also interested in whether states require proof of address to submit an address change as well as the types of proof required. Furthermore, the survey queried participants about methods used to detect and prevent fraud associated with online address changes. After the survey responses were collected, KTC researchers analyzed and summarized the results. This summary also includes a detailed analysis of online address change service adoption rates submitted by respondents from Virginia.

Twenty-five U.S. states and Canadian provinces submitted responses — a 40 percent response rate. Participating and non-participating jurisdictions are mapped in Figure 22. Jurisdictions shaded blue submitted a reply, while states and provinces that did not submit a survey response are shaded white.

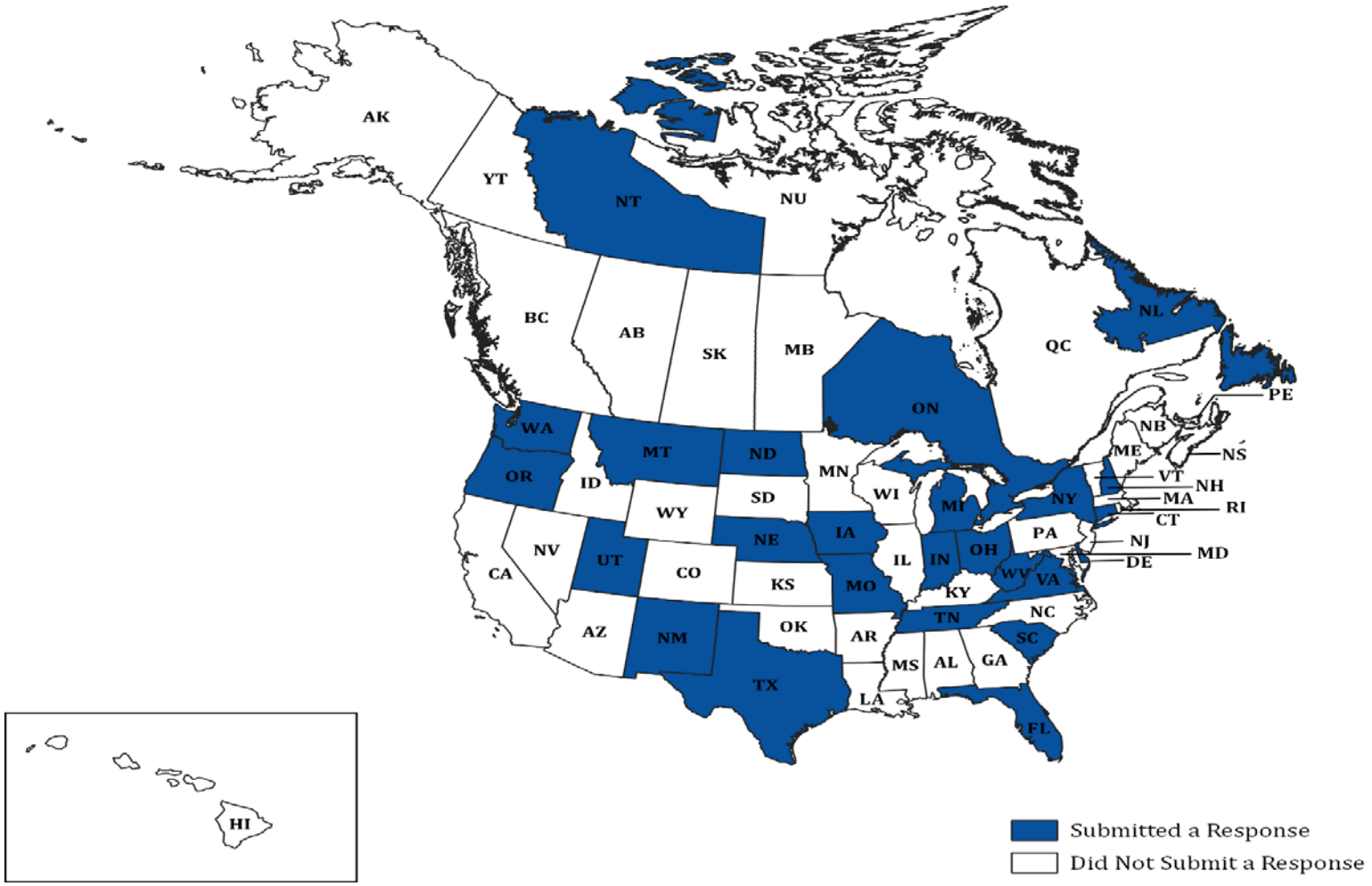

Figure 22. Survey Participation

Motor Vehicle Agencies and Fraud Prevention

As online motor vehicle agency services become commonplace, there is an increasing demand for various online service options. Submitting online address changes for a driver's license or vehicle registration/title is one of these services. As with any online service, motor vehicle agencies must balance demand for increased customer convenience and agency efficiency with the need to protect government databases from security breaches while preventing fraud.

U.S. state-issued driver licenses or ID cards play a fundamental role in citizenship that extends beyond establishing driving privileges. While a passport carries the same weight in terms of identification verification as a state driver's license, statistics show passports are much less prevalent among the U.S. population than driver licenses. Driver licenses are easier to carry, cheaper than passports, and can be obtained more quickly than the six- to eight-week wait for a passport. Only 45 percent of Americans held a valid passport in 2019 (Department of State, 2020), while 85 percent of Americans currently hold a driver's license (Hedges Company, 2020).

Most research on the primacy of driver's license and ID cards for verifying identity reference the events of September 11, 2001. Nineteen terrorists hijacked three planes which crashed into the World Trade Center and the Pentagon. A fourth plane was initially flown towards Washington D.C. before the attack was thwarted by passengers. The hijackers were able to successfully board the flights using 30 or more state-issued driver's licenses and ID cards for identification (Krajewska, 2020). As Senator Dick Durbin of Illinois argued, driver licenses are "the most widely used form of personal ID in the country"; the possession of these identity documents gave the terrorists "legitimacy," allowing them to "walk around and mingle into American society without being detected" (quoted in Krejewska, p. 4). Federal investigations of the 9/11 attacks concluded that possession of these documents facilitated the crime. As a result, the Federal government enacted the REAL ID Act in 2005 to enhance verification and security features to prevent individuals from fraudulently obtaining such a credential.

Institutions like banks increasingly rely on DMV databases to verify the identity of online depositors and loan applicants. A 2018 *Wall Street Journal* article stated that motor vehicle agencies are "appealing partners" for banks, because citizens or residents cannot obtain driver licenses without first visiting a DMV and establishing their identity through multiple documents that are verified by trained staff members (Demos and Glazer, 2018). AAMVA has even worked with bank technology vendors to expand a license verification network using DMV databases (Demos and Glazer, 2018). One Iowa Department of Transportation Director claims that their staff is routinely contacted by financial agencies to help verify applicant identity, and places within their agency's purview "identity management" as well as the establishment of driving credentials (Demos and Glazer, 2018).

Given the importance of driver licenses and ID cards, criminals may obtain those documents to facilitate illegal activities. Personal IDs or licenses can be used to falsify identities or residences. These documents can also help criminals establish a line of credit, open a bank account, and drive undetected (AAMVA, 2015). According to AAMVA's 2015 document *Best Practices for the Deterrence and Detection of Fraud,* law enforcement has linked stolen driver licenses to drug trafficking, money laundering, and drug

distribution. In some cases, criminals have made a lucrative business of selling drivers licenses for as much as $200 a card (AAMVA, 2015).

Online Address Change Availability

Respondents were asked if their jurisdiction provides an online address change feature for DMV-related services. Twenty-five jurisdictions responded to this question. Most (84 percent) jurisdictions allow customers to change their address online for at least one motor vehicle process (Figure 23). Only four jurisdictions do *not* offer this option for website users — Connecticut, Montana, New Hampshire, and the Northwest Territories in Canada.

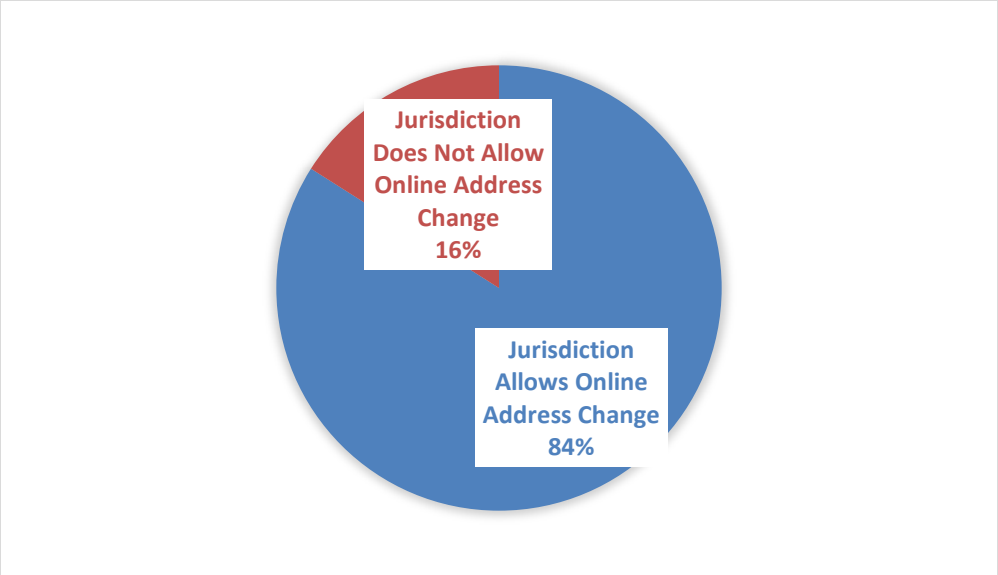

Figure 23. Jurisdictions and Online Address Change

States may limit the type of address that a customer can change online. Indiana lets customers change their mailing address online, but does not allow them to change their legal (i.e., physical location) address. In Iowa, eligible driver license or ID card holders are permitted to change their mailing address online. The address is updated in the Department of Transportation Records system, but the customer will not receive a new license or ID card until they renew their license. Customers using South Carolina's DMV online address change feature can make changes to their residential, special mailing, and temporary addresses.

Montana administrators do not let customers submit address changes via website. Instead customers must submit a mail-in form; however, the state does not require proof of the address change. In addition, customers cannot change their address in conjunction with other mail-in processes. For example, if a person is renewing their driver's license by mail, they cannot change their address as part of that process. If a customer wants the new address printed on their driver's license, the state requires them to make an in-person visit.

Online Address Change and Motor Vehicle Services

Another question asked respondents to indicate for which services customers are permitted to change their address: driver services such as licenses, ID cards, and driver records; vehicle services, including registration and titles; motor carrier services; and other services. Twenty-one states responded to this question. Eighty six percent of jurisdictions let customers change their address for driver services, while 76 percent allow customers to change their address online for vehicle services (Figure 24). A much smaller percentage (24 percent) of jurisdictions make online address change available to their motor carrier customers. Nineteen percent of respondents indicated that customers may change their address online for other motor vehicle agency services.

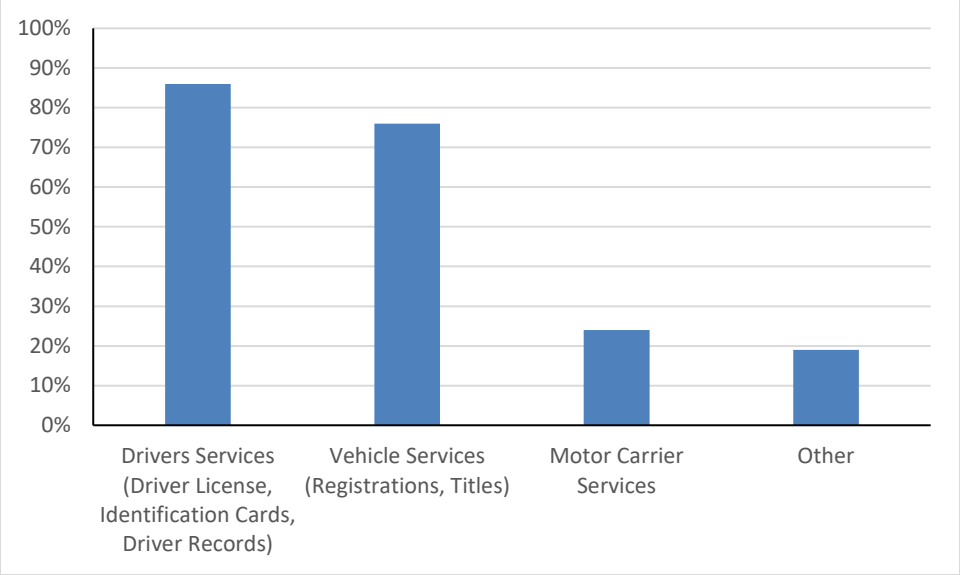

Figure 24. Services with Online Address Change Feature

West Virginia, New Mexico, and New York let customers change address information for vehicle registrations. New York and New Mexico specified that customers cannot change their title addresses online. Utah, Nebraska, Iowa, Ontario, and Texas residents can change the address for driver licenses, permits, and ID cards online. Utah does not let CDL holders change their address online. Virginia only allows individuals (as opposed to businesses) to change the address for their driver's license and vehicle registration. Motor carrier businesses are an exception, however, as those companies are permitted to submit address changes virtually.

A few other jurisdictions permit online address changes for motor carrier services. North Dakota allows motor carrier businesses to update their mailing address online; however, they must contact the Motor Carrier office by phone or email with a request to change the physical address. A mailing address for motor carrier businesses can include a P.O. box and a physical address that is the street address for the business. If a motor carrier service account is opened in an individual's name, the address must be their residence.

