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We provide services to the transportation community through research, technology transfer and education. We create and participate in partnerships to promote safe and effective transportation systems.
Research Report
KTC-12-06/SPR 413-10-1F

**Kentucky Department of Vehicle Regulation**
**Internet Applications Study**

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in cooperation with
Kentucky Transportation Cabinet
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16. **Abstract**

   The study identified 107 unique interactive services, and 13 unique information services on state vehicle regulation agency web sites. The average state has roughly 15 percent of all existing services. States with larger populations, number of registered vehicles and drivers tend to have more total services and transaction services. The general flow of the data indicates a fast level of growth, as companies and individuals embrace the efficiency and flexibility of online transactions. The W3C Unicorn Validator, Link Sleuth, Web Accessibility Checker and Hubspot Marketing Grader scores were combined to generate a web design score for each state. Washington received the highest score, followed by North Dakota and North Carolina. Kentucky received the lowest score, along with South Carolina and Ohio. The KYTC’s Office of Information Technology is developing several new applications for the DVR and its constituent divisions. The implementation plan also recommends the OIT review the reports from the W3C Unicorn Unified Validator, Xenu Link Sleuth, and Web Accessibility Checker to examine errors, warnings, broken links and known problems with Section 508 compliance. In accordance with the Hubspot Marketing Grader report, it is recommended the state create a comprehensive marketing plan for the Department of Vehicle Regulation, perhaps as a component of a comprehensive KYTC marketing plan.

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Executive Summary

As the Internet becomes further ingrained in American life, state governments are assessing ways in which to expand access to information and online services. This concept, known as E-Government, started as a series of experiments (mostly at the national level) but is now rapidly transforming into an essential tool for governments at all levels. Officials in the Kentucky Department of Vehicle Regulation commissioned a study of its Internet applications to assess current capabilities, and generate recommendations for improvement and best practices based on an assessment of motor vehicle regulatory agencies in other states. The study examines the web applications developed in all other state departments of vehicle regulation (or the functional equivalent), web usage, web design and best practices for Kentucky going forward.

The study identified 107 unique interactive services, and 13 unique information services on state vehicle regulation agency web sites. Driver’s licensing services, which include driver’s license renewal, DMV practice tests, organ donor registration and handicap placard application/renewal, constitute 25 services, or nearly a quarter of all transaction services. There are currently 18 documented services for motor carriers, which include IFTA filing, IRP registration, fleet reports and UCR registration. Motor carriers have the fewest number of services of the divisions represented. Motor vehicle licensing, on the other hand, has the most services of any division, with 32 transaction services offered. The most common transaction services offered in states are Account/Password/PIN management, vehicle registration renewal, driving history records and IRP filing. The most common information services offered are downloadable publications and forms, specialty plate browsing, state traffic information and personalized plate searches. The mean number of services per state was 16.9, with an average of 4.6 information services and 12.3 transaction services per state. Therefore, the average state has roughly 15 percent of all existing services. Kentucky has 15 total services, comprised of four information services and 11 transaction services.

New York tops the list, offering 39 online services. Also rounding out the top tier of states are Arizona (32), Virginia (32) and Florida (30). New York has the most transaction services (32), followed by Virginia (27), Arizona (23) and Florida (23). Correlations were calculated between each state’s number of total services and transaction services and population, number of licensed drivers, number of registered vehicles, per capita income, IRP fleets and transportation expenditures. States with larger populations, number of registered vehicles and drivers tend to have more total services and transaction services. Although the findings are not causal, they suggest larger states may have a greater incentive to develop web applications because of the financial strain of handling vehicle and driver’s credentialing and licensing via field offices, phone calls and mail. IRP fleets, which can be thought of as a proxy measure for the size of the trucking industry in a particular state, is positively related to the number of web applications as well, although the strength of the relationship is not as strong. Surprisingly, the percentage of state budget dollars spent on transportation functions from 2009 to 2011 is negatively related to the number of web applications a state has. The reasons for this pattern are unclear. Per capita income has virtually no relationship with a state’s number of web applications.

A survey was developed and disseminated to every state’s vehicle regulation agency or agencies in an effort to collect information about the number of website visitors, annual online
transactions, revenues generated from online transactions, percentage of department business conducted online, which credit cards are accepted, and whether other forms of payment are accepted. Respondents were also asked to estimate how much money the agency saved by implementing online services, and whether they had partnerships with any information technology consultants. Survey results generally indicate a steady increase in website traffic, online transactions, and business share, although the economic recession (which began in 2007) has caused these trends to slow or plateau. An attempt to find proxy measures for website usage was made since few states provided detailed website usage information. Two such measures were developed, using Google AdWords and Quantcast analytic services. The Google AdWords measure turned out to be highly correlated with population, vehicle registration and licensed drivers. States with more residents would be expected to have more website traffic, providing a rather intuitive finding. Quantcast estimates had the strongest relationships to population, vehicle registration and licensed driver, though the magnitude of the relationship was not as strong. Revenue figures from the state of Texas show a steady increase in the amount of revenue generated from online sales for vehicle registrations and IRP registration, although commercial vehicle revenue increased from 2005 to 2007 before declining from 2008 to 2010. However, the general flow of the data indicates a fast level of growth, as companies and individuals embrace the efficiency and flexibility of online transactions.

No comprehensive studies of cost savings have been conducted, but several states reported anecdotal evidence of significant cost savings realized through adoption of E-Government services for vehicle regulation. Several states have some form of partnership for online government services. NIC Inc. is a company with partnerships in 23 states, including Kentucky. However, many states do some, if not all web design and development in-house. As a result, there are a variety of approaches to vehicle regulation websites. For example, states have vastly different policies regarding credit and debit card service charges, even though most of them accept the same credit cards.

In order to provide a systematic web design evaluation of all states, some quantitative metrics were taken using the W3C’s Unicorn Validator tool to assess the quality of the HTML code, CSS code and mobile compatibility. Xenu Link Sleuth software assessed the maintenance of web site HTML codes, and the Web Accessibility Checker to assess Section 508 accessibility requirements. Hubspot’s Marketing Grader was used to grade each site’s marketing strength. The W3C Unicorn Validator assessed the number of HTML errors, HTML warnings, CSS errors, CSS warnings, mobile errors and mobile warnings for each state’s website or websites. The Xenu Link Sleuth Software analyzed the number of links on each site and the percentage of them which sent users to active pages. The Web Accessibility Checker has provided analysis of a website’s compliance with Section 508 of the Rehabilitation Act of 1973, which defines accessibility standards for government information technology. The Hubspot Marketing Grader provides information about the marketability of any user-specified website. There are three metrics evaluated by the automated grading process: Top of the Funnel, Middle of the Funnel and Analytics. The first category deals with creating, optimizing and promoting content. The “Middle of the Funnel” category looks at whether states have forms to collect information on visitors, marketing software, the length of time visitors are staying on the site, blog links, subscription offers, social media account links, Twitter mentions, and tweet links to “landing pages” (pages with forms for collecting information). Last is analytics, which determines
whether a website administrator has registered the site with an analytics service and the estimated number of unique visitors.

The W3C Unicorn Validator, Link Sleuth, Web Accessibility Checker and Hubspot Marketing Grader scores were combined to generate a web design score for each state. For each state that has vehicle regulation functions spread across multiple websites, the number was averaged across those sites and used for each measure. Washington received the highest score, followed by North Dakota and North Carolina. Kentucky received the lowest score, along with South Carolina and Ohio. There is a slightly negative correlation between web design scores and the number of total web services a state has, but the association is very slight. Was the relationship stronger, it could signify states with more web application have more complex websites, which in turn could lead to greater errors. However, such a hypothesis is not strongly supported by the data. Kentucky’s Department of Vehicle Regulation should place greater emphasis on W3C standards compliance, Section 508 compliance and marketing approach.

The KYTC’s Office of Information Technology is developing several new applications for the Department of Vehicle Regulations and its constituent divisions. The applications in development are listed in Table 19. Those which are not in development, but are recommended options as a result of this study, are * in the table. The “DIV” column denotes the relevant division. The third column lists C-G for “citizen-to-government” applications and G-G for “government-to-government” applications. Applications used to facilitate the electronic exchange of information, money and services between the public and government agencies are known as “citizen-to-government” applications (C-G), and applications used to facilitate the same types of exchanges between two government entities are known as “government-to-government applications.” The “Status” column denotes the planned completion date, where relevant, and the “Notes” column provides relevant information about each application. These applications and recommendations are described in detail in Chapter 5.

Since the original 49-state study of state vehicle regulation web applications, the OIT has implemented, or plans to implement KYU (Efile/Epay), IRP Web, KIT (Efile/Epay), Temporary Permits, OS/OW, EWD, Account Mgmt System, Super CVIEW, Motor Carrier Portal, DL Practice Test, No Pass No Drive, several KAVIS-related applications and miscellaneous licensing and credentialing services. Some of the applications are not citizen-to-government applications, which were the exclusive focus of the applications studied in Chapter 2. Several additions, expansions or enhancements of web applications are recommended. New and expanded applications include DL/Personal ID Renewal, Specialty/Personal Plates, Service Reminder, Live Help and Smartphone Applications. Enhancements to the temporary trucking permits and account management system were also recommended.
The implementation plan also recommends the OIT review the reports from the W3C Unicorn Unified Validator, Xenu Link Sleuth, and Web Accessibility Checker, to examine errors, warnings, broken links and known problems with Section 508 compliance. In accordance with the Hubspot Marketing Grader report, it is recommended the state create a comprehensive marketing plan for the Department of Vehicle Regulation, perhaps as a component of a comprehensive KYTC marketing plan. The recommendations from the Hubspot analysis indicate a greater need to make use of blogs, social media and the agency’s ability to collect data from residents in order to facilitate better communication with Kentucky residents.

The Digital States Survey, which is conducted biannually by the Center for Digital Government, provides grades for all state government digital services. The scope of such a study extends beyond a single department, cabinet or division and looks at the overall state performance. Grades were given based on streamlined operations and quantifiable results in better serving residents. Based on feedback received from the states, grades are assigned and awards given to those states which demonstrate results in eight areas, including citizen engagement and open government, administration and human resource management, and adaptive leadership and innovation. For the 2010 edition of the survey, Kentucky received a B+ on its state report card, which according to the study, means the state is “[t]rending up. Demonstrated results in many categories. Leadership using modernization to change entrenched practices to prepare for more sustainable operations. Incentives for collaboration in place. Measures used in key areas.”¹ These characteristics seem to be appropriate for continued progress for every agency desiring to expand its e-government initiatives.

Introduction

As the Internet becomes further ingrained in American life, state governments are assessing ways in which to expand access to information and online services. This concept, known as E-Government, started as a series of experiments (mostly at the national level) but is now rapidly transforming into an essential tool for governments at all levels. Officials in the Kentucky Department of Vehicle Regulation commissioned a study of its Internet applications to assess current capabilities, and generate recommendations for improvement and best practices based on an assessment of motor vehicle regulatory agencies in other states.

According to a 2010 survey by the Pew Research Center, 82 percent of all Internet users (or 61 percent of all American adults) had completed a transaction or looked for information on a government website within the last year. E-Government has become increasingly popular with citizens using government services, and the number of people using the Internet and E-Government services is projected to increase in coming years. The study shows web users prefer online contact to phone call, in-person visits and writing a letter. Such preferences will only be augmented over time, as younger citizens use the web at higher levels than older citizens.

There are several advantages to the E-Government model, for both government and citizens (or residents). Governments see a gain in efficiency, as E-Government services generally allow cuts to services in offices or by mail, thereby saving valuable budget dollars. Private sector contractors such as NIC have pointed to several instances where projects developed for state government have increased revenues or provided cost savings. Specific examples included a project where Virginia generated an additional $7 million in revenue due to enhanced marketing of electronic driver records. A self-funded E-Government in West Virginia provided $10 million in savings during the first two years due to the elimination of non-vital infrastructure, technology and application development costs. By creating greater access to government information and services, E-Government also increases transparency and allows for more equitable access to information. Several organizations now rate states based on a variety of transparency, usability, citizen engagement and best practices. The majority of respondents in the 2010 Pew study felt it was “very important” for government agencies to provide general information, allow for online government contact and online transactions though official web sites. While these attitudes are more prevalent in people with higher levels of income and education, they are remarkably

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5 Such ratings are compiled by The Center for Public Integrity, the Center for Digital Government and Sunlight Foundation.
constant across racial and ethnic groups.\textsuperscript{6} Last, studies have shown a transition from traditional, paper-based commerce to E-commerce technologies available for delivery via broadband internet services will reduce greenhouse gas emissions due to lower levels of energy consumption. In effect, businesses would use far less fuel to travel because of teleconferencing, and paper and plastic consumption would be lowered because there is less physical information transmitted via paper mailing or CDs encased in plastic.\textsuperscript{7} These benefits are equally applicable to E-Government services, which can utilize the same technology. The state of Oklahoma has initiated a Go Green Oklahoma initiative to track environmental impacts of E-Government initiatives. According to official estimates, the state has reduced paper consumption in state agencies by 44.4 million sheets since 2007, saving approximately 5,328 trees.\textsuperscript{8} The initiative also points out that each minute spent driving to a government agency for in-office serve requires more than 20 times the energy of a minute spent transacting on the Internet.

E-Government services with the most widespread applicability are often those provided at the state level. Figure 1 displays the percentage of respondents to the Pew survey who have accessed

\textbf{Table 1. Pew Respondents and Use of E-Government Services}

<table>
<thead>
<tr>
<th>Percentage of web users reporting they had…</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Looked for info, completed transaction on gov’t website</td>
<td>82</td>
</tr>
<tr>
<td>Looked for info about public policy, issue</td>
<td>48</td>
</tr>
<tr>
<td>Looked up online services a gov’t agency provides</td>
<td>46</td>
</tr>
<tr>
<td>Downloaded gov’t forms</td>
<td>41</td>
</tr>
<tr>
<td>Renewed a driver’s license or auto registration</td>
<td>33</td>
</tr>
<tr>
<td>Gotten recreational or tourist information from a government agency</td>
<td>30</td>
</tr>
<tr>
<td>Paid a fine</td>
<td>15</td>
</tr>
<tr>
<td>Have applied for a recreational license (e.g. hunting or fishing)</td>
<td>11</td>
</tr>
</tbody>
</table>

\textit{Note: Web users comprise an estimated 61% of the adult population.}

or performed online activities during the last year. Several of the questions were about vague activities, such as looking up a public policy issue or downloading government forms, which could apply to E-Government at any level. However, questions about renewing a driver’s license or auto registration, getting tourist information, and applying for a hunting or fishing license unquestionably have state-level application. State departments of vehicle regulation have begun offering such options in growing numbers. Vehicle regulation agencies in every state offer downloadable forms for traditional transactions. As of March 2011, 42 states offered online

\textsuperscript{6} Ibid.
vehicle registration renewal and 20 offered online driver’s license or personal ID renewal. Eleven states have online systems to process payment of traffic, parking or toll citations. Other forms of tax payment, licensing and credentialing, as well as other vital government services, are also being transitioned to online formats. As more and more services are transitioned from traditional to online formats, the quality of web applications will become an increasingly vital tool for providing citizens with access to government services.