An individual cannot use a P.O. Box as the mailing address. Proof of address requirements are different for motor carrier business accounts and individual motor carrier accounts in North Dakota. Motor carriers must prove the principal owner is a resident of North Dakota, the owner has paid taxes in North Dakota, provide utility bills in the name of the business, and offer proof there are vehicles titled in the name of the business. An individual must show typical proof of address including utility bills, a North Dakota license, rental agreement, income tax returns, copies of vehicle titles, insurance card, medical card, or letters from the Internal Revenue Services or FMCSA.

Ontario allows a motor carrier service customer to start an address change online, but it is not considered complete until the ministry receives all appropriate documentation. A team member contacted Ontario to clarify the required documentation. Required documentation for IRP for any physical address change is the Established Place of Business and Residence Questionnaire and supporting documents. If the customer is changing an address for an established place of business, they are only required to show two supporting documents. If the customer is changing a residential address, they must provide three supporting documents. Some documents can only be used if the change involves a residential address. Permissible supporting documents include: Ontario Articles of Incorporation or Master Business License; a copy of the lease, mortgage, or current property tax; utility bill; copy of residential tax assessment (for residential address); copy of driver's license (residential address); vehicle registration documents (residential address); insurance card; or bank statement (residential address).

Oregon's DMV system uses the same address for all vehicles registered in an individual's name as driver's licenses, permits, and ID cards. When a customer changes their address, the DMV uses the new address to update license, ID, and vehicle registration records. In addition, the DMV will update voter registration information for customers if they request it.

Some respondents indicated their jurisdiction allows customers to change their address electronically for additional services not explicitly referenced in the survey. Michigan offers customers the option to update their voter registration address. New Mexico lets customers update their handicap placard address. New Mexico customers can also update their boats and vessel registration addresses online.

Ontario DMV administrators provided a more in-depth description of the province's online address change procedures. When a customer renews the license plate sticker for a passenger vehicle, the online system asks whether the address needs to be changed. If the customer chooses yes, they are prompted to update their address. An online address change application opens in a new window separate from the license plate renewal page.

Ontario residents can also change the address for driver licenses, vehicle permits, and provincial health cards online. Once the address has been successfully changed online, customers are directed to a confirmation page informing them that a new driver's license (if applicable) will be mailed out and provides an estimated time of arrival. Vehicle permits are not mailed to customers; instead, the confirmation page directs customers to bring their original vehicle permit to a ServiceOntario center to exchange it for a permit with their new address.

An exception to these policies is that an address change for residents of Northern Ontario cannot be completed online. A Northern Ontario resident may be eligible for a fee reduction or registration

exemption. For them to take advantage of this exemption, they must complete an Application for Vehicle Registration and the Northern Declaration section.

Standalone Address Changes and Changes Made During a Transaction

The survey also contained a question which asked whether customers can complete an online address change as a part of another transaction, a standalone function, or both. There were 20 responses to this question. Forty-five percent of jurisdictions let customers change their address as part of a transaction as well as during a standalone transaction (Figure 25). Thirty percent of jurisdictions only allow customers to change their address in a standalone transaction; 25 percent let customers change their address in the course of completing a transaction.

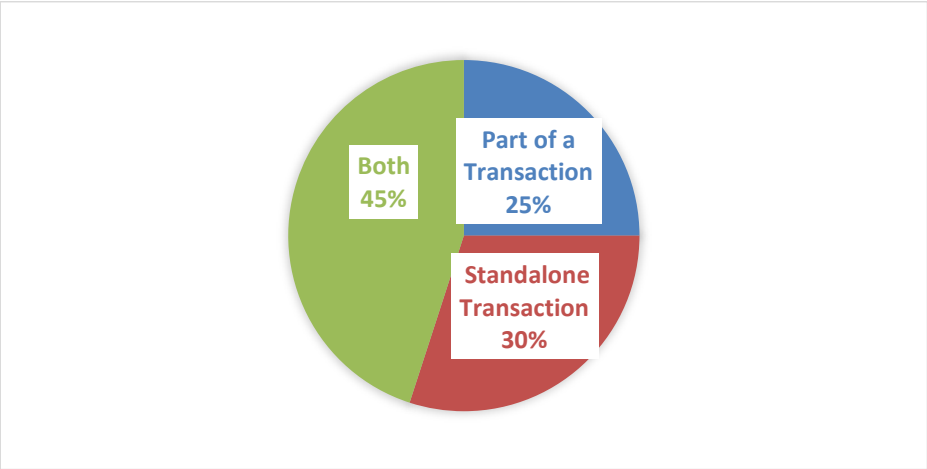

Figure 25. When Can a Customer Submit an Address Change?

Jurisdictions had the option of providing more detail for this question. In Iowa, U.S. citizens between the ages of 18 and 70 with driver licenses or ID cards are eligible to use online services. Compared to younger drivers, those over the age of 70 have shorter license renewal periods and are required to have vision checks upon renewal. These customers can change their mailing address as a standalone transaction or change their mailing/residential address during an online renewal transaction. New Mexico permits address changes during registration renewals and credential replacements or renewals. West Virginia allows customers to change their address during a registration renewal or request for a duplicate registration card.

Some jurisdictions indicated that online address change transactions must be completed in a certain order. Customers in Newfoundland and Labrador complete address changes through a standalone transaction, which must be completed first if a customer is performing multiple transactions. South Carolina customers must make an address change as a standalone transaction before processing any other transaction, otherwise the product will not reflect the new address.

Proof of Address Requirements

Online Address Changes

Two questions inquired about proof of address requirements. The first asked if the jurisdiction requires proof of address when submitting an online address change. Twenty-one jurisdictions responded to this question. Only two (10 percent) require customers provide proof of address before they are can change their address online (Figure 26). The remaining 90 percent do not require proof of address.

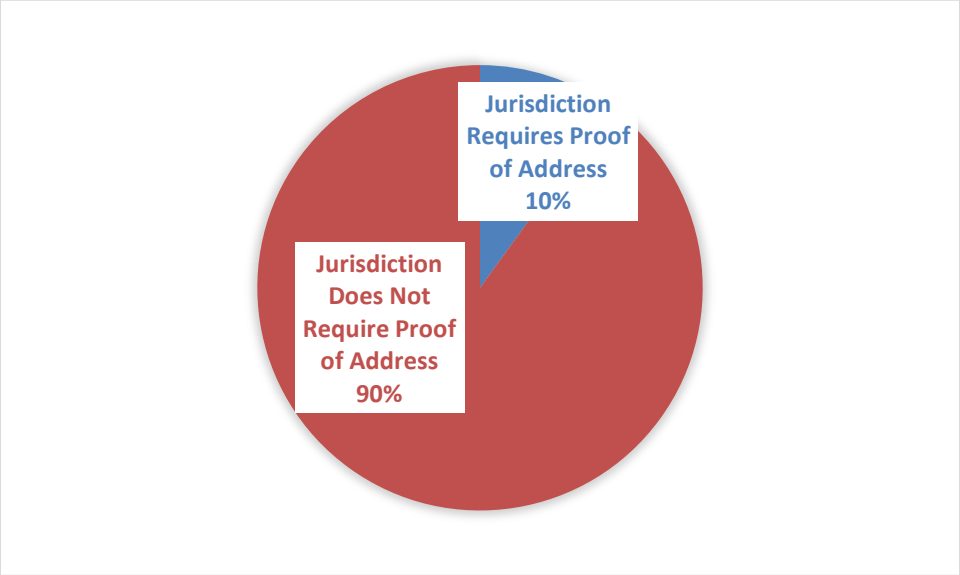

Figure 26. Proof of Address Requirements for Online Address Change

This question also asked respondents to give examples of the types of proof required by their jurisdiction for online address changes (if the jurisdiction requires it). Nebraska and Newfoundland and Labrador were the only responding jurisdictions that require proof of address for online address changes. Newfoundland and Labrador allows customers to submit address changes and proof of address documentation by email. Nebraska requires the same principal address requirements as Real ID. A principal address conforms to the jurisdiction's residential requirements for driver licenses or ID cards. REAL ID requires two documents that contain the individual's name and principal address. Once the customer submits their change of address and the proof, a staff member digitally verifies the proofs of address. Nebraska allows customers to upload their proof of address to the online system.

Customers in Newfoundland and Labrador must show proof of residency. An agency employee confirms that proof was provided by the customer. Sufficient proof includes a valid document that (1) confirms the mailing address as indicated by the customer; and (2) indicates a valid address in the province. Acceptable proofs of address include a utility bill, a telecommunications bill, rental or mortgage document, municipal correspondence addressed to the customer, payroll/employer's correspondence, or other documents deemed acceptable to the Registrar.

Since Indiana does not permit customers to change their legal (physical) address online, it does not require proof of address when a person changes their mailing address. Oregon only requires proof at the original issuance and renewal of photo ID credentials. North Dakota does not require customers to provide proof of address. However, it uses an address verification program to confirm that the address is valid.

In-Person Address Changes

The second question pertaining to proof of address focused on in-person address changes. Twenty-five jurisdictions answered this question. Most (68 percent) do not require proof of address when a customer changes their address during in-person visits, while 32 percent require proof of address (Figure 27).

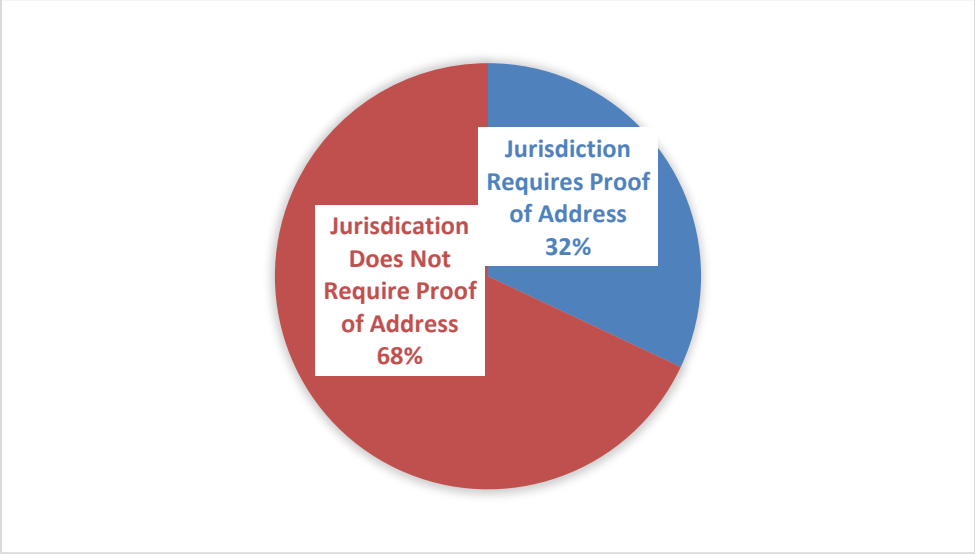

Figure 27. Proof of Address Requirements for In-Person Address Changes

The question did not specifically ask for additional information regarding in-person address changes, but several jurisdictions provided more detail. Most states require two documents. Ohio requires two acceptable documents showing proof of current address. Ohio's change of address form lists 24 acceptable document types. These documents must contain the applicant's name and their Ohio street address. Utah requires two forms of verification for a driver's license or ID. Acceptable documents include mail delivered to an address, rental agreements, and utility bills.

Some states have different address change requirements based on the type of address being changed. Indiana requires proof of address when a customer amends their legal address. Michigan also requires proof of original addresses. States also enforce different proof of address requirements for different services. For example, Utah and West Virginia require customers to present proof for driver licenses and ID card transactions, but not for motor vehicle registration transactions.

Iowa does not require proof of address for address changes submitted during another transaction. However, the state uses a verification system to confirm the validity of the address. New Mexico law

requires no proof of address for in-person address changes. Clerks are trained to verify address change applicants' photos.

Jurisdictions that do not require proof of address for address changes indicated that they *do* require them for issuing credentials. Oregon only requires proof of address when a customer is being issued a new photo credential or renewing a photo credential. Texas requires proof of address during the application process but does not require one for address change. Iowa also does not require proof of address for an in-person address change but requires two pieces of mail as proof of address during REAL ID issuance or any initial driver's license or ID issuance transaction.

Fraud Detection

A survey question asked respondents to name any policies, procedures, or verification mechanisms their jurisdiction has in place to detect and prevent fraud related to online address changes. Eighteen jurisdictions responded to this question.

None

Some states do not employ any additional security measures to prevent fraud for online address changes. For example, once an applicant establishes Delaware residency, no additional documentation is required to change their address. If the state suspects fraud, the Compliance and Investigation Unit conducts an investigation. Missouri administrators do not take additional security steps in their processes to prevent fraud. According to Missouri's respondent, if a customer reports their address was changed without their knowledge, they can contact the state. At that point a stop will be placed on the customer's record so they can correct their address to the original.

Two-Step Verification

Oregon is the only state using two-step verification. Oregon requires customers to provide personal identifiers, including the driver's license or ID number, current residence zip code, date of birth, full name, and the last six digits of the social security number. If a customer cannot provide a social security number, there is an option to indicate this. Then the system prompts them to answer a security question.

Once the customer submits the information, the system begins a two-step verification process. The customer receives a security code either by email or text message. However, the customer can choose to forgo the two-step verification. If a customer elects to disable the two-step verification, the system displays a warning which prompts the customer to select "yes" or "no" to continue without the two-step verification.

Following two-step verification, customers can choose to update their voter registration information with the new address. Customers may also select the type of address change they want to submit: update an existing address, add a new mailing address, or delete a current mailing address. Upon completion of the update, the customer provides an email address to complete the submission of the address change.