The purpose of this study was to catalogue services currently provided by other vehicle regulation agencies in all U.S. states, investigate usage statistics in each of these states via survey, evaluate web design practices and describe the best practices for state vehicle regulation agencies. Chapter 1 reviews the methodology employed for each component of the study. Chapter 2 reviews the web applications available, compares the popularity of various applications and the number of applications developed by each state. Chapter 3 presents survey results and usage statistics, and attempts to find factors that might explain why some states have more website functionality and higher usage rates. Chapter 4 evaluates web design for vehicle regulation web sites in U.S. states. Chapter 5 provides an implementation plan for the Kentucky Department of Vehicle Regulation and provides recommendations for an improved website.
Chapter 1. Methodology

The following chapter details the methodology employed in this study. The study took place during 2011 and early 2012. Given the rapidly changing landscape of online services offered by state vehicle regulation agencies, these services may not be precisely current. However, the analysis provides a fairly recent and therefore reasonably accurate snapshot of current trends. The study looks at vehicle regulation web sites in 49 states, including the continental United States and Alaska. Hawaii was not included because vehicle regulation functions are handled at the county level. There is no state-level vehicle regulation agency that handles vehicle registration, driver’s licensing or truck registration. Study criteria were based on Kentucky’s Department of Vehicle Regulation and the administrative and regulatory responsibilities related to such an agency. In particular, the online information and services performed by the Division of Motor Carriers, Division of Driver Licensing and Division of Vehicle Licensing are of interest. The equivalent regulatory agency responsible for driver licensing, vehicle licensing and motor carriers was identified for each state, as well as the parent agency (if applicable). Web portals for each agency responsible for equivalent tasks in each state were also found via Internet searches. Each applicable state agency’s web site was catalogued and put on a list. Some states have one web site covering driver licensing, vehicle licensing and motor carrier functions (such as Kentucky), whereas other states have two or three agencies (or portals) dealing with those functions (such as Pennsylvania). Once these sites were discovered, a standardized e-mail was sent to all agencies in the spreadsheet requesting information about the number of website visitors, annual online transactions, revenues generated from online transactions, percentage of department business conducted online, which credit cards are accepted, and whether other forms of payment are accepted. Respondents were also asked to estimate how much money the agency saved by implementing online services, and whether they had partnerships with any information technology consultants. Follow-up e-mails, second attempts and third attempts were made in order to get as much feedback as possible. The following states provided at least partial survey feedback:

- Alaska
- Arizona
- Colorado
- Florida
- Idaho
- Indiana
- Kentucky
- Louisiana
- Minnesota
- Missouri
- Nevada
- New Hampshire
- New York
- North Carolina
- North Dakota

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9 The survey is located in Appendix A.
After gathering the survey data, the next step was to catalogue all available services provided by each of the states. In doing so, it was necessary to define what constituted a service. Scholars studying E-Government development have devised various concepts to compare and index government websites in the international context. Many of these studies examined the quality of Internet services provided by governments in the developing world, but the criteria are no less useful for comparing state government websites within the United States. The four classification comparisons have different terminology but the concepts have similar substantive meaning. All of these researchers agree websites in this phase of development tend to have static or cursory information, such as relevant locations, phone numbers and e-mail addresses. There are some unclear particulars and disagreement about whether certain functions should constitute a static or dynamic information process. For example, these classifications do not clearly indicate whether

Table 2. E-Government Development Frameworks¹⁰

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Cataloging</td>
<td>Emerging</td>
<td>Emerging</td>
<td>Publishing (web presence)</td>
</tr>
<tr>
<td></td>
<td>Emerging</td>
<td>Emerging</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enhanced</td>
<td>Enhanced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interactive</td>
<td>Transactional</td>
<td>Interacting</td>
</tr>
<tr>
<td></td>
<td>Transactional</td>
<td></td>
<td>Transacting</td>
</tr>
<tr>
<td></td>
<td>Seamless/networked</td>
<td>Connected</td>
<td>Transforming (integration)</td>
</tr>
<tr>
<td></td>
<td>Horizontal integration</td>
<td></td>
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e-mail would fall under the first or second phase of development. Downloadable forms are a point of contention as well. Some scholars consider downloadable forms to be catalogued, static information, and others consider it an interactive feature (Layne and Lee\textsuperscript{11}, 2001; United Nations 2008\textsuperscript{12}). For purposes of this study, downloadable forms are considered an information service, as are any statistical reports or official publications. All catalogued functions were considered information services or transaction services. Information services were defined one-way, or static, transmission of information from the government agency and the relevant website user. Transaction services were defined as two-way, or dynamic, transmission of information between both the government agency and the relevant website user. Integration is the most advanced step, where large governmental departments or even entire state governments are connected through E-Government. This would suggest a centralized website portal where citizens could transact services with all agencies within a cabinet, such as KYTC, or even all of the state government. In the KYTC example, such a site would store basic user information and apply it to all applications, ranging from car registration, pilot license application, fleet registration for IFTA or IRP, and driver’s license renewal.

In order to facilitate the cataloguing exercise, a spreadsheet was created with each state, and various services were added as each state’s functions were recorded. New entries were created when a state offered a service distinct from any service documented in all previous states. Binary indicators were recorded for all services in every state; a “1” indicated the state had the service, and “0” indicated the state did not have the service. Definitions were recorded for each service, and substantively interesting features or components particular to a certain state’s service were noted.

States were compared according to the number of features offered by corresponding vehicle regulation websites. Previous cross-sectional studies of Internet development in the developing world propose different competing manners of measuring such development. West (2007a) developed a simple E-Government index:

\[
e_i = 4f_i + x_i
\]

where,

- \( e_i \): The index of the total index score for each website.
- \( f_i \): The number of features present on website \( i \).
- \( x_i \): The number of online executable services on website \( i \).

\( e_i \) is the index of the total index score for each website. \( f_i \) represents the number of features on a website, which consists of the number of publications, databases, audio clips, video clips, foreign language access, not having ads, not having premium fees, not having user fees, disability access, having privacy policies, security policies, allowing digital signatures on transactions, an option to pay via credit cards, email contact information, areas to post comments, option for


email updates, option for website personalization, and personal digital assistant. Online services are those which allow users to complete or execute a transaction without visiting a service center. West gives features a heavier weight than online transaction services, which is somewhat discordant with several theories of web development if transactions are more important than static, catalogued content. Rorissa, Demissie and Pardo (2011) offer more complex indices, but for this study, the index is simply a modified version of West’s original index. Features are not counted in such a detailed manner. Instead, downloadable forms are merely a single category, and other forms of information and statistics comprise an information statistic. For each state, this is the sum of all of these services offered. Pictures, videos, graphics and other embedded objects are not counted. Transaction services are measured the same way as West measured them, with one slight modification. The standard for an online service to count as a transaction service for purposes of this study meant a user completed a transaction and no further follow-up task (not just a physical trip to a service center, but mailing, phone calls, follow-up e-mail communication, etc.) was necessary. So a measure of information services and transaction services was created for each state, and the index of the two was the total web services index. The index used in the study therefore looks like this:

\[ e_i = f_i + x_i \]

where,

- \( e_i \) = the total number of information and transaction services on website \( i \)
- \( f_i \) = the number of information features present on website \( i \)
- \( x_i \) = the number of online transaction services on website \( i \)

Usage statistics were spotty. Very few states reported comprehensive usage statistics, and some state vehicle regulation agencies do not even track the number of users who use their web sites. In order to compare all states, proxy measures had to be identified and assembled. The first estimation technique was generated using the Google AdWords Keyword Tool, which allows users to specify a Google search phrase. The application then pulls up a database of that particular search phrase, as well as related search phrases. For each state, a search was conducted for “[state name][dmv]” and “[state postal code][dmv]”. DMV was used as the search term for all states because Google AdWords then creates a spreadsheet with the estimated number of global monthly searches and local monthly searches for the specific search term and all related search terms indexed by Google. The box “show only closely related ideas” was checked in order to limit responses to related queries. The results were compiled by state and multiplied by 12 to get annual search estimates for each state vehicle regulation website. The second estimation method made use of statistical data from Quantcast, which produces web analytics tools to assist web publishers with finding and attracting their target audience. Quantcast provides audience and demographic data for more than 100 million websites, video, widgets, blogs and advertising campaigns. In cases where a web publisher is a participating member, quantified data is provided. However, Quantcast provides non-quantified estimates for any url entered on its website. The engine then identifies the portal website, and generates the estimates of the number of people visiting the website each month. Fully quantified profiles present statistics for peoples, visits and pageviews, whereas the non-quantified just provides an estimate of the number of individuals who visited the website during a particular month, which can be specified by the user. Both the Google Adwords and Quantcast measures are then converted to ratios based on the number of people or vehicles registered in a particular state. These ratios are
then correlated to see whether the two measures are essentially measuring the same concept. This is important given both estimates are proxies and not hard numbers. The indexes are then re-scaled from 0 to 1 and ranked in order to make them more easily interpretable.

The next chapter of the analysis deals with web design. Web design is an amorphous concept that can encompass internet technology systems, web standards compliance, website maintenance, long-term E-Government planning, user interface, application functionality, graphic design, and web aesthetics, among other things. Systematically measuring all of these concepts was beyond the scope of this study. As a result, a tiered approach was taken. Systematic measurements of web standards compliance and website maintenance were taken, while other components of web design were addressed in a more limited capacity. In other cases, a limited narrative or qualitative evaluation was made.

To systematically test The World Wide Web Consortium (W3C) is an international community comprised of 357 prominent technology firms such as IBM, Microsoft, Apple, Google, and Facebook. The consortium has a full-time staff and also works with the public to develop technical specifications and standards for an Open Web Platform, which attempts to maximize industry consensus regarding issues of web design. These issues include web design and application, web architecture, semantic web, XML technology, web services, and web devices, as well as browsing and authoring tools. Specifically, this study utilized W3C’s Unicorn validator, which checks a user-specified website for compliance with existing HTML, CSS and mobile web standards. Each state motor vehicle agency website was analyzed with the Unicorn validator, which reports coding or compatibility errors as well as warnings about potential problems with a site’s code. In addition to Unicorn validator, the Web Accessibility Checker assesses a site’s Section 508 compliance. Section 508 of the U.S. Code sets forth accessibility standards for the public, including those with disabilities. A score for each state was recorded. Last, a test of web maintenance was developed by analyzing a web site called Xenu Link Sleuth. This open source software, developed by Tilman Hausherr, catalogues every link specified on a website, whether those links are internal or external, and tests to see whether the link is working or inoperative. For each state web site, the total number of links is specified, along with the percentage of those which are working.

After all of these data were collected, a web design index was created. The measures in the index included W3C Unicorn HTML, CSS and mobile web errors found on each state site; Section 508 compliance scores from the Web Accessibility Checker; and the percentage of working links on each state agency site from Xenu Link Sleuth. For states with more than one website, an average score was taken for each. Each measure was scaled between 0 and 1 so each indicator could be given equal weight. The index score for each state, therefore, was the mean of each measure.

The last chapter was written in collaboration with the KYTC’s Office of Information Technology. The chapter lays out development plans, provides recommendations for other web applications and suggests enhancements to others in the development pipeline. Procedures for evaluating and improving web design are discussed, as are the results of the 2010 Digital States Survey.

Unicorn validator can be accessed at: http://validator.w3.org/unicorn/
Web Accessibility checker can be accessed at: http://achecker.ca/checker/index.php
Chapter 2. Web Applications and Information Services

Web applications are applications that can be accessed and run through a web browser. These applications have some sort of interactive function, which allow users to complete a particular task or suite of tasks. In this case, the web browser is a client and the information generated from the application is stored on a server. For purposes of this analysis, a web application is conceptually equivalent to a transaction service. Information services are not applications, even though they can be accessed via a web browser and the information is stored on a server. The distinction is web applications or transaction services update the information stored on the server or database, and are dynamic in this sense. On the other hand, static information that can be printed, viewed or downloaded does not constitute an application. Such information does constitute an information service, because the state is providing its residents with important or useful information about a public entity.

Procedurally, each state’s vehicle regulation website for vehicle licensing, driver licensing and motor carriers was catalogued. Next, a spreadsheet was created which documented whether a state had a particular service. Throughout the process, categories were added, and in a few cases, altered to most accurately reflect the transaction or information service provided. Only services on the predetermined sites were calculated. It is possible some states would provide these services on other websites, but did not have them counted because of the difficulty involved with systematically documenting services difficult to locate or access. One example is state 511 websites, which provide traffic updates. In many cases, these web sites were integrated with state vehicle regulation websites, or are directly accessible from the portal page. In both instances, a state received credit for hosting such a service. However, if a state’s 511 service had to be located via a separate web engine service, the state did not receive credit. The rationale here is a state’s service should be easy to locate, and if it is difficult for a researcher to find, it is that much more difficult for a casual Internet user to find. Documentation describing each catalogued service was also prepared, with specific examples about interesting approaches in individual states noted with a binary indicator – “0” if a state does not have a particular service, and “1” if it does have a particular service.

2.1 Interactive Services

The study identified 107 unique interactive services, and 13 unique information services on state vehicle regulation agency web sites. Each service was classified according to the applicable vehicle regulation division in accordance with the organizational structure of the Kentucky Department of Vehicle Regulation. Two points should be made: First, it should be noted in some cases than an exhaustive list of services available in all states was not available, particularly for motor carriers or trucking services, because a few states do not reveal which services are offered behind their secured portal. Second, these services are rapidly proliferating and evolving, and so the results reflect a mere snapshot in time of a dynamic process.

The service categories are all divisions, driver licensing, motor vehicle licensing, and other. Table 3 displays the frequency distribution of transaction services by division. Some applications have applicability across divisions. These types of transactions constitute the horizontal
integration web development theorists have envisioned. As of Spring 2011, there were nine such services on vehicle regulation websites. Most of these services involved account registration, refunds and status checks. However, some more advanced features, such as live online help or iPhone/smart phone applications serve customers across these department barriers. Web development theorists predict such services will become increasingly common as Table 3. Distribution of Vehicle Regulation Transaction Services by Division

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>9</td>
<td>8.4</td>
</tr>
<tr>
<td>Driver Licensing</td>
<td>25</td>
<td>23.4</td>
</tr>
<tr>
<td>Motor Carriers</td>
<td>18</td>
<td>16.8</td>
</tr>
<tr>
<td>Motor Vehicle Licensing</td>
<td>32</td>
<td>29.9</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
<td>21.5</td>
</tr>
</tbody>
</table>

state governments integrate online services to a greater degree. Driver licensing services, which include driver’s license renewal, DMV practice tests, organ donor registration and handicap placard application/renewal, constitute 25 services, nearly a quarter of all transaction services. There are currently 18 documented services for motor carriers, which include IFTA filing, IRP registration, fleet reports and UCR registration. Motor carriers have the fewest number of services of the divisions represented. Motor vehicle licensing, on the other hand, has the most services of any division, with 32 transaction services offered. These services pertain mostly to vehicle licensing, vehicle titling, personalized or specialty license plate purchases, title transfer notices and insurance verification. Services classified in the “Other” category are those which have no clear home agency, or are not obviously in the purview of vehicle regulation agencies or transportation cabinets/departments. Some examples include various business licenses, citation or toll payment, salvage yard auto hulk, emissions test results and misuse of state vehicle reports. Business licensing, along with citation and toll payment, could be in different departments depending on the state. Emissions tests and auto salvage could fall under vehicle licensing, but some states extend this authority to an environmental or other regulatory agency. Tasks like misuse of state vehicle reports could entail reports of misuse by state employees in any stage government agency, and so cannot be classified easily. Such tasks compose 21.5 percent of all catalogued tasks.

Table 4 displays the most common transaction services in the 49-state study. Every state has some sort of password, PIN or account management system used to store information about the user and allow for a secure online experience. While there are sometimes small differences in the way such accounts are set up and maintained, these services are essentially the same for all states. Change of address is another such feature, which updates a resident’s address for purposes of billing or contact. Vehicle registration renewal is the most common online service that has actually emerged as an alternative to traditional (e.g. office, phone or mail) vehicle regulation services. This is unsurprising given the utility of electronic vehicle registration renewal to states, which at a minimum must renew hundreds of thousands, if not millions of vehicles annually. Interestingly, states vary in some aspects of vehicle regulation. For example, several states charge a convenience fee for paying registration online, likely to cover the credit card vendor
fees associated with hosting such a payment system. However, Alaska charges a $10 fee to individuals renewing the registration fee in person, but the fee is waived for individuals renewing online. In Alaska, the focus is on incentivizing online registration because the state ultimately saves more money via online registration. Driving history record requests are also common for both individuals and companies. Twenty-eight states have adopted online purchase of viewable/printable driving history records to facilitate this process rather than have state employees exclusively process such requests, as is the case with duplicate registration, title records and liens. Major trucking programs, such as IRP and IFTA are also popular targets for state-based web applications, as are vehicle permits and decals. Also in the top tier of transaction services is online driver’s license renewal. There are several limitations with driver’s license renewals. For example, California allows residents to renew any class of license online provided there is no change of address, a verified Social Security number on record, the user has a DMV website account and the ability to pay online. Some states limit the number of consecutive online renewals allowed so that ID/license photos can be updated periodically. Another point of emphasis for states is specialty and personalized plates. Individuals are able to order plates in support of particular organizations or customized numbers and characters online in several states.

### Table 4. Most Common Transaction Services (Minimum ten states)

<table>
<thead>
<tr>
<th>Service/State</th>
<th>States with Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account/Password/PIN Management</td>
<td>49</td>
</tr>
<tr>
<td>Vehicle Registration Renewal</td>
<td>42</td>
</tr>
<tr>
<td>Driving History Records</td>
<td>28</td>
</tr>
<tr>
<td>International Registration Plan (IRP) Filing</td>
<td>27</td>
</tr>
<tr>
<td>Change of Address</td>
<td>26</td>
</tr>
<tr>
<td>Commercial Vehicle Permits/Decals</td>
<td>26</td>
</tr>
<tr>
<td>Vehicle Records (Title, Registration, Liens)</td>
<td>26</td>
</tr>
<tr>
<td>International Fuel Tax Agreement (IFTA) Tax Filing</td>
<td>22</td>
</tr>
<tr>
<td>Specialty Plates Ordering</td>
<td>21</td>
</tr>
<tr>
<td>Driver’s License/ID Renewal</td>
<td>20</td>
</tr>
<tr>
<td>Driver’s License Reinstatement</td>
<td>16</td>
</tr>
<tr>
<td>Organ Donor Registration</td>
<td>16</td>
</tr>
<tr>
<td>Personalized Plates Ordering</td>
<td>16</td>
</tr>
<tr>
<td>Schedule or Confirm DMV Appointment/Road Test</td>
<td>16</td>
</tr>
<tr>
<td>Duplicate Driver’s License or ID Card</td>
<td>14</td>
</tr>
<tr>
<td>Duplicate Vehicle Registration</td>
<td>13</td>
</tr>
<tr>
<td>Insurance Verification/Status</td>
<td>13</td>
</tr>
<tr>
<td>Fuel Tax/Weight-Distance Tax Filing</td>
<td>11</td>
</tr>
<tr>
<td>Traffic, Parking or Toll Citation Payment</td>
<td>11</td>
</tr>
<tr>
<td>Driver’s License Status Check</td>
<td>10</td>
</tr>
<tr>
<td>Sold Notice/Notice of Transfer</td>
<td>10</td>
</tr>
</tbody>
</table>
Such an offering, at least theoretically, makes it easier for customers to view such purchasing options and make a decision from the comfort of their own home or office. The table above contains several other applications, most of which are designed to generate more revenue and/or reduce the state’s administrative workload. There are 86 other applications that have been identified in nine or fewer states. One interesting finding is that 52 of the 107 identified transaction services were only discovered in one state, signifying a great deal of experimentation and differentiation among states in developing transaction services which fit their needs.

2.2 Information Services

The study uncovered 13 distinct information services offered on vehicle regulation website agencies. Table 5 lists the entire catalogue of information services. Every state provides downloadable publications and forms. Rather than attempting to quantify the number of publications and forms available for download on each site, each state was given credit if it had any such forms on its vehicle regulation website(s). There were a few special exceptions made for particular publications. Crash statistics, vehicle regulation statistics, revenue/budgetary statistics, driver’s license statistics, motor carrier statistics and campaign finance/lobbying data were all given a special status because they bring about an added value beyond simply informing citizens about what forms to complete or how to file online. These statistics provide information specific to vehicle regulation, traffic, budgets and special interest groups which may have a vested interest in transportation policy. While some states do not prioritize the information, there is great value in making it publicly available. According to the Sunlight Foundation, “transparency and openness are the very foundations for public trust” and a government should

<table>
<thead>
<tr>
<th>Service/State</th>
<th>States with Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downloadable Publications and Forms</td>
<td>49</td>
</tr>
<tr>
<td>Specialty Plates Browsing</td>
<td>38</td>
</tr>
<tr>
<td>State Traffic Information</td>
<td>34</td>
</tr>
<tr>
<td>Personalized Plates Searches</td>
<td>28</td>
</tr>
<tr>
<td>Crash Statistics</td>
<td>19</td>
</tr>
<tr>
<td>Vehicle Registration Statistics</td>
<td>18</td>
</tr>
<tr>
<td>Revenue/Budgetary Statistics</td>
<td>13</td>
</tr>
<tr>
<td>Driver’s License Statistics</td>
<td>12</td>
</tr>
<tr>
<td>DMV Wait-Time (Est.Minutes or Webcams)</td>
<td>7</td>
</tr>
<tr>
<td>Motor Carrier Statistics</td>
<td>3</td>
</tr>
<tr>
<td>Campaign Finance/Lobbying Data</td>
<td>2</td>
</tr>
<tr>
<td>Inspection Lane Video Feed</td>
<td>1</td>
</tr>
<tr>
<td>Public Notary Search</td>
<td>1</td>
</tr>
</tbody>
</table>
provide all public information online, so that it is truly accessible by the civic community.\textsuperscript{15} Citizens are therefore more likely to use a government agency’s web site if they trust the agency and the web site. And the foundation echoes the sentiment of web design professionals and information specialists who note the data must not only be online, but its quality and presentation are very important.\textsuperscript{16}

The other information services include a useful new feature meant to stabilize lines at vehicle regulation offices. On the agency web site states use either a counter which estimates the number of minutes one should expect to wait in line (e.g. New Mexico); other states utilize webcams in the lobby of agencies to the same end (e.g. Alaska). This feature would be more technically complicated in Kentucky, where motor vehicle registration services are located in all counties as opposed to regional service centers found in most other states. Most states allow users to browse specialty plates online even if such plates must be purchased in person in some of those states. Personalized plate searches allow for individuals to determine whether the special characters they desire on a custom license plate are available, even if the plate must be ordered in person. Given the distinction between being able to order the plates without going to the local DMV or filling out a form that must be mailed, these services were counted as information services.

\section*{2.3 State Comparison}

The mean number of services per state was 16.9, with an average of 4.6 information services and 12.3 transaction services per state. Therefore, the average state has roughly 15 percent of all existing services. Kentucky has 15 total services, comprised of four information services and 11 transaction services. These figures put Kentucky at slightly below the national average in all three categories, but the differences are not significant. Kentucky offers the following services:

- Account/Password/PIN Management
- Commercial Vehicle Permits/Decals
- Driving History Records
- Fuel Tax/Weight-Distance Tax Filing
- International Fuel Tax Agreement (IFTA) Tax Filing
- International Registration Plan (IRP) Filing
- Organ Donor Registration
- Permitting Agency/Service Provider Services
- Traffic School Online
- Vehicle Records (Title, Registration, Liens)
- Vehicle Registration Renewal


\textsuperscript{16} The Center for Public Integrity recently completed a State Integrity Investigation, comparing all 50 states in several categories of transparency, ethics and management. Overall Kentucky ranks 18\textsuperscript{th} in the country, but receives a C- from the agency.\textsuperscript{16} The reason for the grade is while Kentucky does well relative to other states, most states as a whole fail to meet the organization’s transparency standards. Kentucky does rank 10\textsuperscript{th} nationally in terms of public access to information. For more information, visit http://www.stateintegrity.org/
Table 6 provides a breakdown of total online services, number of information services and the number of transaction services provided per state. Topping the list is New York, which offers 39 online services. Also rounding out the top tier of states are Arizona (32), Virginia (32) and Florida (30). New York has the most transaction services (32), followed by Virginia (27), Arizona (23) and Florida (23). While rank the ordering of these states changes by shifting the focus from the total number of services to the number of transaction services, the fact that these states both comprise the top four positions in both categories separates them from all other states.

### Table 6. Number of Web Services by State (Total, Information, Transaction)

<table>
<thead>
<tr>
<th>State</th>
<th>Info</th>
<th>Trans</th>
<th>Total</th>
<th>State</th>
<th>Info</th>
<th>Trans</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>Montana</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Alaska</td>
<td>8</td>
<td>5</td>
<td>13</td>
<td>Nebraska</td>
<td>7</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>Arizona</td>
<td>9</td>
<td>23</td>
<td>32</td>
<td>Nevada</td>
<td>2</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Arkansas</td>
<td>4</td>
<td>13</td>
<td>17</td>
<td>New Hampshire</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>California</td>
<td>4</td>
<td>18</td>
<td>22</td>
<td>New Jersey</td>
<td>5</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Colorado</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>New Mexico</td>
<td>2</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Connecticut</td>
<td>4</td>
<td>5</td>
<td>9</td>
<td>New York</td>
<td>7</td>
<td>32</td>
<td>39</td>
</tr>
<tr>
<td>Delaware</td>
<td>3</td>
<td>9</td>
<td>12</td>
<td>North Carolina</td>
<td>5</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Florida</td>
<td>7</td>
<td>23</td>
<td>30</td>
<td>North Dakota</td>
<td>4</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>Georgia</td>
<td>3</td>
<td>15</td>
<td>18</td>
<td>Ohio</td>
<td>4</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Hawaii</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Oklahoma</td>
<td>3</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Idaho</td>
<td>4</td>
<td>14</td>
<td>18</td>
<td>Oregon</td>
<td>8</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>Illinois</td>
<td>4</td>
<td>14</td>
<td>18</td>
<td>Pennsylvania</td>
<td>6</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Indiana</td>
<td>4</td>
<td>18</td>
<td>22</td>
<td>Rhode Island</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Iowa</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>South Carolina</td>
<td>4</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Kansas</td>
<td>5</td>
<td>7</td>
<td>12</td>
<td>South Dakota</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Kentucky</td>
<td>4</td>
<td>11</td>
<td>15</td>
<td>Tennessee</td>
<td>6</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>Louisiana</td>
<td>3</td>
<td>16</td>
<td>19</td>
<td>Texas</td>
<td>6</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>Maine</td>
<td>3</td>
<td>17</td>
<td>20</td>
<td>Utah</td>
<td>5</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Maryland</td>
<td>5</td>
<td>19</td>
<td>24</td>
<td>Vermont</td>
<td>4</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>6</td>
<td>19</td>
<td>25</td>
<td>Virginia</td>
<td>5</td>
<td>27</td>
<td>32</td>
</tr>
<tr>
<td>Michigan</td>
<td>5</td>
<td>13</td>
<td>18</td>
<td>Washington</td>
<td>5</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1</td>
<td>14</td>
<td>15</td>
<td>West Virginia</td>
<td>7</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Mississippi</td>
<td>2</td>
<td>8</td>
<td>10</td>
<td>Wisconsin</td>
<td>8</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>Missouri</td>
<td>3</td>
<td>14</td>
<td>17</td>
<td>Wyoming</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>
in the study. Information services rankings show less similarity, although Arizona, New York and Florida remain highly ranked in those categories as well. The vast majority of states have more functioning transaction services than they do a diversity of information services. Just four states – West Virginia, Wyoming, Alaska and South Dakota – have more information services documented than transaction services.

**Figure 1. Total Number of Web Applications by State**

Figure 1. provides some geographic visualization of the data. Note that most states in the top two categories are large states in terms of population. This suggests states with more residents have the strongest incentives to adapt E-Government services in order to reduce costs and waiting times at DMV (or state equivalent) Centers. This is consistent on the other end of the scale, where sparsely populated states like Wyoming, South Dakota, Iowa and New Hampshire have less to gain from implementing such technology, because those states expend fewer resources on traditional public services. Data backs up such a supposition. In fact, the correlation between number of total services and 2010 Census population is .497. The correlation between number of transaction services and 2010 Census population is .500. This data alone does not imply a causal relationship but a correlation of .300 or greater is ample evidence of association between two variables – in this case population and total (or transaction) services.

To expand on possible connections between state attributes and number of services, some other data was gathered and basic correlations were run to examine the association between total web services and population, per capita income, number of licensed drivers, number of

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17 U.S. Census Bureau. “
Table 7 displays the correlation coefficients for total services in each state and the variables described in the previous paragraph. The data for number of licensed drivers and licensed vehicles are, at least in part, a function of population. Therefore, it is no surprise to see similar correlation coefficients for the number of licensed drivers and vehicles in a state. Obviously wealth could interact with these numbers in complex ways, but generally speaking larger populations will require more driver’s licenses and licensed vehicles, and ultimately, more web-based government services. The IRP fleets variable is weakly correlated with the number of web services offered by state vehicle regulation agencies. State and federal trucking laws often create incentives for companies to register in different states than the primary state of operation, which could explain the weaker correlation. The transportation expenditures variable is the three-year average of a state’s percentage expenditure on transportation spending. Surprisingly, there is a negative relationship between the percentage of transportation spending in the budget and the number of vehicle regulation applications on a website. States spending more money as a percentage of their overall budget should theoretically be able to devote more emphasis on web or information technology development; however, this is clearly not the case. Without knowing how much money is allocated to website improvement and development in each state, it appears that the assumption that states with more resources would spend more money to develop more services is unreliable.

Table 7. Correlation between Total Services and State Attributes

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>0.497</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>0.138</td>
</tr>
<tr>
<td>Licensed Drivers</td>
<td>0.502</td>
</tr>
<tr>
<td>Licensed Vehicles</td>
<td>0.456</td>
</tr>
<tr>
<td>IRP Fleets</td>
<td>0.282</td>
</tr>
<tr>
<td>Transportation Expenditures</td>
<td>-0.304</td>
</tr>
</tbody>
</table>

20 Ibid.
2.4 Chapter Summary

The study identified 107 unique interactive services, and 13 unique information services on state vehicle regulation agency web sites. Driver licensing services, which include driver’s license renewal, DMV practice tests, organ donor registration and handicap placard application/renewal, constitute 25 services, nearly a quarter of all transaction services. There are currently 18 documented services for motor carriers, which include IFTA filing, IRP registration, fleet reports and UCR registration. Motor carriers have the fewest number of services of the divisions represented. Motor vehicle licensing, on the other hand, has the most services of any division, with 32 transaction services offered. The most common transaction services offered in state are Account/Password/PIN management, vehicle registration renewal, driving history records and IRP filing. The most common information services offered are downloadable publications and forms, specialty plates browsing, state traffic information and personalized plate searches. The mean number of services per state was 16.9, with an average of 4.6 information services and 12.3 transaction services per state. Therefore, the average state has roughly 15 percent of all existing services. Kentucky has 15 total services, comprised of four information services and 11 transaction services. Topping the list is New York, which offers 39 online services. Also rounding out the top tier of states are Arizona (32), Virginia (32) and Florida (30). New York has the most transaction services (32), followed by Virginia (27), Arizona (23) and Florida (23). Correlations were calculated between each state’s number of total services and transaction services and population, number of licensed drivers, number of registered vehicles, per capita income, IRP fleets and transportation expenditures. States with larger populations, number of registered vehicles and drivers tend to have more total services and transaction services. Although the findings are not causal, they suggest larger states may have a greater incentive to develop web applications because of the financial strain of handling vehicle and driver credentialing and licensing via field offices, phone calls and mail. IRP fleets, which can be thought of as a proxy measure for the size of the trucking industry in a particular state, is positively related to the number of web applications as well, although the strength of the relationship is not as strong. Surprisingly, the percentage of state budget dollars spent on transportation expenditures from 2009 to 2011 is negatively related to the number of web applications a state has. The reasons for this pattern are unclear. Per capita income has virtually no relationship with the number of web applications a state has.
Chapter 3. Website Usage Trends and Financial Impact

During the early stages of the study, several rounds of a survey were sent to vehicle regulation officials in each state. The survey contained the following questions and requests for information:

1. The number of Web site visitors (or unique Web site visitors) each year for the last five years.

2. The number of annual online transactions performed online each year; if available, the number of transactions performed for each online service you offer.

3. The amount of revenue generated from online transactions per year.

4. The percentage of department business (in terms of either transactions and/or revenue) conducted online vs. more traditional methods (walk-ins/phone/mail) in the last five years.

5. Which credit cards you accept for online payments, and whether there are any associated convenience fees or transaction fees.

6. Whether you take any payments other than credit cards (such as ACH or electronic check).

7. Any estimates you may have about the amount of money saved using online transactions.

8. Do you make use of any particular Web design consultants and/or software the Kentucky DVR might find useful?

As stated in Chapter 1, there were responses from 23 states. These responses varied greatly in terms of detail and specificity. As a result, it was not possible to compile a systematic analysis of usage trends or finance impact. In terms of web usage, proxy measures were created in order to compare all states. For the other survey questions, anecdotal results are reported based on available responses.

3.1 Web Usage Statistics

There are several ways in which web site administrators quantify web usage. Web page visits are one such measure. This measure is essentially a counter that registers a “hit” every time a user accesses a particular web page or website portal. Website hits can be a problematic measure, however, because the number can be inflated by repeat visits to the page, thereby distorting the true number of visitors. Another, and perhaps better, way to quantify web site usage looks at unique visitors or people. This measure counts only unique users by counting unique IP addresses plus a further identifier, such as registration information, cookie or user agent. States surveyed were asked to provide either piece of information.
Table 8 displays web site visitor and unique visitor tallies for vehicle regulation websites in states reporting such data. Idaho, Nevada, New York, North Carolina, Oregon, South Dakota, Texas, Utah, Vermont, Washington and West Virginia all provided estimates for total visitors for a year between 2007 and 2010. The total visitors statistic varies wildly, from 36,211 in South Dakota to New York at 83,943,161, both numbers from 2009. It is likely these numbers are not derived using consistent methodology, so it is difficult to compare them. Oregon has provided multiple years of data, so their numbers are interesting to note because they have been tracked in the same way. Between 2007 and 2010, Oregon’s total visitors increased 16.5 percent, and the number of unique visitors increased by 40.6 percent. Washington, the only other state reporting multiple years of data, also shows a significant increase in total visitors between 2009 and 2010. Although the data are very limited, one could tentatively conclude the trends seem to show a significant increase in website traffic.