Address Verification Services

Jurisdictions also use address verification services to prevent fraud. Most use address verification services that adhere to United State Postal Services (USPS) standards. Iowa uses a verification service to ensure any submitted address is valid. In addition, customers are required to enter the last five digits of their social security number, full name, date of birth, driver's license or ID number, and the document descriptor code printed on the plastic card. Nebraska uses Coding Accuracy Support System (CASS), a USPS address verification system. The South Carolina DMV validates and standardizes address through Pitney Bowes software using USPS CASS standards. South Carolina's DMV also sends a letter via USPS advising the customer of an attempted address change showing the old and attempted new address. Oregon also verifies addresses through USPS. To screen out potential fraud, a letter requesting proof of residency/ domicile is sent to individuals who submit addresses for drop boxes.

Upload a Supporting Document

In Newfoundland and Labrador, customers must upload a supporting document for consideration by the Motor Registration Department (MRD) before the agency will process the address change or other MRD transactions. Once an employee reviews the document and verifies it, the information is updated in the record.

Personal Identifiers

Other jurisdictions rely on personal identifiers to ward off fraud and confirm identity. To change an address for a motor vehicle in North Dakota, customers are required to enter their title and plate numbers. If a customer wants to change an address on their driver's license, they enter the name exactly as it appears on the card, license number, date of birth, and the last four digits of their Social Security Number. Motor carriers can only change their address if they have an online account.

New Mexico requires customers to enter personal identifiers to prevent fraud. When a customer wants to update their address online, they verify their driver's license number and date of birth. In addition, the customer is required to indicate the type of proof of identity as well as a portion of the proof of identity number or sequence that was last submitted. Those may include social security number, Matricula Consular (an identification for residents of Mexico), passport, or Individual Taxpayer Identification Number (ITIN). The customer must also be able to provide the last four numbers of that proof of ID number on that document. To change a vehicle address, the customer provides one of the following: the full vehicle identification number (VIN); the control number shown on the reminder renewal postcard; or the VIN's last six characters, with the license plate number and the zip code of the residential address of the vehicle. CDL holders cannot update their address online.

New York and Ohio also require personal identifiers. New Yorkers provide their name, date of birth, document number, zip code, the last four digits of their Social Security Number, and an email address. Ohio residents provide their driver's license or ID number, date of birth, first letter of their last name, and the last four digits of the Social Security Number.

Uniquely, Ontario customers must provide information from their current provincial healthcare card because the address will be updated in the healthcare card database. Customers must also bring a valid driver's license number and a complete residential and mailing address.

Series of Questions

Some jurisdictions require customers to answer a series of identifying or security questions before they can submit an address change online. Florida address change applicants must answer a security question before they can access online services. Texas drivers submit the audit number from the last driver's license or ID card issued. In Texas, if the customer cannot provide that information, they must pay an additional fee and answer a series of personalized security questions to access their account and change their address.

Only Virginia specified that customers must have a password-protected online account before they can change their address. To establish the account, they first verify their identity with a DMV employee. Upon verification they receive a temporary personal identification number which lets them create an online account. The customer can also use the online self-service function by entering their customer number and date of birth, and then answering questions about their DMV account.

Customer Usage Statistics and Data

We were interested in knowing if any jurisdictions compile data related to customer use of online address changes. Seven jurisdictions responded to the question, including Missouri, Nebraska, Newfoundland and Labrador, New York, Ontario, Oregon, and Virginia. Respondents were given four possible metrics for measuring usage statistics for their online address change feature (Figure 28). Fifty seven percent track multiple metrics for usage rates. All jurisdictions track the percentage of customers who use the online address change feature. Three of the seven jurisdictions (43 percent) track the percentage of online transactions that include an online address change. Two of seven jurisdictions (29 percent) track changes in online service transaction utilization rates due to online address change accessibility, and the same percentage tracks the benefit or cost savings of the reduction to in-office transactions.

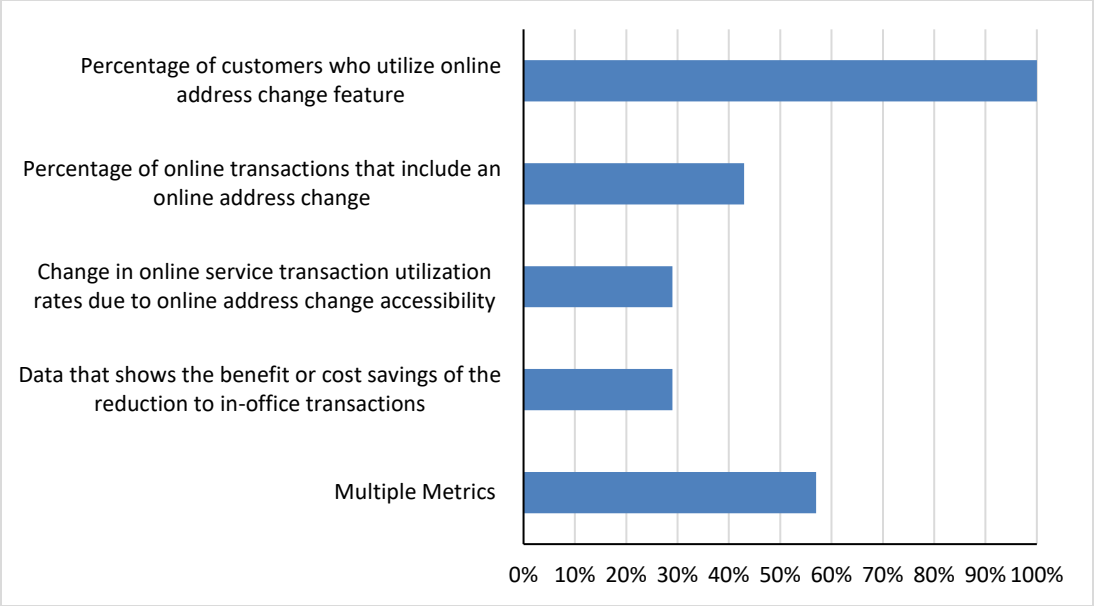

Figure 28. Metrics for Customer Usage Statistics and Data

As was the case with the other survey questions, participants had the option of providing additional data. Nebraska reported that it does not proactively compile data, but it can run reports to determine number of address changes done online if necessary.

Virginia provided extensive tracking data regarding usage of the online address change feature for its web services. The Commonwealth had 6,297,408 active regular driver licenses, CDL, and ID cards in fiscal year 2019 (Table 17). During the same year, Virginia customers submitted 1,228,687 address changes. Fifty-nine percent of those address changes were online.

Table 17. Virginia Total Address Changes – Fiscal Year 2019

License Type	Number of Changes
Active Regular DLs	5,691,053
Active CDLs	197,145
Active ID Cards	409,210
Total Credential Holders FY19	6,297,408
FY 2019 Total Address Changes	772,452
FY 2019 Internet Address Changes	456,235
Total Address Changes FY19	1,228,687

Online address changes have been used in Virginia since 1999. The Commonwealth provided data for standalone address changes completed online for its current fiscal year to date and the preceding five years (Table 18). Since 2015, over 55 percent of address changes have been completed online. Of 4,149,460 total address changes reported over six years, nearly 58 percent were completed online. Virginia does not track total online customer activity to complete an address change. An address change may have been performed in conjunction with other online transactions during their overall online experience.

Table 18. Virginia Total Online Address Changes for Fiscal Year 2015 to 2020

Fiscal Year (July-June)	Total Address Changes	Internet Address Changes	Internet % of Total Address Changes
FY 2015	621,275	383,187	61.70%
FY 2016	707,254	396,610	56.10%
FY 2017	710,345	388,811	54.70%
FY 2018	787,509	454,120	57.70%
FY 2019	772,452	456,235	59.10%
FY 2020 (July-March)	550,625	311,112	56.50%
Sum/ Average	4,149,460	2,390,075	57.60%

Virginia also tracks cost savings when a customer completes address change submissions online rather than in-person. The address change cost can include up to three different address transactions allowed on a customer record: mailing, dwelling (residence/home), and/or vehicle registration mailing. Licensed drivers are required by law to notify DMV of a change of address within 30 days from the date their address changes. Based on Virginia's 2015-16 Activity Based Costing Report, it cost $12.96 per transaction for a customer to complete an address change in-person at a customer service center (Table 19). The cost for mail and online address changes (Remote Services) was $9.45 per transaction. This resulted in a savings of $3.51 per address change—a 27 percent reduction in cost.

Table 19. Per Transaction Cost Savings for Mail and Internet Address Changes in Virginia

Description	Cost	Source
In-person" Address Change	$12.96	2015-2016 - Activity Based Costing Report
Headquarters "Mail and Internet" Address Change	$9.45	2015-2016 - Activity Based Costing Report
Benefit of Remote Services	$3.51	

Conclusions

The AAMVA survey responses and subsequent analysis helped us identify trends and general practices regarding online address changes. Most jurisdictions allow customers to change their addresses online. Driver services and motor vehicle services are the most likely to offer online address changes. A much smaller percentage of jurisdictions make online address change available for motor vehicle services. A few let customers change the address for additional motor vehicle agency services such as voter registration, handicap placards, and boats. The survey also inquired into whether customers can change their address as a standalone transaction or during other transactions. Less than 50 percent of jurisdictions allow customers to change their address as both standalone transactions and during other transactions. The vast majority of jurisdictions do not require proof of address before letting a customer change their address online, while a smaller majority of states require proof of address for in-person transactions.

Since online address changes introduce an opportunity for fraudulent activities, most of the respondents use policy or security mechanisms to prevent fraud. One state uses two-step verification for security purposes. Some jurisdictions control the type of address that can be changed online (i.e. mailing, physical, or principal) as a form of fraud prevention. Several respondents use USPS's CASS address verification standards combined with sending a letter to the old and new address to verify the address change. In other cases, jurisdictions use a combination of personal identifiers or a series of security questions to verify a customer's identity.

Motor vehicle agencies are tracking usage statistics for their online address change features, most notably the percentage of customers who change their address online. Based on statistics from Virginia, over half address changes for driver's licenses are performed online. Data from Virginia also show online address changes can be a cost saving opportunity for motor vehicle agencies. While respondents did not specifically discuss this, letting more people change their addresses online could facilitate greater use of other online services, which would theoretically result in even more cost savings.

Chapter 8
DMV Customer Satisfaction Survey Design

Introduction

Surveys have become a ubiquitous part of modern life. Both public and private sector organizations are expanding the use of customer satisfaction survey tools to improve customer relations, including state departments of motor vehicles or their equivalent counterparts. Organizations primarily use surveys to solicit feedback and improve products and services in an effort to better satisfy customer wants and needs (Beard, 2014). DMV agencies (or DMV-agency equivalents in states without a centralized DMV business model) all over the United States use customer satisfaction survey tools or other measurements to measure agency performance and determine how to better meet customer expectations.

These reports provide insights into the current state of knowledge and generally used methodologies and can be used in conjunction with other existing survey research to derive useful guidelines for state DMVs wanting to survey customers. This chapter reviews basic conceptual definitions of customer satisfaction, the findings of some recent DMV customer satisfaction studies in other states, as well as related literature pertaining to customer satisfaction research and survey methodology. Based on the literature review, we develop some guidelines that will be useful for the Idaho DMV in future customer satisfaction survey efforts.

Recent DMV Customer Satisfaction Studies and Surveys

There have been several customer satisfaction studies in recent years (Brown et al., 2015; Findley et al., 2018; Lacey, 2019; Martin et al., 2020). While many state DMV agencies do not publish the results of these surveys, others have provided them via studies, annual reports, or audit reviews. The Virginia DMV audit assessed the state of DMV operations; spending; IT accuracy, project management and security; in-person services with CSCs; alternate service options; customer wait times; and the call center and help desk (Brown et al. 2015). The call center and help desk assessment included a customer satisfaction survey that assessed customer satisfaction with DMV employees and wait times (Brown et al., 2015). Specifically, it asked external customers, customer service center employees and DMV Select employees[3] about the effectiveness of the Virginia DMV's call center. Individual customers and staffers at customer service centers reported high levels of satisfaction (77 percent extremely/very satisfied), but the DMV Select staff reported lower satisfaction levels (60 percent extremely/very satisfied, with just 2 percent extremely satisfied) (Brown et al. 2015, p. 50). While individual customers were generally satisfied with their overall

[3] DMV Select offices are partnering agencies, usually local governments and private entities who contract with Virginia's DMV, and who provide DMV transactions but are not a part of the DMV customer service center network.

level of service, just 30 percent of the call center customers were satisfied with how promptly their call was answered. In fact, 44 percent indicated hanging up during a previous attempt because they were tired of waiting (Brown et al. 2015, p. 51). The findings are corroborated by data that show DMV call times and wait times increasing. The audit authors noted at the time that the DMV should consider converting part-time positions to full-time positions to reduce vacancy rates, outsource some of its call center functions (some of which were not directly related to DMV business) to third party agencies, and to create a comprehensive plan to reduce wait times (Brown et al. 2015, 54-55).

Another study examined customer satisfaction with North Carolina Department of Transportation services, including those provided by the Division of Motor Vehicles and electronic services (Findley, 2018). The survey reached more than 2,300 North Carolinians. Nearly 85 percent of respondents approved of North Carolina Department of Transportation services, which was an all-encompassing question that included all departments and agencies, not just the DMV. Overall, 38 percent of respondents indicated having visited the DMV within the last year, with another 45 percent indicated having used its website. Specific satisfaction numbers were not reported for overall in-person DMV services, but the service attribute with the highest percentage exceeding expectations were courtesy and helpfulness, the lowest performance was for wait times (Findley et al., 2018). Respondents said reduction of wait times, overall customer service quality, and convenient hours of operation should be a focus for improvements at DMV offices moving forward. Three questions about website layout, the explanation of services offered, and the sufficiency of information provided revealed that 82 percent of respondents who had used the website in the past year were generally satisfied with each element (Findley et al. 2018). There were other questions for people based on whether they use personal vehicles, bicycles, public transportation, ferries, planes, as well as the experiences of pedestrians.

A forthcoming study from the Kentucky Transportation Center summarizes an internal survey of employees in the Kentucky Department of Vehicle Regulation (DVR; which includes the Divisions of Driver Licensing, Motor Vehicle Licensing, Motor Carriers, and Customer Service), a standalone survey of respondents who use Kentucky's online vehicle registration application, and a mixed-mode baseline and rebaseline survey of DVR customers. The Department of Vehicle Regulation (DVR) employee survey revealed that the vast majority (86 percent) strongly or somewhat agreed that the department provides a high level of customer service (Martin et al. 2020). Employees tended to rate their own division more highly than other divisions, yet overall evaluations were fairly high.

As for DVR customers, an overwhelming majority of respondents were satisfied or somewhat satisfied with the online vehicle registration renewal tool (93 percent) (Martin et al., 2020). The baseline and rebaseline surveys were designed to reach customers who access DVR services through various mechanisms – via office visits to the One Stop Shop in Frankfort or regional driver licensing field offices, calls to the Division of Customer Service Phone Center, visits to the DriveKY website, or to the Motor Carrier Portal. Customers across both surveys felt very or somewhat satisfied with the overall customer service, but there were differences across points of contact. Phone center and DriveKY website satisfaction declined slightly between the first and second survey, whereas satisfaction with the Motor Carrier Portal increased slightly. Some of the differences were possibly due to changes in sample selection (there were more individuals in the baseline sample than the rebaseline sample) and timing (surveys were

taken 18 months apart), as well as changes in the staffing levels at the Division of Customer Service phone center (Martin et al., 2020).

The Indiana Bureau of Motor Vehicles (BMV) releases an annual report that includes information on financials, specialty plate sales, new developments throughout the year, REAL ID conversion percentages, branch wait times, new initiatives, and customer satisfaction metrics. Indiana BMV customer satisfaction/ dissatisfaction questions were asked of customers using the BMV website, BMV kiosks, and in-office branches. The annual report shows about 55.3 percent of all customers responded to the question, and of those who responded satisfaction overall was 97.9 across all service points. The website (myBMV) satisfaction was 95.6 percent; kiosk (BMV Connect) satisfaction was 97.4 percent; and DMV branch satisfaction was 99.1 percent (Lacey, 2019).

Defining and Measuring Customer Satisfaction

Customer satisfaction is a somewhat nebulous concept and its measurement can be operationalized in a number of ways. In essence, customer satisfaction should measure how happy customers are with the products, services, and capabilities of a company or organization (ASQ 2019). Other survey experts have built on the basic concept by emphasizing that customer satisfaction is best understood through the lens of the individual customer experience (i.e. the totality of a customer's interactions, thoughts, and perceptions) (Qualtrics, 2019). According to Qualtrics International, a large experience management and survey tool developer, there are four key metrics that can be used to measure customer satisfaction (Qualtrics, 2019):

- *Overall satisfaction*, which is an attitudinal measure that is typically measured with questions about overall quality of a product or service, the reliability of the organization, and the extent to which a customer's needs are fulfilled;
- *Loyalty measurement*, which is an affective and behavioral measurement often measured with questions about satisfaction with a product, service, or brand; the likelihood of continued use or repurchase of a product or service; and the likelihood of someone recommending the product or service to a family member or friend;
- *Attribute satisfaction measurements*, which are affective and cognitive measures that correspond to specific elements of a product or service, including but not limited to efficiency, courtesy, knowledgeability, and usability; and
- *Intention to repurchase measurements*, which are behavioral measurements designed to determine whether or how likely an individual is to purchase an additional product or service from the organization.

These measures are designed to qualitatively or quantitatively measure customer attitudes, attachments, affections, beliefs and behaviors as proxies for customer satisfaction. The most common customer satisfaction metric in DMV surveys is a basic question of overall satisfaction or some attribute of the service. Brown et al. (2015) reported the results of a Virginia customer satisfaction survey, which asked external customers, customer service center employees and DMV Select employees about the effectiveness of their Help Desk. In the recent survey of North Carolina DMV customers, respondents were asked if they were satisfied with transportation services, along with a large number of demographic and attribute questions designed to identify the kinds of services/customers the agency is performing/serving

most effectively and those which need improvement (Findley et al. 2018). Indiana surveyed customers at BMV offices, kiosks, and on its website and asked whether they were satisfied or dissatisfied with their service.

Kentucky Transportation Center researchers conducted a detailed customer satisfaction survey of the Kentucky DVR's external customers at different points of contact — walk-ins, website users, motor carriers using a specialized portal, and the department call center — along with an internal employee survey. The survey included both questions about overall satisfaction as well as various attributes of customer service, including efficiency, courtesy, knowledgeability, and the degree to which a customer's problem was resolved, among others. All of these efforts were similar in that they are soliciting feedback from customers along the lines of overall satisfaction or particular service attributes. However, differences in survey design and methodology greatly impact the findings of these studies and the inferences researchers and administrators can draw from them.

Customer Service Survey Literature

Previous studies of both private and public sector organizations indicate that organizational processes and structure both significantly impact customer satisfaction. The structure of online commerce and customer service is of increasing importance. Localizing e-government content may yield the most significant benefits. A study of web design in India found that sites with local content had the edge on more homogenous, nationalized counterparts in terms of consumer trust, loyalty, and overall satisfaction (Dianne 2008). Another set of researchers found that a customer satisfaction intervention improved customer satisfaction, yet a store redesign of a regional retail chain had no effect (Sulek, Lina, and Marucheck 1995). The dynamics of the interaction between customers and employees will also depend on the nature of the product or service. Interpersonal relationships between the two have a greater relationship with customer satisfaction when the product or service requires the development of greater rapport between customers. The more frequent or complex the customer interactions, the more important the relationship in determining customer satisfaction (Tse and Chan 2008). In the private sector, consumer-employee relationships between clients and construction contractors or hair stylists, for example, will be more influenced by individual attributes and interpersonal dynamics because of the complexity and regularity of their interactions. Comparatively, customers and employee interactions in retail or food service products or services are typically more streamlined and irregular.

DMV agencies generally provide products and services required by federal or state law; because most of those services are one-time transactions of a standardized product — usually a license, registration or motor carrier-related tax, permit or credential. The overall satisfaction and attribute satisfaction measures are most common. Loyalty and intent to repurchase metrics based on product loyalty or longstanding client-service relationships are better suited for private-sector organizations and do not make much sense conceptually for a state agency where customers are legally required to purchase licenses, registrations, and other credentials at regular intervals. In particular, the DMV studies reviewed indicated efficiency may be the most appropriate customer satisfaction dimension for DMV-related services, particularly wait times at offices (Brown et al., 2015; Findley et al., 2018). However, the Kentucky

DVR study revealed some interesting dynamics surrounding efficiency. Customer evaluations of efficiency, knowledgeability, courtesy, or ease of obtaining information all correlated strongly with overall customer satisfaction, but in the baseline survey of call center customers there was no significant relationship between call length and satisfaction (Martin et al. 2020). The strongest predictor of a drop-in customer's satisfaction in the baseline survey was a call transfer from a front-line call center employee to a specialist in one of the other divisions.

Another key aspect of organizational structure is the status of employees. Some studies note that employee anxiety and psychological parameters of workplace environments have significant implications for employee performance (Conway and Briner 2002; du Toit and Coetzee, 2012; Jones, Latreille and Sloane, 2016). Several studies suggest that part-time or temporary employees are less satisfied than full-time employees, but this can obviously be mediated by individual attributes and organization-specific characteristics (Johnson and Ashforth 2008; Gregory, 2008; Kuratuna and Basol, 2017; Parker et al., 2016; Conway and Briner, 2002). Furthermore, employee satisfaction may have implications for customer satisfaction. In instances where customers could easily discern that an employee was a temporary or part-time, customer satisfaction tended to decline (Johnson and Ashforth 2008). DMV agency research has similarly found that insufficient staffing is a problem, and both the Virginia DMV auditors and Kentucky DVR studies found some evidence that converting part-time call center jobs to full-time jobs would help retain experienced employees and their retention would mean better results for customers due to lower wait times and a higher percentage of interactions where problems were adequately resolved (Brown et al., 2015; Martin et al., 2020).

Customer and employee attributes and behaviors are another critical component for understanding satisfaction with the products and services an organization provides. Investigations into the impacts of employee or customer demographics such as gender, race, income, and age have often shown inconclusive or complicated (even interactive) effects on customer satisfaction. A study of real estate agents in the Midwest revealed that buyer income and gender had a significant impact in the customer evaluation of various sales ethics scenarios, but also relative levels of idealism or relativism (Boyle, 2000). Studies scrutinizing the relationship between employee gender and race and customer satisfaction reveal complex realities. Heckmen et al. (2010) found that customer biases toward female and minority service employees might negatively affect customer satisfaction evaluations. However, another study found that customers of a large U.S. retail chain had higher levels of customer satisfaction at stores with a predominately minority, highly pro-service store units, whereas the percentage of female employees had no statistically significant effect (McKay et al., 2011). Another study found that age, income, expertise, and incident types influenced the satisfaction of airline industry customers, but gender and loyalty program membership did not (Sugianto, 2017). Consequently, there is no clear trend about the role that customer or employee attributes play in evaluations of customer service.

Behavioral characteristics are perhaps somewhat clearer, particularly for customers of public sector organizations. One study found that government website use is positively related to satisfaction with e-government services, and that in turn satisfaction with e-government services is positively related to trust in government (Welch, Hinnat, and Moon, 2005). Another study of a city in North Carolina demonstrated the value of a customer service intervention when a survey revealed that while citizens were generally

satisfied with most public services, they were dissatisfied with their interactions with city employees. The city implemented a training program and a customer service intervention with facilitators and collaborations with human resources management. The city resurveyed their respondents again five years later and found that its citizen evaluations had improved on all but one metric (Rivenbark and Ballard, 2012).

For DMV services, most investigations of customer satisfaction pertain to behavior or customer type rather than classic socioeconomic indicators. In particular, separately analyzing customers based on their method of transacting services or interacting with the DMV (or DMV-agency equivalent) has been a focus of many DMV customer satisfaction surveys. Walk-in customers, phone customers, kiosk users (in Indiana), and agency website users all have somewhat different priorities and needs. As noted in the Virginia, North Carolina, Kentucky, and Indiana studies, state DMV agencies tend to tailor survey questions for customers based on their experiences with in-person office visits, phone center calls, and website usage. These behavioral distinctions tend to be process dependent in most surveys, where respondents are asked different questions depending on how they utilize DMV services. In some instances, such as the Kentucky DVR customer satisfaction survey, website users were asked if they had any experiences with the phone center, and if so, were asked questions about that interaction. Demographic characteristics are less likely to be based on standard socioeconomic classifications and more focused on customer traits. In the North Carolina DMV study, the characteristics were mode of transportation (e.g., personal vehicle, public transit, bicycle). The Kentucky DVR survey asked customers to identify whether they were calling as an individual with personal business, a business representative (in most cases a motor carrier or permitting agency employee), or government agency representative.

Higher levels of customer satisfaction are associated with positive outcomes for public and private firms alike. Several studies have shown that customer satisfaction is strongly linked to profitability and customer retention, although the relationship varies greatly across and within industries (Gupta 2006). Public agencies face a different dynamic. Non-profit entities will not see higher customer satisfaction translate into profits, and given that DMVs are the sole option for nearly all products and services they offer, customer loyalty is not a matter of choice but of necessity. And DMV agencies, like most other agencies, face another challenge in that efficiency goals must be balanced by responsiveness to equity in treatment of customers (Wilson, 1989). In practice for DMVs this means that having adequate office space for all areas of the state, convenient hours, and so forth even when doing so might not maximize the efficiency of agency resources. Another challenge facing DMV agencies is employee satisfaction and turnover. A recent study of public health officials found that while most employees liked their jobs, about 40 percent said they were considering work elsewhere or retiring within the next couple of years because of dissatisfaction with compensation (Leider et al. 2016). Public agencies around the country struggle to come up with sufficient resources to compete with private sector employers, and DMVs are not exempt from this challenge. As shown in previous DMV studies, employee turnover in call centers presented challenges in both Virginia and Kentucky (Brown et al., 2015; Martin et al., 2020).

Clearly there are steps DMV administrators can take to improve customer satisfaction. First is to regularly engage in customer satisfaction surveys. Idaho's DMV has regularly provided online customers an opportunity to provide feedback, as noted by the online survey review in Chapter 5. Other states have

expanded online-only surveys, with various approaches. There is not much publicly available information about the methodologies used for the Indiana, North Carolina and Virginia studies. However, in the Kentucky DVR study researchers deployed a mixed-mode survey, which is a survey that attempts to reach respondents via multiple different survey modes, which can include a combination of online, phone, mail, and in-person formats (Martin et al., 2020). The Indiana study reached people at different points of contact with the DMV, and the North Carolina study sample included both individuals using online services and those who made office visits. Both the Virginia and Kentucky studies suggest minimizing turnover and lowering reliance on temporary employees, given that building the expertise and knowledge necessary to resolve customer issues take time. Third, adding convenient online services can increase satisfaction over time. The clearest evidence for e-government increasing customer satisfaction comes from the Kentucky DVR study, which saw motor carriers and permitting agency satisfaction with the department's Motor Carrier Portal improve substantially over 18 months as more online services were implemented (Martin et al., 2020).

DMV Customer Satisfaction Survey Design

To reach all of its customers, the Idaho DMV needs to modify its survey methodology so it can get in touch with people who do not access online services. Currently the DMV customer satisfaction survey is accessed via the agency website, which means the vast majority of respondents are using online DMV services. In effect, the survey is sampling the opinions of those individuals, but the feedback of customers who contact the agency by phone or in-person is not captured. The best approach to sampling these different customer populations is to create a mixed-mode survey with survey design parameters that accurately assess public opinion.