In order to compare usage rates more broadly, the Google AdWords and Quantcast estimation techniques were employed (for detailed information about the methodology, see Chapter 1). In order to derive annual estimates, the global monthly search estimates must be multiplied by 12. These numbers have much higher variation than visitor measures, with a low of 606,384 DMV-related searches for Wyoming and a high of 173,515,056 estimated DMV-related searches for California. The immediate takeaway is that these numbers are in large part a function of population. The algorithms used to estimate the Google search indexes for geographic locations must be heavily weighted based on population. To test this assumption, one must correlate the measure with the Census Population figures used in Chapter 2. The correlation is a staggering .913, which means the search estimates are probably estimated in large part using population.
statistics. As a result, this analysis does not yield much insight, aside from the rather obvious insight that larger states probably enjoy more website hits.

A second estimation technique for website usage was constructed using the traffic estimation statistics from the service Quantcast (for detailed information about the methodology, see Chapter 1). Table 9 shows the association between this measure and selected variables. Unlike the Google AdWords, instead of estimating and indexing search phrases, this software locates the portal webpage for the URL entered and derives an estimation based on unique users, or people using the website. The numbers for January 1 to January 31, 2012 were used. The state mean was taken for states with vehicle regulation services spread across multiple web sites. Surprisingly, there was much less correlation (.275) with state population than using the previous metric, meaning the Quantcast estimates were not as heavily driven by population figures. The analysis then turns to the association between the number of people estimated to be using each state’s website(s) and the number of web applications, licensed drivers and licensed vehicles. There is no significant correlation between the estimated number of users and total functions (.217), or even transaction functions. However, there is modest covariance between the estimated number of users and number of licensed drivers (.372) and number of registered vehicles (.329). So, perhaps states with more drivers and vehicles tend to have more users, which is a relatively intuitive finding. Perhaps these are better correlates than population, because merely living in a state does not mean one necessarily drives or owns a vehicle. In fact, many people living in urban areas of populous states do not own vehicles or drive at all. Two other measures, per capita income and IRP fleets, were also tested. IRP fleets (.271) are approaching the level of correlation where one might find a meaningful association, but nothing too significant. On the other hand, per capita income and usage rates have almost no association whatsoever (.073).

Table 9. Correlation Coefficients for Quantcast Usage Estimates and Selected Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>0.275</td>
</tr>
<tr>
<td>Total Web Services</td>
<td>0.217</td>
</tr>
<tr>
<td>Licensed Drivers</td>
<td>0.372</td>
</tr>
<tr>
<td>Licensed Vehicles</td>
<td>0.329</td>
</tr>
<tr>
<td>IRP Fleets</td>
<td>0.271</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>0.073</td>
</tr>
</tbody>
</table>

3.2 Transaction Numbers

A transaction is an exchange or transfer of goods. These goods can be money, information, services, products, etc. More important than directing users to the website is actually getting them to take advantage of its functionality. Converting traditional services to online services is a process, and getting a critical mass of users to use E-Government services is the ultimate goal. In the survey response, some states provided highly specific feedback about specific services and transactions, while others just provided top-level numbers for total transactions. It should be noted that some states count transactions differently than others. Whereas some states count any
completed transaction, others only count transactions which include monetary exchanges. This makes it difficult to compare transaction numbers between states.

Figure 2. Vehicle-Related Web Transactions by State (2005-2010)

Figure 2 demonstrates web transactions conducted on vehicle regulation agency websites from 2005 to 2010. Some states do not provide relevant data for all five years, so the trend lines are incomplete for all states except Arizona. However, a clear pattern has emerged. Alaska, New York and Idaho are all trending steadily upward, although none of those states have as many transactions as Arizona or Virginia. To some extent, Arizona and Virginia have significantly more transactions because they offer more services, particularly compared to Alaska and Idaho. However, New York has nearly as many services and far fewer services. This is because New York is counting its transactions differently. Arizona and Virginia realized small dips in the total number of transactions during the time period. These reasons are unclear. There may be some recessionary effects, but just as likely the way transactions were counted changed during the time period. Such maturation effects are difficult to assess without greater knowledge specific to those state systems.

Nonetheless, the clear pattern is toward greater use of web services, particularly the most popular and widely used for transactions. Table 10 provides details about the increase in the number of online vehicle renewals in each state between 2006 and 2010. The table reveals significant increases in online renewals in Alaska, Arizona, Minnesota, Oregon, Texas, Vermont and Virginia. In fact, renewals increased with such rapidity in these seven states that the mean percentage increase was 78 percent. The number of online registrations as a percentage of all vehicle registrations is 10 percent for all states in 2006, and increases to 18 percent of all renewals in 2010. Nearly 40 percent of all vehicles registered in Arizona are renewed online.\(^{23}\)

\(^{23}\) This ratio was calculated by taking the number of renewals provided in the state surveys and dividing by the total number of vehicles registered in a state, as reported by the Federal Highway Administration. Such a measure includes all automobiles, buses and trucks, both privately and publicly owned. Motorcycles are not included.
Table 10. Number of Online Vehicle Registration Renewals by State (2006-2010)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>62,521</td>
<td>90,188</td>
<td>44</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Arizona</td>
<td>995,380</td>
<td>1,687,544</td>
<td>70</td>
<td>24</td>
<td>39</td>
</tr>
<tr>
<td>Minnesota</td>
<td>303,576</td>
<td>378,527</td>
<td>25</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Oregon</td>
<td>131,666</td>
<td>225,559</td>
<td>71</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Texas</td>
<td>774,693</td>
<td>1,539,174</td>
<td>99</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Vermont</td>
<td>56,000</td>
<td>146,000</td>
<td>161</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>Virginia</td>
<td>824,250</td>
<td>1,528,802</td>
<td>85</td>
<td>12</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total/Mean</strong></td>
<td>3,148,086</td>
<td>5,595,794</td>
<td>78</td>
<td>10</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 11 shows the online driver’s license renewals in the state of Virginia. The trend toward greater usage of the online renewal system for driver’s license renewals is generally positive, albeit less pronounced. In order to determine the estimated percentage of online renewals, the number of licensed drivers in Virginia was divided by eight, as driver’s licenses in Virginia are good for eight years. This provides an approximation of licenses renewed each year. The number of online renewals was divided by the number of estimated renewals to generate an estimated percentage of renewals conducted that were transacted online. The estimated percentage of online renewals dips slightly in 2007 and 2008, but only marginally. In 2009 and 2010, these numbers increase significantly, by 2.3 and 4.1 percentage points, respectively. Furthermore, there is good reason to believe these estimates are conservative because not all licensed drivers are eligible for online renewals (e.g. first-time drivers, new residents, or people with expired licenses). As such, the number of people eligible for online renewals is actually lower than estimated, although the exact number is unclear without more information. In sum, the usage rates for driver’s licenses appear to increase for the most recent years available in a state with a highly functioning DMV online transaction system.

Table 11. Online Driver’s License Renewals in Virginia

<table>
<thead>
<tr>
<th>Year</th>
<th>Online Renewals</th>
<th>Licensed Drivers</th>
<th>Estimated Renewals</th>
<th>Estimated % Online Renewals</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>136,258</td>
<td>5,210,685</td>
<td>651,336</td>
<td>20.92</td>
</tr>
<tr>
<td>2007</td>
<td>136,492</td>
<td>5,259,512</td>
<td>657,439</td>
<td>20.76</td>
</tr>
<tr>
<td>2008</td>
<td>128,582</td>
<td>5,301,182</td>
<td>662,648</td>
<td>19.40</td>
</tr>
<tr>
<td>2009</td>
<td>145,171</td>
<td>5,347,745</td>
<td>668,468</td>
<td>21.72</td>
</tr>
<tr>
<td>2010</td>
<td>174,624</td>
<td>5,402,347</td>
<td>675,293</td>
<td>25.86</td>
</tr>
</tbody>
</table>
These trends are equally evident with trucking permits issued to motor carriers in Virginia. Table 12 reports the number of online trip permits issued each year for 2006 to 2009. The increase for each year in the table is significant, as with other services. Part of the increase could be reflective of overall increases in truck permits in the state, and not a greater shift to online permit issuance. The total number of trip permits issued was not collected. However, it is unlikely such increases tell the entire story, particularly given the increase from 2008 to 2009, when a flagging economy would presumably have a deleterious effect on the total number of companies requesting trip permits.

Table 12. Online Truck Permits Issued in Virginia (2006-2009)

<table>
<thead>
<tr>
<th>Year</th>
<th>Online Trip Permits</th>
<th>Increase</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>9,173</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>11,266</td>
<td>2,093</td>
<td>23</td>
</tr>
<tr>
<td>2008</td>
<td>12,847</td>
<td>1,581</td>
<td>14</td>
</tr>
<tr>
<td>2009</td>
<td>14,960</td>
<td>2,113</td>
<td>16</td>
</tr>
</tbody>
</table>

3.3 Revenues

Usage rates and transaction numbers are two ways to examine the trends toward more E-government usage at the state level. However, another way to analyze the merits and trends in online government services involves revenues generated from those services. Longitudinal trends show the progression of revenue collection via online methods. Distribution of revenues will signify which services yield the greatest amount of income. An examination of the proportion of overall revenue generated by web-based transactions will provide some insight into the long-term prospects for both E-Government services and traditional services.

Figure 3 shows the revenues generated from online services offered by the Texas Department of Motor Vehicles from 2005 through 2010. Texas was the only state to report online revenues over a period of time. The three services in the graph are vehicle registration renewal, IRP registration fees, and motor carrier credentialing. IRP data is only shown from 2007 to 2010, so there is no bar for IRP data in 2006 and 2007. The vehicle registration and IRP registration data show a clear monotonic, almost linear increase for both types of transactions. Revenue for online vehicle registrations more than doubled over the five-year period, from $34.9 million in 2005 to $78.1 in 2010. Specifically, there was a 124 percent increase in online vehicle registration revenue. IRP revenues also jumped sharply over a four-year period, from $26 million to $50 million in 2010. The only countervailing trend is shown with motor carrier credentialing, which increases from 2005 to 2007 and declines thereafter. Whether this decline is due to economic factors, changes in the credentialing fees, the implementation of the IRP or some other cause is unknown. However, such trends appear to be the exception to the rule. The general flow of the data indicates a fast level of growth, as companies and individuals embrace the efficiency and flexibility of online transactions.
Idaho was the only state to report a complete breakdown of all online revenues generated in a particular fiscal year. Figure 4 displays the revenues generated by the state’s online vehicle regulation transaction services in 2009. The total revenue reported by the state that year totaled nearly $19.8 million. The largest source of online revenue was the online vehicle registration renewal service, which brought in more than $8.2 million, or 41.6 percent of all online revenue. Next, driver’s license records brought in nearly $5.2 million, or 26.1 percent of all revenues. Third largest are commercial vehicle renewal fees, which top $3 million and constitute 15.6 percent of all revenues. These top three revenue sources comprise roughly 83 percent of all revenues generated through Idaho’s DMV and Trucking agencies via web services. License reinstatement, temporary trip permits and over-legal permits bring in between $800,000 and $900,000 each, and as such are responsible for roughly 13 percent of revenues. The rest is split between personalized license plates, hazmat endorsements, and motor vehicle records. In Idaho, most of the revenue is concentrated in three services; however, there are substantial cost savings related to all services offered, as there are lower demands for administrative labor and the related costs associated with having extra workers to process all of those transactions.

In Arizona, records show online transactions are fast becoming a substantial part of the Arizona Department of Transportation’s (ADOT) overall revenue structure. Between 2006 and 2010, the percentage of vehicle-related transaction revenue collected from online services rose from 16 to 21 percent. The steady increase in the amount of revenue should be expected to continue as the public gravitates to online government services, and state governments eliminate traditional services due to budgetary constraints.
3.4 Realized Savings

Currently there is no comprehensive study of savings realized by departments of vehicle regulation in all U.S. states related to implementation of online services. The survey did solicit several interesting responses from states surveyed about particular costs saved as a result of switching to or at least adding a web-based option:

- Officials in Utah do not have a specific amount of money saved to report, but the number of online transactions constitute a larger number than those processed by any single DMV office in the state, which is typically staffed with 60 employees. As a result of employing the online transaction system, officials estimate they have been able to avoid building a new DMV center in order to serve all the extra customers. The state has also installed kiosks which allow residents to purchase driving history records and renew vehicle registrations.

- Wisconsin estimates online renewals has eliminated 40,000 hours of labor costs, and has allowed the state to hire fewer DMV employees.

- Vermont officials have anecdotally noticed fewer visits, calls and shorter wait times, but have not researched the matter formally.
A couple of other examples, which apply to E-Government more generally, provided by consulting firm NIC Inc., which does work with several states:

- NIC Inc. estimates its statewide E-Government services saved more than $10 million in West Virginia by allowing the elimination of surplus infrastructure, technology and application development costs.
- NIC also estimates the online services it helped to implement in Utah allowed the state to adopt a four-day workweek and saved taxpayers $4 million during the first year of operation.

### 3.5 Vendors of Online Government Services

NIC currently provides self-funded E-Government services in 23 states. Figure 5 shows which states have governmental partnerships with the organization. Most of these states have a self-funded online government services model that allows them to charge transaction fees in exchange for NIC’s services, which are to build and manage online government transaction systems. Most of the organization’s work is done with motor vehicles, transportation and trucking, professional licensing, outdoor licensing and the secretary of states’ offices. These services require no upfront investment of taxpayer money in most cases – the system is designed to pay NIC as transactions are processed.

**Figure 5. NIC Governmental Partnerships**
Kentucky currently has a partnership with NIC for its portal site, kentucky.gov, and works with NIC to do work for motor vehicles and driver history records. The NIC presence is not necessarily in motor carriers in each state, but there is a partnership for at least some online government services.

Table 13 reports all other partnerships reported by the survey respondents. NIC is prominent for several state departments, however each state seems to vary in terms of their selection of other consultants (or managers) and software used. Although not reported in the chart, several states have developed custom software to process transactions online. The variation in firms and software suggests states are at least somewhat experimental in approach and choose unique solutions to their E-Government challenges.

**Table 13. Reported Vendors and Software Used**

<table>
<thead>
<tr>
<th>State</th>
<th>Consultants/MGMT</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>Irwin Hodson</td>
<td>--</td>
</tr>
<tr>
<td>Arizona</td>
<td>IBM</td>
<td>Service Arizona EZ-Renewal</td>
</tr>
<tr>
<td>Idaho</td>
<td>Access Idaho</td>
<td>--</td>
</tr>
<tr>
<td>Kentucky</td>
<td>NICUSA/Kentucky Interactive</td>
<td>--</td>
</tr>
<tr>
<td>Missouri</td>
<td>Internal IT Staff</td>
<td>Dreamweaver</td>
</tr>
<tr>
<td>Nevada</td>
<td>ITI Technologies</td>
<td></td>
</tr>
<tr>
<td>North Dakota</td>
<td>--</td>
<td>Websphere, J2EE, DotNet</td>
</tr>
<tr>
<td>Oregon</td>
<td>--</td>
<td>TeamSite; SharePoint</td>
</tr>
<tr>
<td>Texas</td>
<td>MCCS, NIC USA, Explorer Information Services</td>
<td>--</td>
</tr>
<tr>
<td>Utah</td>
<td>NIC USA/Utah Interactive</td>
<td>--</td>
</tr>
<tr>
<td>Vermont</td>
<td>NIC USA</td>
<td>--</td>
</tr>
<tr>
<td>Washington</td>
<td>Anthro-Tech</td>
<td>CyberSource</td>
</tr>
</tbody>
</table>
3.6 Credit Cards and Transaction Fees

Table 14. Credit Card Policies by State

<table>
<thead>
<tr>
<th>State</th>
<th>MasterCard</th>
<th>Visa</th>
<th>Discover</th>
<th>American Express</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Arizona</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Colorado</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Idaho</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Indiana</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes (DL/ML)</td>
<td>Yes (DL/ML)</td>
</tr>
<tr>
<td>Louisiana</td>
<td>Yes (MC)</td>
<td>Yes (MC)</td>
<td>No (MC)</td>
<td>Yes (MC)</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Missouri</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Nevada</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>New York</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>North Dakota</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Oregon</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes (MC)</td>
<td>No</td>
</tr>
<tr>
<td>South Dakota</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Texas</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Utah</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Vermont</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Virginia</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Washington</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wyoming</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*MC = Motor Carriers, DL = Driver Licensing, ML = Motor Vehicle Licensing