There are four types of errors that survey administrators must attempt to minimize: coverage error, sampling error, nonresponse error, and measurement error (Dillman, Smyth and Christian, 2014). Collectively, these comprise the total survey error, which is a useful metric for holistically assessing potential sources of survey errors and taking steps to mitigate them.

Coverage error occurs when the list or method from which the sample is drawn is fundamentally limited in some way. Any online survey of DMV customers will have a significant coverage error because it does not draw from the proportion of individuals, businesses, and agencies who do not use online services. Another way in which coverage error can manifest in DMV surveys is if the mechanism used to sample respondents has inaccurate, missing, or incomplete data. Customer survey samples from a database that includes, for example, old physical addresses, incorrect phone numbers, or missing e-mail addresses will also have some coverage error. To minimize coverage error DMV websites and administrators should routinely review contact information for all customers to ensure it is accurate and up to date.

Sampling error is the type of survey error most people are familiar. Individuals who watch or read political horserace coverage will recall the tendency of media outlets to report pollster's a margin of error. Statistical samples are meant to be approximations of populations as it is generally not feasible to poll every individual in a population. If the sampling is conducted correctly — which is to say, using probability-based samples where each member of a target population has a known probability of being chosen

(Johnson, Reynolds, and Mycoff, 2008). DMV agencies have several valid approaches they could take, but some have more drawbacks than others. Rather than relying on a simple random sample of customers in its database, Idaho DMV administrators may want to consider a stratified sample, which is a sample where customers are grouped based on one or more characteristic and sampled in proportion to the group's overall representation (Johnson, Reynolds, and Mycoff, 2008). One possibility is sampling online customers, phone customers, and walk-ins separately and in proportion to the overall customer population. Another possibility is a stratified sample of individuals, business representatives, and public agency administrators. Typically, stratified samples rely on sampling heavily from the smaller population subunits and subsequently reweighting to ensure the subsample is broadly reflective of the group.[4]

To mitigate sampling error, survey administrators should determine the necessary sample size so they have a target in mind using DMV data about walk-ins, phone calls, or online website visits/transactions over the survey period. That number and a few simple assumptions can be used to derive the necessary sample size. Most survey administrators will aim for a 95 percent confidence level, or probability the true value of a population parameter falls within a specified range. Put differently, if 70 percent of sampled customers are satisfied with DMV services and the margin of error is ±5, the survey administrator can be confident that if the survey were repeated the percentage of satisfied customers would fall between 65 and 75 in 95 percent of cases (or repeated surveys). The formula in Figure 1 can be used to derive the needed sample size. The z-score for 95 percent confidence is 1.96. If one wanted a 99 percent level of confidence, the z-score is 2.58. The higher the level of confidence (or z-score, the larger the sample needed. The standard deviation (a measure of variance in responses) will not be known pre-survey, so most survey analysts will just use .5. The desired margin of error is usually no larger than ±5 percent. If all of those numbers are plugged into the equation, and the total number of customers (N) is 10,000, the needed sample size is 370.

$$Needed\ sample\ size = \frac{\frac{Z\ score^2 * Standard\ Deviation * (1 - Std.Deviation)}{Margin\ of\ Error^2}}{1 + \frac{Z\ score^2 * Standard\ Deviation * (1 - Std.Deviation)}{Margin\ of\ Error^2 * N}}$$

One interesting aspect of the margin of error calculation is that once a sampled population reaches a certain threshold, the required sample size does not change much. Table 20 shows the necessary sample size based on selected population centers in the Boise area. These population centers were chosen to illustrate how many respondents survey analysts need to meet various margins of error. The population centers include ExtraMile Arena, Albertsons Stadium, and 2018 U.S. Census Bureau population estimates for Boise, the Boise urban statistical area, and the Boise Metropolitan Statistical Area. It also includes the

[4] Such sampling techniques are common in political surveys to reduce sampling error for minority populations (e.g. Black, Latino and Asian voters).

2018 Census estimates for Idaho. The N column reports the total population, while MOE ±5, ±4, and ±3 percent pertains to the target margin of error (denoted as MOE in the table). Note that the required sample size for a MOE of ±5 jumps modestly when moving from a population the size of ExtraMile arena to a population the size of Albertsons Stadium, and again when moving to the Boise city population level. However, the number is basically static after that. Although there is a greater spread at the MOE ±4 and ±3 levels, the increase flattens once the population approaches the size of Boise city. The takeaway is that depending on the acceptable MOE, the necessary number of respondents does not change much. A good rule of thumb is to shoot for 400 responses if MOE ±5 is desirable, or 600 responses if MOE ±4 is more acceptable. The same principle would apply to increases in the confidence level from 95 to 99 percent; the required number of respondents would also increase. However, the vast majority of public opinion surveys report a confidence level of 95 percent. If drawing a stratified sample based on point of contact for web users, phone users, and walk-ins, it would be ideal to survey at least 400 respondents in each stratum so that comparisons between groups can be made with greater accuracy.

Table 20. Sample Size for Select Populations

Population	N	MOE: ±5	MOE: ±4	MOE: ±3
ExtraMile Arena	12,644	373	573	984
Albertsons Stadium	36,387	381	591	1037
Boise City	228,959	384	599	1063
Boise Urban	349,684	384	600	1064
Boise Metro	709,845	384	600	1066
Idaho	1,787,065	385	600	1067

Another challenge that survey administrators frequently face is nonresponse error, which occurs when respondents are different from the non-respondents in a way that influences survey estimates (Dillman, Smyth and Christian, 2014). In today's environment there are many avenues to reach potential survey respondents, but people are hard to reach. According to the Pew Research Center, phone survey response rates for their surveys have fallen from 36 percent in 1997 to just 6 percent in 2018 (Kennedy and Hartig, 2019). Estimated response rates for mail, online, e-mail, and other survey types vary greatly, but in most cases only a small percentage of those sampled respond. If there are systematic differences in the attributes, attitudes, or behaviors of non- respondents relative to respondents, there will be nonresponse error.

Table 21 shows the number of DVR customers during the baseline survey and resurvey periods in the Kentucky DVR study. Customers who called the phone center were given instructions that they would receive a callback customer survey after their call. Customers were only called back once, and only individuals and businesses (not government agencies) received a callback, meaning the response rate is somewhat understated. Nevertheless, a 9 percent response rate yielded thousands of responses during both surveys and yielded a very useful survey of phone center customers. Online DriveKY customers were not directly contacted but a link at the top of the website homepage directed users to an online survey. Because the DriveKY contact method was very passive, the response rate was quite low and thus subject

to nonresponse error. Surveys where the only option is to reach individuals who actively self-select into the sample are frequently subject to non-response bias because customers who actively seek out a survey tend to have different attributes, attitudes, and behaviors than people who will only take a survey after being directly contacted and prompted to do so via in-person, e-mail, phone, or mail requests. Note that the response rate was higher the second time because the survey administrator created a pop-up ad halfway into the administration period to make the survey more noticeable. While the pop-up method did generate more responses, it may have annoyed customers and inadvertently impacted customer satisfaction ratings. A comparison of responses before and after the pop-up ad was placed showed a significant decline in customer satisfaction. The Motor Carrier Portal method was to send an e-mail blast to every motor carrier registered with the portal and using any online services. The response rate increased from 2.35 percent to 4.72 percent the second time. However, all of these surveys were potentially subject to non-response error based on the low response rate.

Table 21. Kentucky DVR Survey Response Rate

Survey Mode	Source	Baseline Customer Population	Baseline Sample	Baseline Response Rate	Rebaseline Customer Population	Rebaseline Sample	Rebaseline Response Rate
DCS Phone	Total Calls	76,585	6,964	9.09%	51,378	4,759	9.26%
DriveKY	Unique visitors	399,432	450	0.11%	134,898	598	0.44%
MCP	Registered users	52,292	1,229	2.35%	56,255	2,658	4.72%
Total	Combined	528,309	8,643	1.64%	242,531	8,015	3.30%

Measurement error is the difference between the true value of something and the survey estimate due to inaccurate answers. There are several causes of measurement error, including data collection errors, interviewer and respondent behaviors, survey mode effects, and poor question design (Dillman, Smyth, and Christian, 2014). Given the fact that most DMVs do not conduct live-person surveys and recent improvements in survey software, the biggest challenge is often survey mode effects and question design. There are several ways in which the survey analyst can introduce error via survey mode effects and question design. Per Dillman, Smyth, and Christian (2014, p. 7):

- Any question about illicit activity or stigmatized behavior could be an issue. For example, a DMV survey with a question about motor carrier tax avoidance could introduce measurement error because respondents are not comfortable answering the question, even if it has no bearing on their own business.
- A question could be poorly or confusingly worded in such a way that respondents do not accurately answer the question, or designed in such a way that it does not accurately measure the intended concept.
- Some research indicates that the order in which questions are asked may influence the responses to those questions.
- Question layout can be an issue. “Check all that apply” questions tend to have fewer respondents, indicating the latter categories apply. Other aspects of visual layout can influence the likelihood of certain answers being selected.

- Respondent demographics and characteristics may approach questions differently and some groups may answer (or be asked) more accurately than others.
- Research has also consistently shown that scalar questions are answered differently in printed/ online surveys versus phone surveys due to the differences in the way people process visual and aural information.

Question Design and Order Effects

Recommendations pertaining to question order and wording are the result of research that examines the impact of survey configuration on cognitive processes. Malhotra (2008) examined the influence of response latency — the speed with which one responds to a survey question. The study revealed that customer evaluations of products and services are more susceptible to question and response order based on how much time the respondent spends thinking about each question. The study found that those who finished the survey most quickly were more susceptible to question and wording effects, especially those with lower levels of education. On the other hand, people who take surveys frequently become skilled at anticipating questions and possible answers for closed-ended questions and develop a series of mental shortcuts that potentially make them more susceptible to question-and-answer-order effects. Callegaro et al. (2009) develop conceptual descriptions of four cognitive processes: comprehension, retrieval, judgment, and answer selection. These researchers develop a dichotomous typology to explain how differences in these four steps manifest themselves: “satisficers and “optimizers.” Optimizers carefully follow the four steps that survey analysts would prefer, whereas satisficers skip steps to save time or cognitive effort. Surveys should be designed to make it more difficult to for respondents to make cognitive shortcuts.

One example of designing a question so that it is more likely to force individuals to think carefully about each potential answer is in Figure 29. In the first example, the respondents are asked to check the box corresponding to each online DMV service they have used. Research has shown those latter boxes are less likely to be checked, even if the response option order is randomized (Dillman, Smyth, and Christian, 2014). Survey design experts recommend the alternative question specification, which is to ask respondents individually about each service and require a “yes” or “no” response. The design requires the respondent to consider each possible service offered.

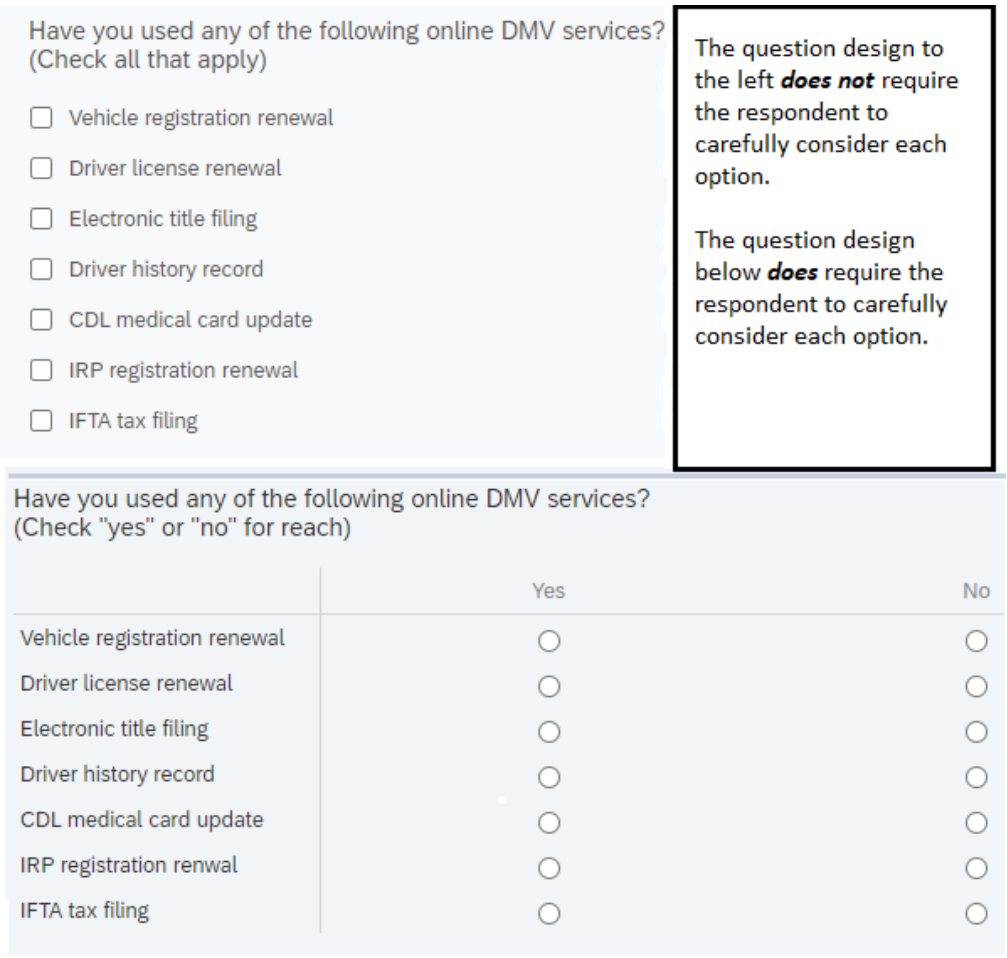

Figure 29. Example of How Question Design Can Impact Survey Results

Another issue is question order effects. Dillman, Smyth, and Christian (2014) point out two major question order effects — a contrast effect and an assimilation effect. Contrast effects occur when the question design and order causes answers to become more different over the course of the survey. Assimilation effects occur when the question design and order cause answers to become more similar over the course of the survey. A number of cognitive and normative effects play into these order effects. Early questions cause respondents to recall material that will be more present in their minds when answering subsequent questions. This is known as priming, which is typically associated with the affiliation effect because it causes respondents to process questions in a way that impacts consideration for later questions (Dillman, Smyth and Christian, 2014). One example of priming might be asking DMV customers whether a customer service representative was courteous before asking a question about overall satisfaction. Because of the priming question, the respondents are now apt to give more weight to the courtesy aspect of customer service than they might have otherwise. It could also be considered carryover, which is another assimilation effect mechanism where individuals assume two questions are related and answer both using similar criteria (Dillman, Christian, and Smyth, 2014).