Table 14 shows the credit card policies for states who responded to that question on the survey. In some instances, responses are denoted with MC, DL or ML to indicate a particular division’s policy, which may or may not be the policy for the entire department of vehicle regulation or agency equivalent. All but one of the 23 states mentioned take credit cards of some sort, with Wyoming being the exception. Every state offering a credit card option accepts MasterCard and Visa cards for online transactions. Sixteen states accept Discover cards for online transactions, and 14 accept American Express.
<table>
<thead>
<tr>
<th>State</th>
<th>Convenience Fee</th>
<th>E-Check/ACH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Arizona</td>
<td>No response</td>
<td>Yes</td>
</tr>
<tr>
<td>Colorado</td>
<td>2.25% if fee + $.75 per transactions</td>
<td>No response</td>
</tr>
<tr>
<td>Idaho</td>
<td>No response</td>
<td>Yes</td>
</tr>
<tr>
<td>Indiana</td>
<td>2.3% of transaction fee + $1 per transaction</td>
<td>Yes</td>
</tr>
<tr>
<td>Kentucky</td>
<td>$2-3 (DL); $5 (ML)</td>
<td>Yes (MC)</td>
</tr>
<tr>
<td>Louisiana</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Minnesota</td>
<td>No response</td>
<td>Yes</td>
</tr>
<tr>
<td>Missouri</td>
<td>Sliding scale based on registration fee</td>
<td>Yes</td>
</tr>
<tr>
<td>Nevada</td>
<td>None, paid by $5 mil leg appropriation</td>
<td>Yes</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>None convenience fee</td>
<td>No</td>
</tr>
<tr>
<td>New York</td>
<td>$5 convenience fee</td>
<td>Yes</td>
</tr>
<tr>
<td>North Carolina</td>
<td>No response</td>
<td>Yes (IRP)</td>
</tr>
<tr>
<td>North Dakota</td>
<td>No, ND assumes costs</td>
<td>Yes (MC)</td>
</tr>
<tr>
<td>Oregon</td>
<td>No response</td>
<td>No response</td>
</tr>
<tr>
<td>South Dakota</td>
<td>$1 fee</td>
<td>Yes</td>
</tr>
<tr>
<td>Texas</td>
<td>$2 service fee for vehicle reg; $1 for MCCS</td>
<td>Yes (MC)</td>
</tr>
<tr>
<td>Utah</td>
<td>None</td>
<td>No response</td>
</tr>
<tr>
<td>Vermont</td>
<td>$2 for newer online services, 0 for VR</td>
<td>No</td>
</tr>
<tr>
<td>Virginia</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Washington</td>
<td>Yes, not specified</td>
<td>No</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>$.50 to $152, sliding scale</td>
<td>Yes</td>
</tr>
<tr>
<td>Wyoming</td>
<td>N/A</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 15 shows the transaction fees (for electronic transactions) and whether each state accepts electronic checks as forms of payment for online transactions. As the table shows, convenience fees vary wildly by jurisdiction. Some states, such as Alaska, Louisiana, Nevada, New Hampshire and Utah, have no convenience fees. Nevada has appropriated money to cover the related costs of processing electronic payments. As stated earlier, Alaska actually places a surcharge on traditional vehicle registrations in order to incentivize online transactions. Some states have a standard rate for all transactions, whereas other states have a fee that is a percentage of the transaction value. Wisconsin has a sliding scale of $.50 to $152.

Electronic checks or ACH payments are accepted in 14 states; 6 states do not accept such payments; three states tendered no response. In several cases, (MC) or (IRP) is noted to indicate electronic payments are only accepted in the motor carriers division or for the IRP program.
3.7 Chapter Summary
A survey was developed and disseminated to every state’s vehicle regulation agency or agencies in an effort to collect information about the number of website visitors, annual online transactions, revenues generated from online transactions, percentage of department business conducted online, which credit cards are accepted, and whether other forms of payment are accepted. Respondents were also asked to estimate how much money the agency saved by implementing online services, and whether they had partnerships with any information technology consultants. Survey results generally indicate a steady increase in web site traffic, online transactions, and business share, although the economic recession (which began in 2007) has caused these trends to slow or plateau. An attempt to find proxy measures for website usage was made since few states provided detailed website usage information. Two such measures were developed, using Google AdWords and Quantcast analytic services. The Google AdWords measure turned out to be highly correlated with population, vehicle registration and licensed drivers. States with more residents would be expected to have more website traffic, providing a rather intuitive finding. Quantcast estimates had the strongest relationships to population, vehicle registration and licensed driver, though the magnitude of the relationship was not as strong. Revenue figures from the state of Texas show a steady increase in the amount of revenue generated from online sales for vehicle registrations and IRP registration, although commercial vehicle revenue increased from 2005 to 2007 before declining from 2008 to 2010. However, the general flow of the data indicates a fast level of growth, as companies and individuals embrace the efficiency and flexibility of online transactions. No comprehensive studies of cost savings have been conducted, but several states reported anecdotal evidence of significant cost savings realized through adoption of E-Government services for vehicle regulation. Several states have some form of partnership for online government services. NIC Inc. is a company with partnerships in 23 states, including Kentucky. However, many states do some if not all web design and development in-house. As a result, there are a variety of approaches to vehicle regulation websites. For example, states have vastly different policies regarding credit and debit card service charges, even though most of them accept the same credit cards.
Chapter 4. Web Design

As stated in Chapter 1, web design is an amorphous term whose meaning can change depending on a particular point of emphasis. In order to provide a systematic evaluation of all states, some quantitative metrics were taken using the W3C’s Unicorn Validator tool to assess the quality of the HTML code, CSS code and mobile compatibility. Xenu Link Sleuth software assessed the maintenance of web site HTML codes, and the Web Accessibility Checker to assess Section 508 accessibility requirements. Hubspot’s Marketing Grader was used to grade each site’s marketing strength.

4.1 W3C Unified Unicorn Validator

The W3C Unified Unicorn Validator allows users to check the HTML, CSS, RSS and mobile compatibility checker. The user copies the URL address of the website of interest into the field, selects the appropriate test via the dropdown menu and the tool computes the number of errors and warnings for each type of check. The results page displays the number of errors and warnings, along with detailed feedback. Detailed feedback for each error and warning are provided by the tool.

HTML, or HyperText Markup Language, is used to create documents on the Internet. HTML is used to define document structure through use of various tags and attributes. W3C helped develop the initial standards for HTML in 1994, but various companies developing browser software did not wait for those standards to be put in place. Netscape, Microsoft and other early browser developers devised their own tags and attributes, both in a hurry to corner large pieces of a competitive market. This resulted in lots of HTML codes that were only compatible with particular browsers, and created compatibility issues for users on websites designed for a particular browser, among other issues. Such a situation is antithetical to the original intent of HTML.\(^{24}\) The situation has improved in recent years, and browser compatibility issues are less common. However, websites often fail to meet HTML standards, which affect the accessibility, future compatibility and download speed. It also may make future development of websites take longer if code has to be rewritten in order to be compliant with standards.

The W3C Unified Unicorn Validator returned two metrics – HTML warnings and HTML errors. Warnings mean the code will execute, but the results may not be those intended by the programmer. Errors mean the program will not execute. These metrics were calculated for all 81 state vehicle regulation websites. In order to provide comparable scores for all states, the mean score was used for states with more than one website in the index.\(^ {25}\)

The next test was a CSS validation process. CSS, or Cascading Style Sheets, refer to the way a document is presented to the user, particularly the display or delivery mechanism. CSS can be used to give programmers control over the typography, colors, alignment, layout, etc. CSS provides designers with several advantages, including greater typography page layout control,


\(^{25}\) A comprehensive list of HTML error codes and their meanings can be found at: http://validator.w3.org/docs/errors.html
less programming work, simpler documents and code, more accessible documents, replaces presentational HTML and is well supported on all browsers. As with the HTML validation process, the CSS process yields metrics for CSS warnings and CSS errors.

Last, the Unicorn Validator tests of compatibility of the web page with mobile devices. These tests examine how well a particular web page can be accessed and used on a mobile device. As with the other tests, the MobileOK Checker yields metrics for errors and warnings related to mobile display and usability.

Table 16. W3C Unicorn Validator Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>HTML Errors</th>
<th>HTML Warnings</th>
<th>CSS Errors</th>
<th>CSS Warnings</th>
<th>Mobile Errors</th>
<th>Mobile Warnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>48.6</td>
<td>12.6</td>
<td>56.7</td>
<td>1257.3</td>
<td>12.8</td>
<td>13.8</td>
</tr>
<tr>
<td>Median</td>
<td>22</td>
<td>5</td>
<td>16.5</td>
<td>463</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Stand. Dev.</td>
<td>59.8</td>
<td>18.9</td>
<td>140.2</td>
<td>1937.9</td>
<td>3.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Maximum</td>
<td>268</td>
<td>80</td>
<td>901</td>
<td>8947</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>Kentucky</td>
<td>97</td>
<td>80</td>
<td>901</td>
<td>8947</td>
<td>19</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 16 shows some summary statistics regarding the battery of tests run in the Unicorn Validator for the 49 states. The mean and median statistics are both reported because there tends to be a skewed distribution of errors and warnings at the high end of these scales, which tend to distort the mean number of errors. Therefore, the means tend to be less biased indicators. There were fewer errors and warnings reported for the HTML and mobile compatibility checks than the CSS checks. This is probably due in part to the specificity of the checks. However, as indicated by the minimum (or, by W3C standards, “best”) scores there are at least some states who are completely compliant with these existing web standards, or at least very close. North Dakota has only two HTML errors on one of its vehicle regulation websites and zero on the other. Utah has only one HTML error on its website. Ten states have a website (or websites) with no HTML warnings at all. Several state sites have no CSS errors at all, despite an average of 56.7 for all states. CSS warnings is a category with a high degree of variability, but two states (South Dakota and Alabama) have fewer than 10. Utah’s site has the lowest number of mobile device errors, with three. Wisconsin only had one mobile warning code. On the other end of the spectrum, there are states with high numbers of errors. Virginia tops the list for HTML errors with 268. Kentucky topped the list with 80 HTML warnings. Kentucky tops the list for CSS errors with 901 (as well as the high for CSS Warnings with 8947). Arizona has a high number of mobile compatibility errors at 24. Topping the list for number of mobile web compatibility errors was California at 22.

Given the anecdotal presence of Virginia, California and Arizona at the top of the errors/warnings lists, as well as North Dakota at the bottom, it made sense to see if there was any

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association between the number of web applications and web standards, the informal hypothesis
being sites with more complex functionality are more apt to have programming errors. However,
there are no significant correlations between the number of overall web services or transaction
services with the number of HTML, CSS or mobile errors or warnings.

In sum, most state vehicle regulation websites do not entirely conform to prevailing web design
standards set forth by W3C. HTML compliance seems to be less problematic than CSS, which
makes sense given HTML is the older programming language. Mobile devices are relatively
new, and as states begin to develop smartphone and tablet applications, the standards will
undoubtedly evolve and change.

4.2 Link Sleuth
The Link Sleuth software indexes all of the hyperlinks on each site, provides the link status, type,
size, title, date, level, out links, in links server and error message. The final results for each state
were compiled in a report, which details summary results for each of the state web pages
previously documented.27

Table 17. Link Sleuth Analysis Results

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Correct URLS</th>
<th>Total URLS</th>
<th>% Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2,672.0</td>
<td>3,259.7</td>
<td>90.5</td>
</tr>
<tr>
<td>Median</td>
<td>458.0</td>
<td>555.0</td>
<td>96.3</td>
</tr>
<tr>
<td>Minimum</td>
<td>2.0</td>
<td>2.0</td>
<td>15.1</td>
</tr>
<tr>
<td>Maximum</td>
<td>117,942.0</td>
<td>119,410.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>13,256.7</td>
<td>14,237.6</td>
<td>16.3</td>
</tr>
<tr>
<td>Kentucky</td>
<td>172</td>
<td>182</td>
<td>94.5</td>
</tr>
</tbody>
</table>

Table 17 provides some summary statistics regarding the Link Sleuth Reporting for each
website. The sites are quite varied in terms of the number of links indexed by the software. The
smallest site had two hyperlinks, and the largest more than 119,000. This provides some
evidence that these websites vary greatly in terms of size and complexity. It should be noted
these links can be internal or external, and some of them may be indexing forms and other
documents to view, download or print. Also evident is most states do a fairly good job
maintaining their links and making sure they are working. The median correct URL percentage is
96.3, meaning that most website administrators stay on top hyperlink maintenance. This is
important in order for the site to look professional and facilitate greater trust from users. There
are a few websites that have a low rate of correct hyperlinks, however. Pennsylvania’s Drivers
and Vehicle Services site has the lowest rate, at 15.1 percent. Only two other sites had fewer than
50 percent of the correct URLS. On the other end of the spectrum, eight web sites had 100
percent correct hyperlinks.

27 The lone exception to this rule was Maryland’s Motor Vehicle Administration web page, which did not process
due to a technical error. However, Maryland’s motor carriers web page was included.
4.3 Web Accessibility Checker
The Web Accessibility Checker provides an analysis of a website’s compliance with Section 508 of the Rehabilitation Act of 1973, which defines accessibility standards for government information technology. The purpose of the legislation is to ensure there were no barriers to use information technology provided by government agencies by individuals with disabilities. The General Services Administration has been responsible for educating affected government and state agencies regarding such requirements as they pertain to “development, procurement, maintenance, or use of electronic and information technology products and services, including software applications and operating systems, web-based internet and intranet information systems, telecommunications products, video and multimedia products, self-contained closed products and desktop and portable computers.”28 State and local government agencies are required to meet such standards if they receive federal funding. In any case, they provide a good standard for all states to meet. A list of the checks performed by the Web Accessibility Checker is available online.29

Figure 6 illustrates the basic distribution of the data. The X axis is the number of known problems, which range from 0 to 43. The mean number of problems is 8.7. The data show an upward skew, which is evidenced by a lower median number of five. This distribution illustrates that the majority of state websites (n=81) have fewer than ten accessibility problems. These problems are resultant of element code errors for text, multimedia, color style sheets,

Figure 6. Frequency Distribution of Web Accessibility Checker Tests

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29 Access the list at: http://achecker.ca/guideline/view_guideline.php?id=2
text-links, client-side image maps, row/column headers for tables, associate data cells, frame titles, applets, accessible forms, navigational links, etc. State websites have done a good job limiting such errors, but this engine provides states with fixes to all Section 508 compliance.

4.4 Hubspot Marketing Grader
The Hubspot Marketing Grader provides information about the marketability of any user-specified website. There are three metrics evaluated by the automated grading process: Top of the Funnel, Middle of the Funnel and Analytics. The first category deals with creating, optimizing and promoting content. Websites get higher scores if the engine finds a blog, the blog is frequently updated, there is an RSS feed, the blog is easy to find, share, and whether updates are posted on Twitter or Facebook. Most of these metrics are based on the marketing research that shows blogs generate more traffic, business leads, and social media presence. The “Middle of the Funnel” category looks at whether states have forms to collect information on visitors, marketing software, the length of time visitors are staying on the site, blog links, subscription offers, social media account links, Twitter mentions, and tweet links to “landing pages” (pages with forms for collecting information). Last is analytics, which determines whether a website administrator has registered the site with an analytics service and the estimated number of unique visitors. This marketing tool is generally aimed at grading business websites and promoting E-commerce, but the applicability to government websites and E-Government is fairly straightforward.

Figure 7. Hubspot Marketing Score Frequency Distribution
The overall Hubspot grade is a composite of these three metrics. The mean of these three numbers is taken and a grade is issued for each website. Figure 7 shows the frequency distribution of the scores. The mean is 56.3, and the median 58. The closeness of these numbers means the data is relatively evenly distributed, as opposed to being largely clustered for a particular range of values like the Web Accessibility Checker data. The lowest score, 11, goes to Nevada’s Department of Motor Vehicles Website. The highest score, 86, goes to both Arizona’s Motor Vehicle Division and Washington’s Commercial Vehicle Services website. Kentucky is ranked 56th, with a score of 52.

4.5 Comprehensive Web Design Score

The W3C Unicorn Validator, Link Sleuth, Web Accessibility Checker and Hubspot Marketing Grader scores were combined to generate a web design score for each state. For each state that has vehicle regulation functions spread across multiple websites, the number was averaged across those sites and used for each measure. As such, the number of measures was reduced from 81 to 49. In order to fairly weight each measure, each score was rescaled between 0 and 1, as a proportion of the maximum score. In order for the measure to work, higher measures must substantively mean a site received a better score. For the W3C Unicorn Validator and Web Accessibility metrics, this meant inverting the scale by taking 1-x for each observation. The W3c Unicorn Validator Score is the mean score for HTML Errors, HTML Warnings, CSS Errors, CSS Warnings, Mobile Errors and Mobile Warnings. Therefore, the W3C scores account for one of four metrics used in the Web Design Score, along with the Web Accessibility Checker, Hubspot Marketing Grader and Link Sleuth link analysis.