These cognitive-based effects could also cause contrast effects. Two mechanisms in particular — anchoring and subtraction — are of particular interest. Anchoring occurs when the first question may influence the answers to a second question by tethering it an earlier standard. Subtraction is a contrast effect cognitive process whereby individuals discard considerations made in earlier questions when answering later questions (Dillman Christian and Smyth 2014). The Pew Research Center has conducted several experiments on contrast effects. Figure 30 provides a good example of the subtraction effect. Respondents were asked a series of questions about taking steps to reduce the budget deficit. The results show that respondents were more likely to support taking steps to reduce the deficit on the first question regardless of question order, but became less supportive on the second and third question (Tyson and Doherty, 2013).

The other effects are more normative or values-based than dependent on cognitive processes. Dillman, Christian, and Smyth (2014) identify the norms of evenhandedness and consistency as assimilation effects and appearing moderate as a contrasting effect. Respondents presumably want to be seen as evenhanded and consistent in responses, and so answers to questions have a tendency to become consistent. Whether it was a priming/carryover effect or a normative effect, Kentucky DVR study researchers noticed a very high level of correlation between how individuals answered questions about overall satisfaction, efficiency, employee knowledgeability, courtesy, and the ease of obtaining information (Martin et al., 2020). The assimilation effect made some sense in this context as all questions were interrelated, and therefore it would make sense for these elemental components to bear some relationship with overall satisfaction. There were fewer instances of a moderation contrasting effect in the Kentucky DVR study, which would have been something like someone having an unsatisfactory opinion about overall customer service but indicating a courteous customer service representative to avoid the appearance of being a difficult customer.

Question Order Effects in Deficit Polling

The three questions below were read to respondents in a randomized order ...

... Responses to the three questions differed depending on whether respondents heard a question 1st, or 2nd or 3rd

	Overall results	*Results among those who heard question ...* 1st	2nd or 3rd
What is more important ...	%	%	%
Taking steps to reduce the budget deficit	23	30	19
Keeping Social Security and Medicare benefits as they are	69	63	72
Taking steps to reduce the budget deficit	51	55	49
Keeping military spending at current levels	40	35	43
Taking steps to reduce the budget deficit	33	36	31
Keeping spending for poor and needy at current levels	59	57	60

Survey conducted Dec. 3-8, 2013.

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Figure 30. Example of Contrast Effect – Cognitive Subtraction (from Tyson and Doherty 2013)

Overall, there are some good rules to follow pertaining to question design and order effects based on Dillman, Christian, and Smyth (2014, p. 257) and other DMV-related investigations reviewed previously:

- Questions about similar topics should be grouped together.
- Begin with the most important questions, particularly those that will be important to the largest share of respondents. In the Kentucky DVR study, the lead question was about overall satisfaction. Leading with the main question of interests has several advantages. First, there will be survey attrition, and so a higher share of individuals will answer the first question than the last. Second, the first question is not prone to the order effects, particularly the assimilation and contrast effects, in the way later questions are.
- Questions that some respondents may find sensitive or objectionable should be at the end of the survey. Most DMV surveys ask little about attitudes or highly personal behavioral questions, but often survey analysts want to collect attribute data, which could include county of residence, customer type (e.g., individual, business, or agency representative), age, gender, and race. If people are uncomfortable providing this information and exit the survey, administrators can still analyze the respondent's partial survey results, as these should not be discarded.

- If a survey contains any filter or screening questions, they should all be asked sequentially before any follow-up questions.
- Avoid order effects if at all possible. Experiment with pilot tests, experimental evaluation, or other analytical method to determine whether the order sequence impacts survey results. If question order does impact results, one could randomize the question order starting with the second question to mitigate the impact.

Question Wording and Selection

Survey analysts may wish to pose any number of open-ended or closed-ended questions to the target population. Experienced survey designers understand the difficulty of selecting the appropriate framing, question type, answer categories, question design, and potentially structuring it so results are comparable to surveys administered for and/or by other organizations in the same industry. DMV administrators will want to distribute surveys with well-constructed questions that effectively solicit public opinion and potentially allow for comparison with benchmark institutions in other states.

There are several elements of appropriate question language that researchers must consider. All questions must be written in an objective, or neutral tone. A question must not be leading or pressure the respondent to select a particular response. Nor should double-barreled questions or ambiguous questions be asked (Dillman, Smyth and Christian, 2014; Johnson, Reynolds and Mycoff, 2008). Table 21 provides examples of questions that have the leading, double barrel or ambiguous question problems. The first example inappropriately frames the question in a positive light before asking the question, which is likely to positively bias responses. The improved version eliminates the leading sentence and includes both a positive and negative side in the question stem, which is also crucial to inadvertently avoid priming respondents to select only the positive choice (Dillman, Smyth, and Christian, 2014, p. 167). The second question asks about both employee knowledgeability and efficiency, which are two distinct concepts that should be evaluated separately. Last, any question that requires respondents to provide information should be clear and precise about what information is requested.

Table 22. Examples of Question Wording Issues

Wording Issue	Question Example	Improved Question Example
Leading	Our DMV's commitment to service is going to new levels with Saturday hours. How satisfied are you with our service?	How satisfied or dissatisfied are you with the current DMV office hours? (Mon-Fri 9a-5p, Sat. 9a-12p)
Double Barrel	How would you rate the knowledgeability and efficiency of the DMV customer service representative who assisted you today?	How satisfied or dissatisfied are you with the efficiency of the DMV customer service representative who assisted you today?
Ambiguous	Where do you live?	What is the ZIP code associated with your primary residence?

Some other aspects of how questions are worded are also important to keep in mind when designing a customer survey. Table 23 lists additional wording and answer formatting issues. The question stem should always include both the positive and negative answer options (if utilizing a Likert scale) in the question stem. The answer list should ideally include no more than four or five answer categories or provide an ordinal scale option, avoiding long lists (Dillman, Smyth, and Christian, 2014, p. 168). Answer categories should be mutually exclusive and the categories should be relatively balanced, or at a conceptual level equal distances apart. For example, demographic closed-ended question whose answers include age categories should strive for relatively equal increments of age or levels of satisfaction. All points on the scale should be labeled. Skipping labels can lead to confusion and incorrect responses. Randomization of response order may be necessary if there are order effects, although any Likert or bipolar scale responses should remain in sequential order even if reversed (Dillman, Smyth and Christian, p. 168).

Table 23. Additional Survey Wording and Formatting Issues

Wording/Formatting Issue	Bad Question/Answer Example	Improved Question/Answer
Include positive and negative answer option in question stem	Do you approve of the customer service you received during your recent DMV visit?	Do you approve or disapprove of the customer service you received during your recent DMV visit?
Scale has too many answer points	• Very satisfied • Somewhat satisfied • Slightly satisfied • Neither satisfied nor dissatisfied • Slightly dissatisfied • Somewhat dissatisfied • Very dissatisfied	• Very satisfied • Somewhat satisfied • Neither satisfied nor dissatisfied • Somewhat dissatisfied • Very dissatisfied
Scale is not conceptually equal	• Excellent • Very good • Good • Average • Poor	• Excellent • Good • Average • Poor • Terrible
All points not labeled	• 17 or younger • 18-34 • 35-49 • 50-64 • 65 or older	• 17 or younger • • 35-49 • • 65 or older

Another consideration survey developers must make regards question type. Generally speaking, survey questions are categorized as open-ended questions or closed-ended questions. Open-ended questions do not provide respondents with any answers to choose, whereas closed-ended questions require that they choose from a provided list of options. There are advantages and disadvantages to both question types. The advantage of open-ended questions is that they allow respondents to fully impart their knowledge and analysis of complex problems or issues, particularly in instances where researchers do not have preconceived ideas about what likely survey responses might be. The disadvantage of open-ended questions is that respondents often have too little or too much to offer, often in the form of a non-answer or a tangential reply that may not sufficiently engage with the question. Closed-ended questions are easier for respondents to answer and take less time. Respondents are more likely to answer questions about sensitive questions if there is a list of answers from which to choose rather than having to state an answer directly via an open-ended question. It is also much easier to administer closed-ended questions via phone surveys, whereas it is difficult and time-consuming to analyze open-ended questions in an aural survey format. Criticisms of closed-ended questions are that they force individuals to select one of an arbitrary range of choices, which means the answers could have less meaning (Johnson, Reynolds, and Mycoff, 2008, p. 324-325).

There are clear advantages to offering both closed-ended and open-ended questions on a survey. The ease and efficiency with which one can answer and analyze closed-ended questions make them by far the most prevalent. Data indicate that keeping surveys brief is essential. Respondent engagement drops off significantly if a survey takes more than 12 minutes to complete — and after just 9 minutes if the survey is taken on a mobile device (Qualtrics, 2020). SurveyAnyplace reports even starker numbers — response rates fall 15 percent if a survey has more than 12 questions or takes more than 5 minutes, and that decline reaches 40 percent if the survey is longer than 10 minutes (Lindemann, 2019). There are no hard rules about how many questions to include on a survey, but keeping questions to a minimum, particularly open-ended questions, is crucial. Qualtrics recommends limiting the number of text entry boxes on survey to three. In the Kentucky DVR study, the online surveys included two open-ended questions at the end of the survey. Both open-ended questions in all surveys had lower response rates than closed-ended questions. Nevertheless, including two or three open-ended questions can be a useful complement to well-targeted, closed-ended questions.

Last, many businesses and agencies who conduct customer satisfaction surveys would like to know how they compare to other organizations in their industry. The American Customer Satisfaction Index (ACSI) is a business that interviews or surveys 500,000 customers annually about frequently used services and products (ACSI, 2020). ACSI surveys a multitude of both public and private organizations to provide a standard metric by which individual organizations and industries can compare themselves at both the micro and macro level. The ACSI claims its measures of customer satisfaction are predictive of higher earnings and stock returns at the company level, and of consumer spending and GDP growth at the industry level (ACSI, 2020). Figure 31 displays the three questions used by the ACSI to create the index. The first question asks about the overall satisfaction with a particular product or service. Whether a product met or exceeded expectations is the focus of the second question. Last, respondents are asked about performance, or the extent to which a product or service met their ideal expectations. These scores are all tabulated on a 10-point scale. A formula converts the scores to a 100-point scale, which is used to compare an organization or industry to other organizations or industries.[5] The questions are weighted using a proprietary formula developed by ACSI. Weighting schemes are different for each industry. In most cases, overall satisfaction is accorded a higher weight than expectancy and expectancy a slightly higher weight than performance (Verint Systems, 2013).[6] ACSI reports also contain a battery of other survey questions evaluating multiple aspects of customer service.

The ACSI index has advantages. It is a widely used metric in government and several private industries, and has been around for many years so DMV administrators can examine both longitudinal and cross-sectional trends. The three questions are all simple closed-ended questions and can be easily integrated with most existing customer satisfaction surveys. DMV organizations can compare scores with other

[5] The simplest formula is (Satisfaction + Expectancy + Performance -3)/27X100, though the actual calculation varies.
[6] The Verint Systems article noted the state of Ohio sued the following formula to weight its ACSI scores: ((Satisfaction-1)*.3885 + (Expectancy-1)*.3190 + (Performance-1)*.2925) / 9 * 100

government agencies or private industry to assess performance. The question survey design raises a few questions. For one, there are some conceptual questions about mixing ratings for different kinds of organizations — some offer products, some offer services, and others offer both. In addition, on the available example survey questions not all points on the scale are labeled as suggested by other survey methodologists — a potential source of measurement error if that is how they appear on actual surveys. The similarity of the question could potentially cause an assimilation effect, although presumably those order effects could be mitigated with the right survey design. In certain survey formats — particularly phone surveys, where the number of questions is usually limited — avoiding the effect may be more difficult. Last, organizations must pay to be included in ACSI surveys, which may present a challenge given resource constraints.