Figure 8. State Web Design Index Score
<table>
<thead>
<tr>
<th>State</th>
<th>Web Design Index Score</th>
<th>W3CMean</th>
<th>Link Sleuth</th>
<th>WAC</th>
<th>Hubspot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>0.803</td>
<td>0.876</td>
<td>0.966</td>
<td>0.977</td>
<td>0.395</td>
</tr>
<tr>
<td>Alaska</td>
<td>0.856</td>
<td>0.813</td>
<td>0.914</td>
<td>0.977</td>
<td>0.721</td>
</tr>
<tr>
<td>Arizona</td>
<td>0.827</td>
<td>0.614</td>
<td>0.928</td>
<td>0.767</td>
<td>1.000</td>
</tr>
<tr>
<td>Arkansas</td>
<td>0.699</td>
<td>0.545</td>
<td>0.960</td>
<td>0.690</td>
<td>0.601</td>
</tr>
<tr>
<td>California</td>
<td>0.762</td>
<td>0.633</td>
<td>0.957</td>
<td>0.814</td>
<td>0.645</td>
</tr>
<tr>
<td>Colorado</td>
<td>0.870</td>
<td>0.815</td>
<td>0.969</td>
<td>0.953</td>
<td>0.744</td>
</tr>
<tr>
<td>Connecticut</td>
<td>0.837</td>
<td>0.688</td>
<td>0.976</td>
<td>0.930</td>
<td>0.756</td>
</tr>
<tr>
<td>Delaware</td>
<td>0.732</td>
<td>0.614</td>
<td>0.941</td>
<td>0.698</td>
<td>0.674</td>
</tr>
<tr>
<td>Florida</td>
<td>0.850</td>
<td>0.747</td>
<td>0.980</td>
<td>0.953</td>
<td>0.721</td>
</tr>
<tr>
<td>Georgia</td>
<td>0.763</td>
<td>0.749</td>
<td>0.859</td>
<td>0.752</td>
<td>0.690</td>
</tr>
<tr>
<td>Idaho</td>
<td>0.769</td>
<td>0.762</td>
<td>0.963</td>
<td>0.779</td>
<td>0.570</td>
</tr>
<tr>
<td>Illinois</td>
<td>0.808</td>
<td>0.803</td>
<td>0.948</td>
<td>0.959</td>
<td>0.523</td>
</tr>
<tr>
<td>Indiana</td>
<td>0.766</td>
<td>0.671</td>
<td>0.979</td>
<td>0.616</td>
<td>0.797</td>
</tr>
<tr>
<td>Iowa</td>
<td>0.790</td>
<td>0.775</td>
<td>0.945</td>
<td>0.674</td>
<td>0.767</td>
</tr>
<tr>
<td>Kansas</td>
<td>0.842</td>
<td>0.860</td>
<td>0.961</td>
<td>1.000</td>
<td>0.547</td>
</tr>
<tr>
<td>Kentucky</td>
<td>0.487</td>
<td>0.306</td>
<td>0.945</td>
<td>0.093</td>
<td>0.605</td>
</tr>
<tr>
<td>Louisiana</td>
<td>0.733</td>
<td>0.765</td>
<td>0.880</td>
<td>0.826</td>
<td>0.459</td>
</tr>
<tr>
<td>Maine</td>
<td>0.847</td>
<td>0.763</td>
<td>0.940</td>
<td>1.000</td>
<td>0.686</td>
</tr>
<tr>
<td>Maryland</td>
<td>0.804</td>
<td>0.651</td>
<td>0.997</td>
<td>0.919</td>
<td>0.651</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>0.810</td>
<td>0.772</td>
<td>0.909</td>
<td>0.616</td>
<td>0.942</td>
</tr>
<tr>
<td>Michigan</td>
<td>0.660</td>
<td>0.648</td>
<td>0.401</td>
<td>0.884</td>
<td>0.709</td>
</tr>
<tr>
<td>Minnesota</td>
<td>0.791</td>
<td>0.634</td>
<td>0.956</td>
<td>0.930</td>
<td>0.645</td>
</tr>
<tr>
<td>Mississippi</td>
<td>0.827</td>
<td>0.808</td>
<td>0.942</td>
<td>0.837</td>
<td>0.721</td>
</tr>
<tr>
<td>Missouri</td>
<td>0.743</td>
<td>0.729</td>
<td>0.617</td>
<td>0.802</td>
<td>0.826</td>
</tr>
<tr>
<td>Montana</td>
<td>0.778</td>
<td>0.805</td>
<td>0.915</td>
<td>0.558</td>
<td>0.831</td>
</tr>
<tr>
<td>Nebraska</td>
<td>0.778</td>
<td>0.721</td>
<td>0.986</td>
<td>0.884</td>
<td>0.523</td>
</tr>
<tr>
<td>Nevada</td>
<td>0.771</td>
<td>0.955</td>
<td>1.000</td>
<td>1.000</td>
<td>0.128</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>0.854</td>
<td>0.781</td>
<td>0.973</td>
<td>1.000</td>
<td>0.663</td>
</tr>
<tr>
<td>New Jersey</td>
<td>0.824</td>
<td>0.802</td>
<td>0.958</td>
<td>0.791</td>
<td>0.744</td>
</tr>
<tr>
<td>New Mexico</td>
<td>0.732</td>
<td>0.706</td>
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Figure 8 provides a graphical representation of state web design index scores, and Table 18 provides a detailed breakdown of each state’s scores. The Web Design Index Score is the mean of the W3C Unicorn Validator, Link Sleuth, Web Accessibility Checker and Hubspot scores listed to the right. Higher scores indicate a better performance for each measure. Washington state’s web design index score is the highest of any state at .900. Washington performed near the top for both HTML link maintenance and the marketing score, and did well above average on the W3C and web accessibility metrics. Kentucky garnered the lowest score at 0.487. Low scores for Kentucky were driven by the W3C indicator and Web Accessibility indicator. Kentucky’s Department of Vehicle Regulation Web site had the most HTML warnings, CSS Errors, CSS Warnings and was near the bottom in terms of Web Accessibility problems. South Carolina and Ohio were also states that scored significantly lower on the web design metric than other states. Tracking relationships between states with high levels of web services and web design scores proved difficult. There are examples of states with a high number of web applications and a high score on the web design index (Florida, Washington, Arizona). On the other hand, states like South Dakota and Colorado have few web applications but did well on the web design component. It may be the case that some states with more ambitious vehicle regulation websites are more likely to accrue more programming errors with websites that are more complex than states with simple websites and limited functionality. However, this pattern is not consistent enough to be considered systemic. States with high levels of website functionality (Virginia, Oregon) and low web design index scores cast doubt, as do states with both low functionality and web design scores (South Carolina, Pennsylvania). The correlation between web design scores and number of web services is slightly negative, but not of a large enough magnitude to investigate the relationship much further.
The lack of relationship could owe to the limits of the web design index. For example, the index only touches upon programming, accessibility, maintenance and marketing with limited metrics. The aesthetics, graphic design or user interfaces of each website were not evaluated due to project limitations. Inclusion of such elements may significantly alter the measures. Take for example, New Mexico, a state which scored slightly under average for the total web design index, which won a Digital Government Achievement Award for best Government-to-citizen website in the state government category. The website homepage, shown in Figure 9, is quite aesthetically pleasing, with a Southwestern motif, a clean, modern look, easy-to-navigate menus, and adjustments for font size, and even a Spanish-language version of the site. None of these characteristics were picked up in the quantitative analysis, but few would argue this is not one of the better looking vehicle regulation web sites currently in operation.

Figure 9. New Mexico MVD Portal

There are other extenuating circumstances which may also influence the outcomes, such as glitches with the web applications used to derive the measures, a chance a website was undergoing maintenance or changes at the time of the test, and potentially, the weighting of all websites equally in states where the functions were spread across multiple sites. However, aesthetics and web design tend to be a very subjective measure of web design, whereas there is more agreement about the necessity and propriety of the elements for which the analysis in this chapter set out to probe.

4.6 Chapter Summary

In order to provide a systematic web design evaluation of all states, some quantitative metrics were taken using the W3C’s Unicorn Validator tool to assess the quality of the HTML code, CSS code and mobile compatibility. Xenu Link Sleuth software assessed the maintenance of web site HTML codes, and the Web Accessibility Checker assessed Section 508 accessibility requirements. Hubspot’s Marketing Grader was used to grade each site’s marketing strength. The W3C Unicorn Validator assessed the number of HTML errors, HTML warnings, CSS errors, CSS warnings, mobile errors and mobile warnings for each state’s website or websites. The Xenu Link Sleuth Software analyzed the number of links on each site and the percentage of them which sent users to active pages. The Web Accessibility Checker has provided analysis of a website’s compliance with the Section 508 of the Rehabilitation Act of 1973, which defines accessibility standards for government information technology. The Hubspot Marketing Grader provides information about the marketability of any user-specified website. There are three metrics evaluated by the automated grading process: Top of the Funnel, Middle of the Funnel, and Analytics. The first category deals with creating, optimizing and promoting content. The “Middle of the Funnel” category looks at whether states have forms to collect information on visitors, marketing software, the length of time visitors are staying on the site, blog links, subscription offers, social media account links, Twitter mentions, and tweet links to “landing pages” (pages with forms for collecting information). Last is analytics, which determines whether a website administrator has registered the site with an analytics service and the estimated number of unique visitors.

The W3C Unified Unicorn Validator, Link Sleuth, Web Accessibility Checker and Hubspot Marketing Grader scores were combined to generate a web design score for each state. For each state that has vehicle regulation functions spread across multiple websites, the number was averaged across those sites and used for each measure. Washington received the highest score, followed by North Dakota and North Carolina. Kentucky received the lowest score, along with South Carolina and Ohio. There is a slightly negative correlation between web design scores and the number of total web services a state has, but the association is very slight. Were the relationship stronger, it could signify states with more web application have more complex websites, which in turn could lead to greater errors. However, such a hypothesis is not strongly supported by the data. Kentucky’s Department of Vehicle Regulation should place greater emphasis on W3C standards compliance, Section 508 compliance and marketing approach.
Chapter 5. Implementation Plan and Recommendations

This chapter outlines implementation strategies currently employed by the Office of Information Technology (OIT) in the KYTC for expanding the web application functionality of the state’s vehicle regulation website. OIT organizes projects for the Department of Vehicle Regulation in accordance with the administrative organization of its divisions. As such, some developers work on projects for the Division of Motor Carriers, some for the Division of Vehicle Licensing and others for the Division of Driver Licensing. However, there are also web applications, or particular features of web applications, which apply to all divisions. Those are detailed in a separate section. In sum, the chapter details projects currently under way or slated to begin within the next two years and applications not currently under development that would provide valuable services to Kentucky residents as well as the trucking industry. It also provides suggestions for improving W3C web compliance, link maintenance, Section 508 Compliance, and marketing scores.

5.1 Motor Carriers

OIT is doing extensive work to implement new web applications for motor carriers and develop a new web-based motor carrier portal and a new web-based infrastructure for KYTC officials and law enforcement officials working in commercial vehicle enforcement. This section will details some of the web applications currently under development, projects planned in the near future, and provides some suggestions developers may want to consider as they build these applications.

KYU (Efile/Epay)

The Kentucky Weight-Distance Tax (KYU) is a weight-distance tax program requiring motor carriers operating in Kentucky to file a quarterly weight distance tax return reporting the number of miles operated in Kentucky. About 60,000 of these returns are filed by trucking firms all over the United States and Canada, requiring a large administrative burden, high mailing costs and inconvenience for trucking companies forced to file the quarterly reports.

The KYU tax wizard came online for 2012 Q2 KYU tax return filing. The initial trial was quite successful, with more than 50,000 tax returns filed online. The online filing engine gives users the ability to file taxes electronically and pay online with credit card, debit card or electronic check. There is also an option to calculate the taxes online, print a voucher and mail it in with payment. The online tax filing system requires significantly less time to process returns and saves substantially in terms of mailing costs. The Division of Motor Carriers plans to implement a barcode system for vouchers in order to further improve the processing speed of those returns.

Figure 20 shows a screenshot of the KYU tax wizard. Individuals are asked to enter their KYU number and follow the on-screen steps. The process calculates the tax return for the motor carrier as the user enters the requested information. The application will also contain an inventory update feature, which will allow carriers to add or delete vehicles operating under a particular KYU number. Users with an agreement on file will also be able to apply for a KYU license online once the system is fully implemented.
The International Registration Plan (IRP) was created in 1973 by an Association of Motor Vehicle Administrators (AAMVA) subcommittee consisting of motor vehicle administrators and transportation industry representatives. The primary objective of the committee was to develop a registration plan that would effectively incorporate all of the contiguous American states and Canadian provinces, and specify an apportionment or reciprocity plan agreeable to both the trucking industry and participating jurisdictions. Currently, the 48 contiguous U.S. states, the District of Columbia, and ten Canadian provinces comprise the 59 IRP member jurisdictions.

IRP Web is a role-based application that allows additional functionality based on the Type of User (Internal, External). This Application is a companion to the IRP mainframe application which the DMC staff uses to Manage IRP Functionality.

IRP Web Application Functionality:

- Renew Fleets
- Maintain Vehicles (Add A Vehicle, Transfer Registration, Replace Places, Replace Cab Card, Weight Change, Update Lease/USDOT)
• Add Jurisdictions
• Pending Transaction (Bills, renew Fleet, Vehicle)
• Administrative (Account information, User Profile, View Account uploads, Contact Account users, View all Pending Documents, Maintain all Users)

IRP Web system is designed to allow Motor Carriers the option to process IRP annual fleet renewals and request supplemental products online through self-registration. The renewal process includes adding/deleting vehicles on a fleet, selecting jurisdictions, reporting mileage, and applying alternate weights if the jurisdictions selected by motor carriers support alternate weights. Once the IRP account has been renewed, motor carriers will have the option to replace, change or add supplemental jurisdictions to their IRP account online through a maintain vehicle supplemental process. The options include:

• Replace Cab Cards
• Update Lease Agreement
• Change Weight
• Add Jurisdiction
• Transfer Registration
• Add Vehicle
• Replace Plates

Motor carriers also have access to their account information and user profile; however, they must submit a physical address change request to Division of Motor Carriers if they desire to change this information. Users can view billing history and pending transactions. The IRP web system is designed to allow motor carriers to upload required documentation in support of their requests and the system has a document approval process incorporated. The IRP Web system accepts electronic payments and allows the user to print temporary credentials once the payment process is complete.

The entire fleet would be renewed at the end of the Motor Carrier’s registration year. At that time, a motor carrier can add or delete a vehicle from inventory. Also, during the renewal period, motor carriers can add a vehicle to their inventory through the maintain vehicle process mentioned above.

**KIT (Efile/Epay)**
A Kentucky Intrastate Tax (KIT) license is required for intrastate carriers with a gross registered weight exceeding 26,000 lbs. or vehicles with three or more axles regardless of weight to report fuel use tax. According to Transportation Cabinet records, there were 3,580 active KIT license holders in Kentucky as of February 2012. Motor carriers pay surtax on the amount of gasoline and special fuels used in operation on public highways throughout the state, which in the case of intrastate carriers is a relatively straightforward calculation. The carrier logs the number of miles logged by each power unit in its fleet and divides that number by its average miles per gallon in order to determine the amount of fuel consumed. The gallons of fuel are then multiplied by the surtax rate established by the Kentucky Department of Revenue based on the criteria set forth in
KRS 138.660. The OIT is currently developing a new Efile/Epay web application for KIT, which would allow users to gather the tax information, file in a database for latter retrieval, and allow Epay using a credit card or debit card. A voucher option, which allows users to print the returns and mail in the voucher with payment within ten days, is also available. The current version is a tax wizard that allows users to fill in, print and mail tax information to the KYTC for processing.

**Temporary Web Permits**

OIT, Kentucky Interactive (KI), the Commonwealth Office of Technology (COT) and ITERIS are partnering to develop an online web application for the issuance of Temporary Permits. KI is working on the front end, OIT is working on storage of the data in KTEAM, ITERIS is working on screening of Permits in real time, and COT will be working on adding KYU inventory through a permit. This project is still in early stages with no concrete date of completion.

Eventually, KYU, IFTA, KIT, IRP < 55,000, IRP > 55,000, ADD to KYU Inventory, and combinations of these permits will be issuable through the new system. However, this system is slated to be internal to the Division of Motor Carriers. No external customer signup is proposed for this web application.