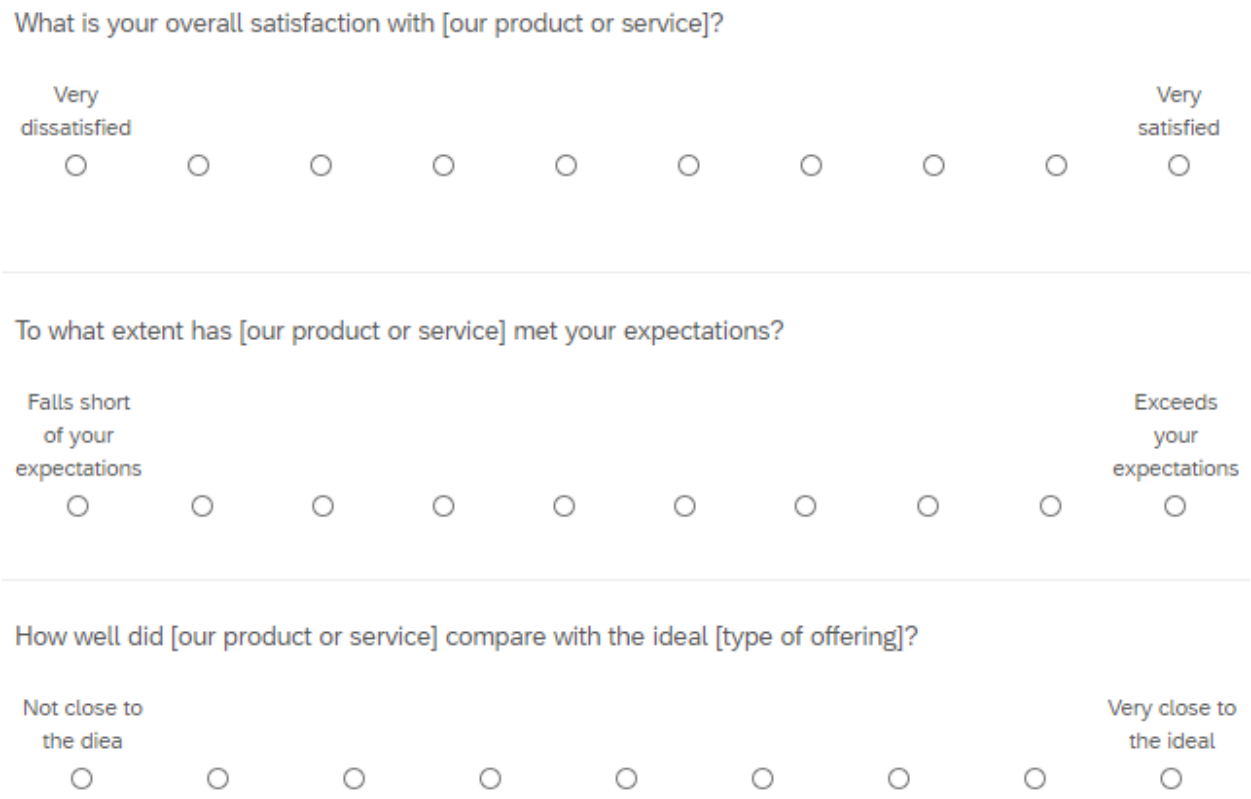

Figure 31. American Customer Satisfaction Index (ACSI) Survey Questions

Additional Survey Considerations

Idaho DMV administrators need to identify the survey modes they wish to use and develop a plan for the survey. To survey online customers, administrators should identify the best available sampling frame and use that to reach those customers. The Kentucky DVR study showed that sending a direct email to motor carrier customers had a 10-20x greater response rate than for an online link, which yielded a larger

sampler with a smaller sampling error. In addition, surveys distributed in this manner are less likely to suffer from nonresponse error because sampling everyone with a registered e-mail address cuts against the selection effect. Phone surveys are another effective way to reach customers. Customers can either be instructed to wait on the line or that they will be called back for an automated, pre-recorded survey. One advantage to these surveys is that it is easy to collate the customer issue to the survey for further analysis. Walk-in surveys are another potential option. In the Kentucky study, individuals were handed a postcard that included a QR code and website link or allowed to take a survey at a kiosk in some cases. This approach did not yield a statistically significant sample size, and is potentially subject to sampling bias because the DMV would have to rely on customer service representatives to hand them out.

Another alternative is to distribute a survey by mail. Mail surveys are a pretty old and time-tested survey method, even if sending surveys by mail seems like an antiquated approach today. One of the main reason mail surveys persevere is because many organizations — particularly government organizations with older database information systems — retain up-to-date address information about their customers but do not collect e-mail addresses or phone numbers. One reason the Kentucky DVR study surveyed individuals through a passive website link instead of directly contacting them was that no adequate sampling frame contained e-mail addresses or phone numbers. A mail survey was considered as a possibility to work around this limitation. However, the downside to mail surveys is cost. Even if an organization does not include paper questionnaires and just sends a postcard or letter, the cost is significant, particularly if agencies send out a follow-up or reminder e-mail as recommended by survey methodologists (Dillman, Smyth, and Christian, 2014). Mailing costs for postcards are 35 cents each and metered first-class mail letters are 50 cents. Assuming a low response rate of 1 percent, one would need to mail out about 40,000 survey postcards or letters with an online link in the letter, which would cost $14,000 to $20,000. Usually states can get slight discounts with bulk mailing rates, but the distribution cost would be far greater than via e-mail or phone.

Survey methodologists also note the importance of engaging the target survey population when sending out surveys. This approach calls for sending a clearly labeled and nicely formatted e-mail or letter explaining the importance of the project and why it is important to respond to the survey. Follow-up reminders should also be sent (Dillman, Smyth, and Christian, 2014; Lindemann 2019). They also suggest including incentives — gift cards, discounts, coupons or vouchers — to incentivize survey responses. Of course, it is more difficult for government agencies to offer those incentives for statutory, regulatory, and ethical reasons. Nevertheless, perhaps DMVs and other government agencies could create some kind of incentive structure within those boundaries to incentivize participation, even if it is as simple as a promise to send results to everyone who responds.

Some of the questions should be consistent across survey modes. This facilitates comparisons of customer satisfaction across groups. In its original survey of Kentucky DVR customers, researchers found that motor carrier customers using the state portal, walk-in customers, and those calling the phone center were more satisfied than individuals attempting to access services online. This kind of evaluation is only possible if at least some questions and answer banks are consistent, which means they can be combined and analyzed provided the survey is conducted during the same period.

Lastly, DMV officials should consider long-term strategic planning for future survey efforts. Currently ITD DMV is conducting monthly customer satisfaction surveys via its website, which is a good ongoing tool to deploy, even if it does have certain methodological limitations. However, long-term planning should include information technology service and application development that includes collection of e-mail addresses and distinguishes mobile phone numbers from landline numbers so that text notifications and surveys can be easily deployed to mobile users. Widespread collection of such data will make future multi-modal customer satisfaction surveys easier to administer.

Conclusions

Several state DMV or DMV-equivalent agencies have published survey reports which analyze customer satisfaction with their agencies. Four common threads run through these surveys. First, nearly all of the surveys focused on overall satisfaction and attributes of customer service provision. Second, some studies created multi-modal surveys or otherwise reached customers based on their method of accessing DMV services. Third, most surveys conclude that efficiency and quality of employees or employee training have some impact on customer satisfaction. Last, creating new and useful online tools can increase customer satisfaction over time.

Idaho DMV should implement a mixed-mode survey that lets the agency sample customers based on their point of contact, whether they access services via phone, through in-person office visits, or online. Sampling other relevant demographic groups (e.g., individuals, motor carriers, public agencies) may be useful as well. A well-designed survey will take a stratified sample of each key customer subgroup. As a general rule, each subgroup sample should yield between 400-600 responses to have a statistically significant sample with a reasonable amount of sampling error. Additional steps need to be taken to reduce coverage, nonresponse, and measurement error.

Question design, order effects, and question wording are important components of survey design, particularly if survey administrators want to avoid measurement error. The most important question should be asked first to insulate it from assimilation effects, contrast effects, or priming. Questions should be grouped together by topic, with more sensitive questions (e.g., requests for contact information, open-ended questions, and questions about illegal or morally controversial behavior) near the end of the survey. Surveys should consist primarily of closed-ended questions but can be supplemented by no more than 2-3 open-ended questions for visual survey forms. Aural (i.e. phone) surveys should stick to closed-ended questions. Overall, surveys should be brief, ideally consisting of no more than 12 questions and taking no more than approximately 5-10 minutes to complete. Questions should be worded clearly and include both positive and negative options for Likert and bipolar scales in the question stem. DMV officials may want to consider including questions from the ACSI so the agency can be compared to other private and public sector organizations.

There are a few additional considerations for DMV administrators. First, multi-modal surveys should include a phone option, walk-in option, and preferably a direct e-mail or mail option. The sample should be large enough to ensure that even with a modest response rate there will be a statistically significant stratified sample. DMV administrators should include a clear, concise explanation of the survey objectives

that describes why the study should matter to prospective respondents. Follow-up reminders are also essential. Incentives should be considered as long as they do not create measurement error or bias, although statutory, regulatory, and ethical restrictions may preclude their use. Surveys should be standardized across survey modes so that modal surveys can be combined and demographic groups compared. Long-term strategic planning for the DMV should include provisions for continuous or regular customer satisfaction polling. Information technology should be designed to gather additional customer contact information so that future surveys can be executed more efficiently and effectively. Application and electronic service development should be designed with survey sampling frames in mind so that it is easier to reach all customers via survey moving forward.

Chapter 9
Best Practices

Successful Implementation of Online Web Services

We recommend that ITD continue investing in and deepening its online service offerings. Online services help agencies improve customer service, increase efficiency, and reduce in-person transactions. As ITD broadens the number of services offered on its agency website, several precautions must be taken to ensure the successful deployment and implementation of new technologies.

An agency must conduct a thorough risk analysis before undertaking a new e-government project or an upgrade. Challenges that will be encountered when interfacing an existing system with a new system or feature should be anticipated. Analysis must also consider whether the agency will need to hire additional staff members to ensure sustainable implementation and maintenance.

E-government technologies can be quite expensive to develop, maintain, and upgrade. Agencies need to identify funding sources for implementation as well as long-term funding to ensure that the system can be adequately maintained and upgraded. Based on the surveys conducted for this study, states rely on state appropriations and user fees to fund online services. All of these factors depend on there being stakeholders within the agency and the state government as a whole that view online services as an essential priority. Having skilled project managers with previous experience in overseeing these types of projects within a state government can ensure these types of projects succeed.

E-signature

State DMVs have been slow to adopt e-signature technologies despite their ubiquity in other business environments such as medicine, insurance, and real estate. We recommend that ITD follow the guidelines of the UETA, ESIGN, and state laws to fully implement e-signature technology. E-signature increases convenience for customers and facilitates financial transactions between customers and car dealerships. In addition, e-signature provides a more robust means to trace a vehicle history from its manufacture to its end of life, which prevents title washing and protects consumers. Idaho should adopt the AAMVA guidelines for electronic odometer disclosures for vehicle titles and liens. Research shows that PKI offers the best security.

Trends in Online Web Services

Based on survey evidence, we recommend that Idaho continue identifying the online services which will be most beneficial to the agency and its customers. Our survey analysis shows several opportunities for web service enhancements based on the experiences of other jurisdictions. Several states are collecting and analyzing customer usage data for online services. Adopting this best practice will help Idaho measure

the number of customers using its web services and identify any cost savings that may accrue following implementation of future technologies.

Online Address Change

Many states let customers change their address online. They are most likely to offer this feature services for driver's license and motor vehicle services. Only a small number of jurisdictions make online address change available to motor carrier services. Most states do not require proof of address before changes can be submitted online.

E-government literature, as well as AAMVA, recommend that state agencies be proactive in identifying potential opportunities for fraud with online transactions, especially given the amount of personally identifying information amassed by motor vehicle agencies. Most states have adopted some form of security mechanism to prevent fraud for online address change. Those security precautions can take the form of two-step verification, address verification and confirmation, requiring personally identifiable information, and requiring customers to respond to security questions. Some jurisdictions control the type of address that can be changed online (i.e., mailing, physical, or principal) to prevent fraud. Several jurisdictions use USPS's CASS address verification standards combined with sending a letter to the old and new address to verify the address change. In other cases, jurisdictions use a combination of personal identifiers or security questions to verify a customer's identity.

Future Online Services for ITD Customer Web Portal

We recommend that ITD expand its portfolio of online services and consider the development of innovative services that are highly desired by the public. Idaho ranks 20th in the United States (tied with Iowa and Tennessee) for the number of online services provided. Both nationwide and in the western part of the country, the ITD is categorized in the middle range. ITD offers more online services than Nevada, Alaska, Oregon, Montana, and Wyoming among the 11 western states, but it still lacks a few services that are commonly found at agencies around the country. The list includes online road test scheduling, online request for duplicate vehicle registration issuance, online filing of sold notice, online scheduling of DMV appointments, and DMV service reminders via email or text message. Adding the services mentioned above will provide a more complete set of online services to the public, which may have a positive effect on a customer's perception of the usefulness of the ITD website and their overall satisfaction. Also, three innovative services that are not frequently provided, but worth discussing due to their desirability among the public as the use of smartphone and tablet PCs becomes prevalent are live chat, mobile applications for the DMV practice exam, and mobile applications for DMV services. Currently, seven states (Alabama, Delaware, Indiana, Iowa, Ohio, Pennsylvania, and Utah) offer a live chat function. A mobile application for the practice exam is currently available in Arkansas, Delaware, Indiana, Montana, Nebraska, Pennsylvania, South Carolina, Tennessee, and Wisconsin at no cost to the customer. Nine states (Connecticut, Florida, Georgia, Kansas, Montana, North Carolina, North Dakota, Tennessee, and Virginia) have developed mobile applications for general DMV services. The availability of these kinds of mobile applications is expected to become more common nationwide, and the ITD may see its customer base broaden when offering

innovative services that target the younger population. Georgia's Department of Driver Services launched one called DDS 2 GO in September 2018. Since the launch, transactions made using a mobile application jumped from 1,813 during the first month to 5,977 only a year later. After the launch of the mobile application, new account setups and logins through the website fell, as the frequency of using mobile applications for these activities increased. The usage pattern clearly shows that there is a group of potential customers that prefers transactions using a mobile application, justifying its development.