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**Recommended Enhancement: Online Permit Issuance**

States issue a variety of commercial vehicle permits, and many have begun offering permits online. In Arizona, users with a registered EZ Pay account may purchase a variety of trucking permits. Once the electronic application is completed and payment is tendered, a confirmation screen is displayed. An officer then reviews the application and sends the permit to the user via e-mail. Arizona sells oversize permits and trip permits online. After the users select the permit they wish to obtain (see Figure 14 below), they are prompted to enter company name, USDOT#, insurance company, contact, contact phone, IFTA#, IRP#, and a valid e-mail address. The Division of Motor Carriers could use such a system in order to issue a number of permits, including overweight permits, trip permits, temporary registration, hazmat endorsements, etc.

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**Figure 14. Screenshot of Arizona's Commercial Vehicle Permits System**

![Screenshot of Arizona's Commercial Vehicle Permits System](image-url)
**OW/OD Permits**

The Bentley Oversize/Overweight System is a standalone system for issuance of oversize-overweight permits, both trip permits and annual permits. The system interacts with both the KY CVIEW and its Legacy permitting system. The Bentley system features an automated routing system. ITERIS is currently determining the requirements necessary to develop an OS/OW permitting system that pushes updates to the new Super CVIEW. Currently these permits cannot be purchased and issued online. Web applicants for permits must have an agreement on file with the Division of Motor Carriers authorizing the ACH debit of their bank accounts for any permits issued to them or their companies. No credit cards will be accepted for payment of Web based permits.

**Extended Weight Decal**

OIT is developing an Extended Weight Coal Haul Decal (EWD) system which allows for the creation of Extended Weight Decals. These decals are purchased by operators hauling coal in excess of 80,000 lbs on the Coal Haul Highway System.

**Account Management System**

OIT is developing a password management system for DMC-related web applications which will allow those using the online web applications to sign in using a single user name and password. The single sign in system will streamline the sign-in process and allow centralized management of basic user information. This would streamline the current process, which requires users to sign in with a distinct user name and password for every web application. No completion date has been set. The Motor Carrier Services that are currently provided require self-registration. This Functionality is by account (KIT, KYU, IRP, or IFTA,) so the user that is working on the account may be a different user. In the future there would be a single sign in function where users would not have to sign in multiple times to work on different accounts. The system will display mailing address, physical address, USDOT#, phone number, fax number, e-mail provider (not address), and a button to display vehicle inventory for KYU (Kentucky Weight Distance Tax) holders. The current plans for the application feature prominently in the development of several applications for the Division of Motor Carriers; however, the account management system could be synchronized for all divisions. For example, it would be possible for the owner of a trucking company to renew all fleet licenses and credentials, as well as personal driver’s licenses and vehicle licenses under the same account.
Virtually all states have some sort of account management system for residents who perform online transactions. Typically, these applications will gather basic identifying information such as name, address, phone number and e-mail. Some also store financial information. Maryland’s system is an exemplar because of the way it links online vehicle services and driver services, allows for quick processing through the FastTrack System, and uses shopping cart technology to allow individuals to purchase several credentials from the website simultaneously (see Figure 10). Users must provide a driver’s license number and date of birth in order to use the system. The system also allows users to change their mailing address, manage their account, provide contact information to the state in case of emergency, and manage their PIN number, which is used to provide account security.

Super CVIEW

Currently, Kentucky’s CVIEW provides data to various databases for screening of both commercial vehicles in a roadside application and screening of companies prior to licensing and credentialing actions. The development of a Super CVIEW will allow Kentucky to screen both of these functions directly against the Kentucky CVIEW.

Currently Kentucky screens motor carriers at deskside and roadside through a myriad of screening databases. Those databases include the KY Clearinghouse, the PRISM target file, standalone license plate and DOT readers, and ModelMACS (transponders). Each of these systems, all written in different programming languages and residing on different platforms, require excessive information technology resources.

Using a single point of contact to screen all commercial vehicle transactions through the KY CVIEW will eliminate the need for elaborate coordination of IT personnel to make updates or changes to the existing system architecture by consolidating maintenance to a single database.
Kentucky can ensure all transactions are screened against the same data and that the data is updated in real time.

This web application will not be used by the public, but will be utilized by individuals working for the KYTC, Commercial Vehicle Enforcement and Kentucky State Police at weigh stations and mobile sites around the state.

**Web-based Motor Carrier Portal**

Kentucky’s Division of Motor Carriers is responsible for IRP, IFTA, UCR, KIT, KYU, Operating Authority, Oversize/Overweight Permitting, Trip Permitting, and Extended Weight Decals. Currently, the systems that run these programs are either standalone Oracle or mainframe systems. Kentucky is in the process of building a single web-based module system that will incorporate all of these components for use by state employees as well as motor carriers. These modules will be implemented individually as analysis and development moves forward in each area.

Analysis and development of the IRP web module within the Motor Carrier Portal is almost complete. Analysis for all other modules is under way, and the OIT is working with ITERIS to develop an implementation plan.

As these new systems are brought online, they will interact with the state’s Electronic Management, Administrative and Reporting System (eMARS) to provide better tracking and accountability. All electronic payments will be coordinated with the Kentucky Interactive payment process which will allow motor carrier customers to pay on-line with a credit/debit card, ACH or EFT.

This architecture will make it easier to provide web-based services for these programs to motor carriers in the state or to out-of-state carriers with routes through or to Kentucky.

**Other Applications in Development**

- Solid Waste
- Credentials
- License Issuance (Bus, KYU, Limousine, Taxicab, etc)
- Bonds
- Audits
- Customer Service Desk
- Account Payment Management

**5.2 Driver Licensing**

Online Kentucky Driver’s License Practice Exam/Smart Phone Application

This web and smart phone application have both been developed since the initial survey of Kentucky’s DVR web capabilities. When applying for a Driver's Permit, applicants are given a
written knowledge test containing questions regarding driving rules, regulations, procedures, and highway signs. The answers to all questions on the test are in the Kentucky Drivers Manual. Applicants must make a minimum score of 80 percent to pass this test. Online tests and smartphone applications with the test were developed in order to give individuals enhanced opportunity to practice for the test, and hopefully increase the success rate of those taking the written exam for the first time. Figure 13 displays screenshots of the Drive License Practice Test for the iPhone.

Figure 13. Screenshots of Kentucky's Driver License Practice Test Smartphone Application

No Pass No Drive Application

This is an application particular to school districts. Passed during the 2007 legislative session, it affects every public and private school in Kentucky (including home school students). The law says that schools will use academic and attendance data from the previous semester of the current school year to determine whether 16 and 17-year-old students are compliant with the law. If deemed noncompliant, the student’s driver’s license is revoked (this process occurs on a web portal that directly connects schools and the Kentucky Department of Transportation). In the case of a first time application for a learning permit, the paper form required to apply for the permit will not be completed and issued by the school. If the student is compliant for an entire semester, then the permit or license can be reinstated.
Online driver’s license or personal ID renewals are growing in popularity, although there are some logistical issues with online driver’s license issuance. One problem is the photo component of the ID, which cannot be updated if the individual is not going to the local or regional driver’s licensing branch. Most states deal with this issue by capping the number of consecutive times a license or ID can be renewed online. Maine, for example, requires an eye exam after the age of 40 and every other renewal after that. For those renewals, an in-office visit is necessary in Maine. Other restrictions may also apply. California prohibits renewals for individuals who have changed addresses or have expired licenses. Florida provides a driver’s license status checker for motorists wishing to renew online to see if they qualify for such a renewal, or whether those individuals will have to renew via mail or in-office visit. Maine extends the restrictions to CDLs, lack of proof of legal residence, change in weight or hair color, new medical condition, change of name, or a suspended or revoked license. Length of renewal also varies by state, with Maine offering four and six year renewals, Colorado offering five year renewals, and in California the license is valid for five years. Some states, such as Virginia, allow eight year renewals.

Figure 19 displays a screenshot Colorado’s Online Driver’s License & ID Card Renewal System. Users are prompted to enter a driver’s license or ID number, date of birth and the last four digits of their social security number in order to identify them and pull up the relevant information in
the database. The eligibility requirements, help, price, feedback, forms of payment and implications of online renewal are spelled out or linked in the screenshot above.

5.3 Vehicle Licensing

KAVIS

KAVIS stands for Kentucky Automated Vehicle Information System. KAVIS will provide the Commonwealth with a flexible, customer-centered information system for vehicle and boat titling, registration, and financial management. The KAVIS comprehensive solution will replace our legacy systems – the Automated Vehicle Information System (AVIS) and the Boat Titling and Registration System (BTR).

The earliest KAVIS go-live date was expected to be August 2012. The revised earliest go-live date is the second quarter of 2013. One reason for this change is a request from the Kentucky County Clerk Association (KCCA) that the go-live date not be scheduled between the 2012 primary (May) and general election (November) cycles.

Another reason for the revised go-live date is the level of change request activity on the project. Change request on the KAVIS project have been issued to either add functionality to meet existing Commonwealth statutes, replace existing AVIS functionality or to support business processes. KYTC KAVIS team members and 3M have analyzed existing pending change requests and determined that additional time will be required to build the changes into the system. Every change that is made to the system will be thoroughly tested.

KAVIS will have several components that enhance the services the KYTC is able to provide people with vehicles registered in Kentucky. The following services will interface with KAVIS, thereby improving vehicle information services:

- Address Validation/Tax District Web Service
- Extended Weight Decal (EWD)
- IRP
- SSN/DLN Web Service
- Customer Inquiry Web service
- Vehicle Inquiry Web Service
- Lien Inquiry Web Service
- Warehouse Reporting Web services
- LINK (Kentucky State Police)
- UNI (Unified Network Interface) AAMVA
- Online web renewal (AVIS)

Recommended Application: Specialty/Personalized Plates

Currently, Kentucky displays all of its specialty plates online, although personalized (or vanity) plates are not displayable. According to the catalogue of web applications, 21 states offer
specialty plates ordering online, and 16 states offer online purchases of personalized plates. Several other states allow one to browse specialty plates or perform queries for plates to see if particular combinations of letters and numbers have already been taken. Each state’s application design is slightly different in terms of how the orders are processed, the graphics are displayed, etc. Graphically speaking, the Pick-a-Plate application developed by the Illinois Secretary of State’s office is probably the most compelling example of a personalized or specialty plate web application that allows online transactions. It allows individuals to buy custom plates, for cars, trucks, SUVs, vans, motorcycles, motor homes, trailers, and vintage cars, as well as disability plates. Figure 18 is a screenshot of the Pick-a-Plate system.

Figure 15. Screenshot of Illinois' Pick-a-Plate Web Application

It is powered by Adobe Flash, which is visually very appealing; however, there are compatibility issues with Flash and some devices. The graphical user interface is very straightforward, making use of icons and graphics in order to streamline the plate ordering process. The application tells the user the cost of procuring various kinds of specialty or personalized plates, shows a graphical representation of the plate, and allows users to type in a combination of letters and numbers on the plate graphic to get an idea of how it would look. The application then performs a web search to determine whether a particular combination of plates and numbers is available. If it is, users continue to the next screen where they are asked to report information off of their previous vehicle registration document in order to process the order and take payment.
5.4 Department of Vehicle Regulation Web Applications

**Recommended Application: Service Reminder**

This application is a simple reminder to users that a particular credential or license is due for renewal. Massachusetts provides this service via its Registry of Motor Vehicles website (see Figure 11), which allows users to set up reminders to renew a driver’s license or ID. The reminder is actually delivered through Sendza, an outside marketing company. Sendza does not receive any personal information from the state government, but does receive coded information which allows its system to notify individuals by phone, e-mail or text message. Theoretically, such an application could be modified to provide reminders for a variety of services. Online services housed by Vehicle Licensing, Motor Carriers, and eventually Driver Licensing (assuming online renewal is developed) could make use of such an application for a variety of services. Perhaps the timing and frequency of the reminders could also be specified by users to provide maximum benefit.

**Figure 16. Screenshot of Massachusetts’ RMV Service Reminder Application**

**Recommended Application: Live Help**

Colorado has a Live Help application that allows users to chat with an online representative, Monday-Friday from 8 AM to 5 PM. Users that go to the Live Help page are prompted to enter a name, e-mail address and question. After completion of those data fields, the users then hit a “Request Chat” radio button and is connected with a customer service representative, who can answer any questions about errors on the website and assist with technical difficulties. This application is available at the state’s web portal, colorado.gov. As such, there are limitations to the types of questions that can be answered by online customer service associates.

However, such an application could be developed with DVR-specific assistance in mind. Employees at the KYTC’s Customer Service Center, which currently takes calls from county clerks or customers with questions about Motor Vehicle Licensing, Driver’s Licensing and Motor Carriers issues. Some of those individuals could be trained to handle similar requests from online customers. Waiting for an answer in an online chat is oftentimes preferable to holding over the phone, particularly for younger and more tech-savvy customers. The scope of usage would have to be defined prior to implementation. More complex cases will still likely require phone or in-person contact, but many of the simpler issues can be resolved via quick online chats.
Figure 17. Screenshot of Colorado’s Live Help Application

Smartphone Applications

Smartphone and tablet applications sales and use have grown rapidly for the last several years. According to a recent research report, the global number of smart phone application users will reach nearly 1 billion globally by the end of 2013, and sales revenue from the sale of phone and tablet applications is projected to increase from $1.94 billion (2009) to $15.65 billion (2013). According to a separate report by the Pew Research Center, 35 percent of all adults own a smartphone, and the number is even higher for those under age 45. The study shows 58 percent of Americans between 25 and 34 own smartphones, as do 49 percent of those between 18 and 24, and 44 percent of those between ages 35 and 44. Even more importantly, about one quarter of smartphone users do most of their online browsing on their smartphone. As such, it will become increasingly important for businesses and governments to allow transacting through the development of smart phone applications. Kentucky’s Department of Vehicle Regulation has initiated development of the smartphone application for driver’s license practice tests. However, such applications have nearly endless possibilities in terms of the tasks which can be conducted through them. As they become more developed, it will become easier to implement greater numbers of fee-based transactions as well.

5.5 Web Design Standards Improvements

It is recommended that OIT review the reports generated by the W3C Unicorn Unified Validator, Xenu Link Sleuth, Web Accessibility Checker and Hubspot Marketing Grader, and implement the changes recommended.

W3C Unicorn Unified Validator

32 Smith, Aaron. 7 July 2011. “35% of American adults own a smartphone.”
The W3C Unicorn Unified Validator provides a report detailing the errors and correction necessary in order to obtain compliance with existing standards. The report notes several HTML, CSS and mobile programming errors and warnings that could be detrimental to website functionality.\(^3^3\)

**Xenu Link Sleuth**

The Xenu Link Sleuth also generates a report detailing all of the links indexed for a website, which links work, and which links non-responsive. The report also includes descriptive statistics about the number and types of links, along with descriptive statistics for the site indexed. The program could be downloaded and run periodically to ensure all links are functioning as desired.\(^3^4\)

**Web Accessibility Checker**

The Web Accessibility Checker has several capabilities, but the report generated for this study centers on Section 508 compliance and known issues with those federally mandated standards. Fixes for those problems are detailed in the generated report.\(^3^5\)

**Hubspot Marketing Grader**

The Hubspot Marketing Grader provides feedback on the website’s marketing capabilities and what can be done to increase the reach of the organization. The Hubspot report makes several recommendations, among them:\(^3^6\)

1. Create a blog for your organization.
2. Tweet more frequently.
3. Post to the organization Facebook page more frequently.
4. Share links to landing pages with forms on Twitter.
5. Share links to landing pages with forms on Facebook.
6. Reply to individuals on Twitter to be more conversational.

**5.6 Digital States Survey**

The Digital States Survey, which is conducted biannually by the Center for Digital Government, provides grades for all state government digital services. The scope of such a study extends

\(^3^3\) The report for the Kentucky DVR site (which is technically the Motor Carriers home page) has been made available to OIT officials, and can be obtained by running the tool at: [http://validator.w3.org/unicorn/](http://validator.w3.org/unicorn/)

\(^3^4\) The report for the Kentucky DVR has been made available to OIT officials and may be run after downloading the software at: [http://download.cnet.com/Xenu-s-Link-Sleuth/3000-10248_4-10020826.html](http://download.cnet.com/Xenu-s-Link-Sleuth/3000-10248_4-10020826.html)

\(^3^5\) The report for the Kentucky DVR site has been made available to OIT officials, and can be accessed by running the tool at: [http://achecker.ca/checker/index.php](http://achecker.ca/checker/index.php)

\(^3^6\) The report for the Kentucky DVR site has been made available to OIT officials, and can be accessed by running the tool at: [http://marketing.grader.com/](http://marketing.grader.com/)
beyond a single department, cabinet or division and looks at the overall state performance. Grades were given based on streamlined operations and quantifiable results in better serving residents. Based on feedback received from the states, grades are assigned and awards given to those states which demonstrate results in eight areas, including citizen engagement and open government, administration and human resource management, and adaptive leadership and innovation. For the 2010 edition of the survey, Kentucky received a B+ on its state report card, which according to the study, means the state is “trending up. Demonstrated results in many categories. Leadership using modernization to change entrenched practices to prepare for more sustainable operations. Incentives for collaboration in place. Measures used in key areas. Cuts tend to be made across the board.”