Trends in ITD Customer Satisfaction

The analysis of survey data accumulated from January 2011 to June 2019 by the ITD reveals changing customer perceptions of the ITD website and the online services it provides. On questions about whether they were able to acquire needed information, website appearance and usefulness, and overall customer satisfaction, respondents offered mostly positive evaluations across the entire survey period. However, the negative ratings and remarks have steadily increased. The positive ratings reflect the high quality of services ITD provides, but it is necessary to address the increasing rate of negative perceptions. This can be done by figuring out the types of information and services customers expected on the ITD website but are not available and establishing those services in the near future. The sense of usefulness and satisfaction is closely tied to whether customers could complete a transaction they wanted. Hence, the increased number of online services provided could have a positive impact. In terms of the website's appearance and it receiving a climbing number of negative ratings over the last eight years, we recommend ITD benchmark the newly launched websites, such as the Arkansas DMV website. The Arkansas DMV not only improved its available online services but also improved the appearance of the website to make it easier to navigate and find services.

Future DMV Customer Satisfaction Survey Design

We recommend that ITD DMV develop a mixed-mode customer satisfaction survey that allows administrators to gauge the attitudes and behaviors of customers who do not always (or ever) access online DMV services to better understand their needs and preferences. The survey should use available data to create sampling frames that allow for stratified sampling of various demographic groups, including those who access DMV services via phone calls, walk-in visits, or online. The survey should be designed to comport with best practices regarding question design, survey design, and question wording. Order effects of both questions and answer banks should be avoided. Questions should be grouped topically, with potentially challenging or sensitive questions placed toward the end of the survey. The most important questions should be frontloaded. Surveys should be brief in terms of the number of questions and average duration. Administrators should consider including ACSI questions to compare metrics with other public and private sector organizations. Surveys should come packaged with a clear, concise explanation of its purpose and benefits. They should have common questions across modes to enable comparisons of different customer types. Long-term strategic planning should include routine survey operations and development of better distribution mechanisms.

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Appendix A
List of Agencies Responsible for DMV Services by State

State	Services	Agency
Alabama	Driver License	Law Enforcement Agency > Department of Public Safety
Alabama	Vehicle Title/Registration	Department of Revenue > Motor Vehicle Division
Alabama	Motor Carrier	Department of Revenue > Motor Vehicle Division
Alaska	Driver License	Department of Administration > Division of Motor Vehicles
Alaska	Vehicle Title/Registration	Department of Administration > Division of Motor Vehicles
Alaska	Motor Carrier	Department of Administration > Division of Motor Vehicles
Arizona	Driver License	Department of Transportation > Motor Vehicle Division
Arizona	Vehicle Title/Registration	Department of Transportation > Motor Vehicle Division
Arizona	Motor Carrier	Department of Transportation > Motor Vehicle Division
Arkansas	Driver License	Department of Finance and Administration > Office of Motor Vehicles
Arkansas	Vehicle Title/Registration	Department of Finance and Administration > Office of Motor Vehicles
Arkansas	Motor Carrier	Department of Finance and Administration > Office of Motor Vehicles
California	Driver License	California State Transportation Agency > Department of Motor Vehicles
California	Vehicle Title/Registration	California State Transportation Agency > Department of Motor Vehicles

Appendix A List of Agencies Responsible for DMV Services by State

State	Services	Agency
California	Motor Carrier	California State Transportation Agency > Department of Motor Vehicles
Colorado	Driver License	Department of Revenue > Division of Motor Vehicles
Colorado	Vehicle Title/Registration	Department of Revenue > Division of Motor Vehicles
Colorado	Motor Carrier	Department of Revenue > Division of Motor Vehicles
Connecticut	Driver License	Department of Motor Vehicles
Connecticut	Vehicle Title/Registration	Department of Motor Vehicles
Connecticut	Motor Carrier	Department of Motor Vehicles
Delaware	Driver License	Department of Transportation > Division of Motor Vehicles
Delaware	Vehicle Title/Registration	Department of Transportation > Division of Motor Vehicles
Delaware	Motor Carrier	Department of Transportation > Division of Motor Vehicles
Florida	Driver License	Department of Highway Safety and Motor Vehicles
Florida	Vehicle Title/Registration	Department of Highway Safety and Motor Vehicles
Florida	Motor Carrier	Department of Highway Safety and Motor Vehicles
Georgia	Driver License	Department Of Driver Services
Georgia	Vehicle Title/Registration	Department of Revenue > Motor Vehicle Division
Georgia	Motor Carrier	Department of Revenue > Motor Vehicle Division
Idaho	Driver License	Transportation Department > Division of Motor Vehicles

State	Services	Agency
Idaho	Vehicle Title/Registration	Transportation Department > Division of Motor Vehicles
Idaho	Motor Carrier	Transportation Department > Division of Motor Vehicles
Illinois	Driver License	Office of the Secretary of State > Driver Services Department
Illinois	Vehicle Title/Registration	Office of the Secretary of State > Vehicle Services Department
Illinois	Motor Carrier	Office of the Secretary of State > Vehicle Services Department
Indiana	Driver License	Bureau of Motor Vehicles
Indiana	Vehicle Title/Registration	Bureau of Motor Vehicles
Indiana	Motor Carrier	Department of Revenue > Motor Carrier Services
Iowa	Driver License	Department of Transportation > Motor Vehicle Division
Iowa	Vehicle Title/Registration	Department of Transportation > Motor Vehicle Division
Iowa	Motor Carrier	Department of Transportation > Motor Vehicle Division
Kansas	Driver License	Department of Revenue > Division of Vehicles
Kansas	Vehicle Title/Registration	Department of Revenue > Division of Vehicles
Kansas	Motor Carrier	Department of Revenue > Division of Vehicles
Kentucky	Driver License	Kentucky Transportation Cabinet > Division of Driving License
Kentucky	Vehicle Title/Registration	Kentucky Transportation Cabinet > Division of Motor Vehicle Licensing
Kentucky	Motor Carrier	Kentucky Transportation Cabinet > Division of Motor Carriers

Appendix A List of Agencies Responsible for DMV Services by State

State	Services	Agency
Louisiana	Driver License	Department of Public Safety and Corrections > Office of Motor Vehicles
Louisiana	Vehicle Title/Registration	Department of Public Safety and Corrections > Office of Motor Vehicles
Louisiana	Motor Carrier	Department of Transportation and Development > Office of Multimodal Commerce
Maine	Driver License	Department of the Secretary of State > Bureau of Motor Vehicles
Maine	Vehicle Title/Registration	Department of the Secretary of State > Bureau of Motor Vehicles
Maine	Motor Carrier	Department of the Secretary of State > Bureau of Motor Vehicles
Maryland	Driver License	Department of Transportation > Motor Vehicle Administration
Maryland	Vehicle Title/Registration	Department of Transportation > Motor Vehicle Administration
Maryland	Motor Carrier	Department of Transportation > Motor Carrier Services
Massachusetts	Driver License	Department of Transportation > Registry of Motor Vehicles
Massachusetts	Vehicle Title/Registration	Department of Transportation > Registry of Motor Vehicles
Massachusetts	Motor Carrier	Department of Transportation > Registry of Motor Vehicles
Michigan	Driver License	Department of State
Michigan	Vehicle Title/Registration	Department of State
Michigan	Motor Carrier	Department of State Police/ Department of Treasury/ Department of State/ Department of Transportation

State	Services	Agency
Minnesota	Driver License	Department of Public Safety > Division of Driver and Vehicle Services
Minnesota	Vehicle Title/Registration	Department of Public Safety > Division of Driver and Vehicle Services
Minnesota	Motor Carrier	Department of Transportation > Commercial Vehicle Operations
Mississippi	Driver License	Department of Public Safety
Mississippi	Vehicle Title/Registration	Department of Revenue.> Motor Vehicle Licensing and Title Bureaus
Mississippi	Motor Carrier	Department of Revenue.> Motor Vehicle Licensing and Title Bureaus
Missouri	Driver License	Department of Revenue
Missouri	Vehicle Title/Registration	Department of Revenue
Missouri	Motor Carrier	Department of Transportation > Motor Carrier Services Division
Montana	Driver License	Montana Department of Justice > Motor Vehicle Division
Montana	Vehicle Title/Registration	Montana Department of Justice > Motor Vehicle Division
Montana	Motor Carrier	Department of Transportation
Nebraska	Driver License	Department of Motor Vehicles
Nebraska	Vehicle Title/Registration	Department of Motor Vehicles
Nebraska	Motor Carrier	Department of Motor Vehicles
Nevada	Driver License	Department of Motor Vehicles
Nevada	Vehicle Title/Registration	Department of Motor Vehicles

State	Services	Agency
Nevada	Motor Carrier	Department of Motor Vehicles
New Hampshire	Driver License	Department of Safety > Division of Motor Vehicles
New Hampshire	Vehicle Title/Reg.	Department of Safety > Division of Motor Vehicles
New Hampshire	Motor Carrier	Department of Safety > Division of Motor Vehicles
New Jersey	Driver License	Motor Vehicle Commission
New Jersey	Vehicle Title/Reg.	Motor Vehicle Commission
New Jersey	Motor Carrier	Motor Vehicle Commission
New Mexico	Driver License	New Mexico Taxation and Revenue Department > Motor Vehicle Division
New Mexico	Vehicle Title/Reg.	New Mexico Taxation and Revenue Department > Motor Vehicle Division
New Mexico	Motor Carrier	New Mexico Taxation and Revenue Department > Motor Vehicle Division
New York	Driver License	Department of Motor Vehicles
New York	Vehicle Title/Reg.	Department of Motor Vehicles
New York	Motor Carrier	Department of Motor Vehicles
North Carolina	Driver License	Department of Transportation > Division of Motor Vehicles
North Carolina	Vehicle Title/Reg.	Department of Transportation > Division of Motor Vehicles

State	Services	Agency
North Carolina	Motor Carrier	Department of Transportation > Division of Motor Vehicles
North Dakota	Driver License	Department of Transportation > Driver License Division
North Dakota	Vehicle Title/Reg.	Department of Transportation > Motor Vehicle Division
North Dakota	Motor Carrier	Department of Transportation > Motor Vehicle Division
Ohio	Driver License	Department of Public Safety > Bureau of Motor Vehicles
Ohio	Vehicle Title/Reg.	Department of Public Safety > Bureau of Motor Vehicles
Ohio	Motor Carrier	Department of Public Safety > Bureau of Motor Vehicles
Oklahoma	Driver License	Department of Public Safety
Oklahoma	Vehicle Title/Reg.	Oklahoma Tax Commission
Oklahoma	Motor Carrier	Oklahoma Corporation Commission >Transportation Division
Oregon	Driver License	Department of Transportation > Driver and Motor Vehicle Services
Oregon	Vehicle Title/Reg.	Department of Transportation > Driver and Motor Vehicle Services
Oregon	Motor Carrier	Department of Transportation > Motor Carrier Transportation Division
Pennsylvania	Driver License	Department of Transportation > Driver and Vehicle Services
Pennsylvania	Vehicle Title/Reg.	Department of Transportation > Driver and Vehicle Services
Pennsylvania	Motor Carrier	Public Utility Commission
Rhode Island	Driver License	Department of Revenue > Division of Motor Vehicles

State	Services	Agency
Rhode Island	Vehicle Title/Reg.	Department of Revenue > Division of Motor Vehicles
Rhode Island	Motor Carrier	Public Utilities Commission > Division of Public Utilities and Carriers
South Carolina	Driver License	Department of Motor Vehicles
South Carolina	Vehicle Title/Reg.	Department of Motor Vehicles
South Carolina	Motor Carrier	Department of Motor Vehicles
South Dakota	Driver License	Department of Public Safety > Driver Licensing
South Dakota	Vehicle Title/Reg.	Department of Revenue > Motor Vehicle Division
South Dakota	Motor Carrier	Department of Public Safety > Motor Carrier Division
Tennessee	Driver License	Department of Safety and Homeland Security
Tennessee	Vehicle Title/Reg.	Department of Revenue > Vehicle Services Division
Tennessee	Motor Carrier	Department of Revenue > Vehicle Services Division
Texas	Driver License	Department of Public Safety >Driver License Division
Texas	Vehicle Title/Reg.	Department of Motor Vehicles
Texas	Motor Carrier	Department of Motor Vehicles
Utah	Driver License	Department of Public Safety > Driver License Division
Utah	Vehicle Title/Reg.	Division of Motor Vehicles
Utah	Motor Carrier	Division of Motor Vehicles

State	Services	Agency
Vermont	Driver License	Agency of Transportation > Department of Motor Vehicles
Vermont	Vehicle Title/Reg.	Agency of Transportation > Department of Motor Vehicles
Vermont	Motor Carrier	Agency of Transportation > Department of Motor Vehicles
Virginia	Driver License	Department of Motor Vehicles
Virginia	Vehicle Title/Reg.	Department of Motor Vehicles
Virginia	Motor Carrier	Department of Motor Vehicles
Washington	Driver License	Department of Licensing
Washington	Vehicle Title/Reg.	Department of Licensing
Washington	Motor Carrier	Department of Transportation
West Virginia	Driver License	Division of Motor Vehicles
West Virginia	Vehicle Title/Reg.	Division of Motor Vehicles
West Virginia	Motor Carrier	Division of Motor Vehicles
Wisconsin	Driver License	Department of Transportation > Division of Motor Vehicles
Wisconsin	Vehicle Title/Reg.	Department of Transportation > Division of Motor Vehicles
Wisconsin	Motor Carrier	Department of Transportation > Division of Motor Vehicles
Wyoming	Driver License	Department of Transportation
Wyoming	Vehicle Title/Reg.	Department of Transportation

State	Services	Agency
Wyoming	Motor Carrier	Department of Transportation