Best Practices awards were made from Enterprise IT, Open Government, Finance and Administration, Health and Human Services, Energy and Transportation, Commerce, Labor and Tax, and Public Safety areas. Some examples:

**Enterprise IT**
- California consolidated IT office space for five agencies to one building; added high-speed Wi-Fi internet to more than 100 libraries using a grant from the Bill and Melinda Gates Foundation, and implemented a statewide e-mail system.

- Illinois reduced the number of computing centers/rooms/space by moving some servers and mainframes, decommissioning others and installing virtual servers. This has saved the state $10.7 million in net savings between July 2006 and May 2010.

**Open Government**
- California launched the nation’s first mobile portable for online government. According to state officials, unique visitors to state websites, due in large part to the new portal, are up 1,500 percent. The state also created an application development tool kit, which allows various state agencies to build and launch new state vehicle applications quickly. The portal site has detection software which routes mobile users to the mobile version of the portal.

- Colorado has an interactive feature called Tax Tracks, which allows users to access detailed information about how state tax dollars are used. Based on user-entered incomes, the feature will estimate how much of their tax income is spent on particular tax services. The application contains tax spending information for nearly 100 different government functions. The state also implemented an online campaign finance system, which allows citizens to access financial data and create reports online.

**Finance and Administration**
- Kansas Revenue and Labor departments implemented a website which allows individuals to report worker misclassification, when employers classify workers as employees.

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38 Ibid.
instead of independent contractors. The site allows electronic sharing of information and enables the agencies to step up enforcement efforts.

- New York developed an automated timecard system, which allows employees in 53 state agencies to track work time and the accrual of vacation/sick leave. The site was developed in order to help ensure compliance with union and collective bargaining rules.

**Health and Human Services**

- Maryland has developed a web-based surveillance system to track the outbreak of diseases and illness patterns in order to identify public health emergencies and provide public health agencies with the information needed to control such outbreaks. As of 2010, the site serviced 75 hospitals.

- Two new computer systems in Michigan allow state officials to make eligibility determinations for all federally subsidized human services programs and process Medicaid payments in a timelier manner. The system responsible for the former is known as BRIDGES, and the latter system is known as CHAMPS. These systems have increased participation rates among those eligible for benefits and increased the number of Medicaid accounts that can be hired by a claims adjuster.

**Energy and Transportation**

- 511NY provides users with automated traffic and travel feeds via e-alerts and social media such as Twitter, Facebook, Flickr and YouTube. The real-time information is available in one place. Another site was built by the Office of General Services to provide the effectiveness of green cleaning products. The CIO/Office for Technology applied an Energy Star power setting to all desktop computers, requiring the monitors to power down after 15 minutes and the computer to hibernate after 30 minutes.

- The Utah Division of Fish and Wild Life implemented an online system for purchasing hunting and fishing licenses. All such purchases in Utah are now done online. The state has worked with companies such as eBay to help them build more efficient data centers in the state. The state made a database of geothermal wells and springs, available online to the public.

**Commerce, Labor and Tax**

- Michigan, long saddled with the highest unemployment rate in the United States, developed an online system for registration, certification, benefit tracking, changes and responses to claim questions in addition to expanding its call center. The state also launched a website, called Unemployment Insurance Tube, which helped individuals understand aspects of unemployment insurance.

- Missouri has implemented Adobe Connect, which has enabled the Department of Revenue to conduct training online for staff in remote locations. The state entered a public-private partnership with Microsoft, called Elevate America. It allows individuals to claim online skill development and training vouchers. The DOR implemented a new
tax software and hardware system with two third-party vendors, and has generated $109 million for Missouri as of 2010.

Public Safety

- North Dakota has implemented a system that provides crime victims with information about events related to their case and the status of the offender. The system, known as the Statewide Automated Victim Information Network, allows for timely dissemination of information throughout a largely rural state lacking the staff necessary to contact all victims in a timely manner. The system is web-based but also has an interactive voice response (IVR) feature. Victims can be notified online, through e-mail or automated phone message.

- Tennessee developed an Integrated Criminal Justice Web Portal, which provides justice and law enforcement officials with access to a variety of records, including background checks, current location of probationers and parolees, driver history records and vehicle registration records. Prior to the implementation of this system, individuals had to make phone calls, requests, and send e-mails or faxes, spending a significant amount of time chasing down such information. As of 2010 there are 150 agencies using it, but Tennessee has plans for expanding availability.

These awards are given every two years for states who innovate in various categories of E-Government development. Not all of them are directly applicable to transportation, yet the ideas provide some ideas and insight regarding the activities of other states in this area of development.

5.7 Chapter Summary

The KYTC’s Office of Information Technology is developing several new applications for the Department of Vehicle Regulation and its constituent divisions. The applications in development are listed in Table 19. Those which are not in development, but are recommended options as a result of this study, are * in the table. The “DIV” column denotes the relevant division. The third column lists C-G for “citizen-to-government” applications and G-G for “government-to-government” applications. Applications used to facilitate the electronic exchange of information, money and services between the public and government agencies are known as “citizen-to-government” applications (C-G), and applications used to facilitate the same types of exchanges between two government entities are known as “government-to-government” applications. The “Status” column denotes the planned completion date, where relevant, and the “Notes” column provides relevant information about each application. These applications and recommendations are described in detail in Chapter 5.

Since the original 49-state study of state vehicle regulation web applications, the OIT has implemented or plans to implement KYU (Efile/Epay), IRP Web, KIT (Efile/Epay), Temporary Permits, OS/OW, EWD, Account Mgmt System, Super CVIEW, Motor Carrier Portal, DL Practice Test, No Pass No Drive and several KAVIS-related applications. Some of the applications are not citizen-to-government applications, which were the exclusive focus of the
applications studied in Chapter 2. Some are government-to-government, which means they facilitate the electronic exchange of information between two government agencies or entities. Several additions, expansions or enhancements of web applications are recommended. New and expanded applications include DL/Personal ID Renewal, Specialty/Personal Plates, Service Reminder, Live Help and Smartphone Applications. Enhancements to the temporary trucking permits and account management system were also recommended.
Table 19. Web Application Development Schedule and Recommended Applications, Enhancements

<table>
<thead>
<tr>
<th>Application</th>
<th>DIV</th>
<th>C-G/G-G</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>KYU (Efile/Epay)</td>
<td>DMC</td>
<td>C-G</td>
<td>Complete</td>
<td>Voucher system changes to come; implemented after 49-state survey</td>
</tr>
<tr>
<td>IRP Web</td>
<td>DMC</td>
<td>C-G</td>
<td>Sep-12</td>
<td>Will allow fleet renewals like the Arizona EZ fleet system</td>
</tr>
<tr>
<td>KIT (Efile/Epay)</td>
<td>DMC</td>
<td>C-G</td>
<td>Sep-12</td>
<td>Replaces current KIT tax wizard</td>
</tr>
<tr>
<td>Temporary Permits</td>
<td>DMC</td>
<td>G-G</td>
<td>Oct-12</td>
<td>Recommended enhancement: Direct online purchases</td>
</tr>
<tr>
<td>OW/OD</td>
<td>DMC</td>
<td>G-G</td>
<td>Nov-12</td>
<td>Part of Super CVIEW</td>
</tr>
<tr>
<td>EWD</td>
<td>DMC</td>
<td>G-G</td>
<td>2013</td>
<td></td>
</tr>
<tr>
<td>Account Mgmt System</td>
<td>DMC</td>
<td>G-G</td>
<td>2013</td>
<td>Recommended enhancement: Expand for all divisions</td>
</tr>
<tr>
<td>Super CVIEW</td>
<td>DMC</td>
<td>C-G/G-G</td>
<td>2013</td>
<td>Architecture includes several credentialing and licensing systems</td>
</tr>
<tr>
<td>Motor Carrier Portal</td>
<td>DMC</td>
<td>G-G</td>
<td>2013</td>
<td>Part of Super CVIEW</td>
</tr>
<tr>
<td>Solid Waste</td>
<td>DMC</td>
<td>G-G</td>
<td>2013</td>
<td>Part of Motor Carrier Portal</td>
</tr>
<tr>
<td>Credentials</td>
<td>DMC</td>
<td>C-G</td>
<td>2013</td>
<td>Insurance, P&amp;HG, ICC, 4Hire, Decal Processing, Rented Trailer, Drive Away, Passenger Type,</td>
</tr>
<tr>
<td>License Issuance</td>
<td>DMC</td>
<td>C-G</td>
<td>2014</td>
<td>Includes Bus, KYU, Limousine, Taxicab, etc</td>
</tr>
<tr>
<td>Bonds</td>
<td>DMC</td>
<td>C-G</td>
<td>2014</td>
<td>Part of Motor Carrier Portal</td>
</tr>
<tr>
<td>Audits</td>
<td>DMC</td>
<td>G-G</td>
<td>2014</td>
<td>Tools to do Reports, Queries, Notification Letters, Generate Bills</td>
</tr>
<tr>
<td>Customer Service Desk</td>
<td>DMC</td>
<td>G-G</td>
<td>2015</td>
<td>For DMC staff, One Stop Shop</td>
</tr>
<tr>
<td>Account Payment Management</td>
<td>DMC</td>
<td>G-G</td>
<td>2015</td>
<td>Internal payment management system upgrades</td>
</tr>
<tr>
<td>DL Practice Test</td>
<td>DL</td>
<td>C-G</td>
<td>Complete</td>
<td>Smart Phone application for practice driver’s license test</td>
</tr>
<tr>
<td>No Pass No Drive</td>
<td>DL</td>
<td>G-G</td>
<td>Complete</td>
<td>Applications allow schools and Division of Driver Licensing to exchange information</td>
</tr>
<tr>
<td>*DL/Personal ID Renewal</td>
<td>DL</td>
<td>C-G</td>
<td>Suggested</td>
<td>KAVIS currently does not allow full online renewal</td>
</tr>
<tr>
<td>KAVIS</td>
<td>VL</td>
<td>C-G/G-G</td>
<td>2Q 2013</td>
<td>Suite of Applications (see write-up)</td>
</tr>
<tr>
<td>*Specialty/Personal Plates</td>
<td>VL</td>
<td>C-G</td>
<td>Suggested</td>
<td>Allow online purchases instead of browsing only</td>
</tr>
<tr>
<td>*Service Reminder</td>
<td>DVR</td>
<td>C-G</td>
<td>Suggested</td>
<td>Some services currently send printed reminds, not electronic</td>
</tr>
<tr>
<td>*Live Help</td>
<td>DVR</td>
<td>C-G</td>
<td>Suggested</td>
<td>Could be tied into the new call center</td>
</tr>
<tr>
<td>*Smartphone Apps</td>
<td>DVR</td>
<td>C-G</td>
<td>Suggested</td>
<td>Expand on DL Practice Test app, develop comprehensive plan</td>
</tr>
<tr>
<td>*= recommended application</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *= recommended application
The implementation plan also recommends the OIT review the reports from the W3C Unicorn Unified Validator, Xenu Link Sleuth, and Web Accessibility Checker to examine errors, warnings, broken links and known problems with Section 508 compliance. In accordance with the Hubspot Marketing Grader report, it is recommended the state create a comprehensive marketing plan for the Department of Vehicle Regulation, perhaps as a component of a comprehensive KYTC marketing plan. The recommendations from the Hubspot analysis indicate a greater need to make use of blogs, social media and the agency’s ability to collect data from residents in order to facilitate better communication with Kentucky residents.

The Digital States Survey, which is conducted biannually by the Center for Digital Government, provides grades for all state government digital services. The scope of such a study extends beyond a single department, cabinet or division and looks at the overall state performance. Grades were given based on streamlined operations and quantifiable results in better serving residents. Based on feedback received from the states, grades are assigned and awards given to those states which demonstrate results in eight areas, including citizen engagement and open government, administration and human resource management, and adaptive leadership and innovation. For the 2010 edition of the survey, Kentucky received a B+ on its state report card, which according to the study, means the state is “[t]rending up. Demonstrated results in many categories. Leadership using modernization to change entrenched practices to prepare for more sustainable operations. Incentives for collaboration in place. Measures used in key areas. Cuts tend to be made across the board.”

The Digital States Survey’s energy and transportation category, which has the most direct applicability to the DVR, provides two examples of states with programs the survey has determined to be effective:

- New York: 511NY provides users with automated traffic and travel feeds via e-alerts and social media such as Twitter, Facebook, Flickr and YouTube. The real-time information is available in one place. Another site was built by the Office of General Services to provide the effectiveness of green cleaning products. The CIO/Office for Technology applied an Energy Star power setting to all desktop computers, requiring the monitors to power down after 15 minutes and the computer to hibernate after 30 minutes.

- Utah: Division of Fish and Wild Life implemented an online system for purchasing hunting and fishing licenses. All such purchases in Utah are now done online. The state has worked with companies such as eBay to help them build more efficient data centers in the state. The state made a database of geothermal wells and springs available online to the public.

Appendix A. Survey of State Web Services

Hello,

My name is Andrew Martin, and I work at the Kentucky Transportation Center. I am researching online internet practices of state vehicle regulation agencies on behalf of the Kentucky Department of Vehicle Regulation (DVR). Particularly, I am interested in information regarding motor vehicle licensing, driver licensing and motor carriers. The DVR is looking to improve its online internet services and practices. Specifically, I’m looking for information concerning Web site usage.

Any data you may have regarding the following would be useful:

1. The number of Web site visitors (or unique Web site visitors) each year for the last five years.

2. The number of annual online transactions performed online each year; if available, the number of transactions performed for each online service you offer.

3. The amount of revenue generated from online transactions per year.

4. The percentage of department business (in terms of either transactions and/or revenue) conducted online vs. more traditional methods (walk-ins/phone/mail) in the last five years.

5. Which credit cards you accept for online payments, and whether there are any associated convenience fees or transaction fees.

6. Whether you take any payments other than credit cards (such as ACH or electronic check).

7. Any estimates you may have about the amount of money saved using online transactions.

8. Do you make use of any particular Web design consultants and/or software the Kentucky DVR might find useful?
Appendix B. State Service Descriptions

Abandoned Vehicle Information

Online service for businesses involved in the sale of abandoned motor vehicles. The service allows businesses to determine the current title holder and whether there are any outstanding liens on the vehicle (Alabama).

Accident Reports

This application allows drivers or witnesses to report motor vehicle accidents electronically. In Arkansas, the report form specifies a minimum of $1000 in property damage, bodily injury or death as a prerequisite to file a report. The form allows individuals to input information about the vehicles involved, license information, insurance information, the nature/amount of damage to vehicles involved and the names of individuals injured or killed (Arkansas).

Florida’s website allows residents to obtain crash reports filed by state troopers in real time.

Oregon allows online submission of motor carrier accident reports.

Account/Password/Pin Management

In virtually all states there is some form of account setup online, via use of a PIN management or account/password system when individuals sign up for online services to ensure no fraudulent online activity takes place (Maryland).

Administrative (Late) Fees

In Maryland, the Motor Vehicle Administration is required to assess an administrative fee of $30 when a vehicle record is flagged for non-payment of a traffic citation, parking ticket or toll violation (Maryland).

Administrative Hearing Request

Residents charged with a DUI may submit an online request for an administrative hearing on the matter (Delaware, Washington).

Auto Body Shop Survey

Per NRS 487, a body shop licensed in this State must complete an on-line survey within 60 days immediately preceding the date of the submission of the application for renewal of the license to the body shop (Nevada).

Auto Lien Holder Registration
Allows lien holders to complete and submit motor security interests (or liens) electronically (Rhode Island).

**Auto Theft Protection Program Enrollment**

H.E.A.T. is a statewide vehicle registration program administered by the Texas Department of Public Safety that helps law enforcement officials identify stolen vehicles (Texas).

**Automobile Complaint Form**

Online form allows individuals to file online complaints regarding automobile use, automobile sales and automobile repairs of state businesses (Michigan).

**Automobile Rental Surcharge Tax**

This is a tax levied on businesses using rented vehicles. In Tennessee, the tax can be paid online (Tennessee).

**Business License Records**

Online access allows individuals to check the occupational license status of a number of businesses within the state. In California, residents may check the occupational license status of the following business categories:

- ATV School
- Dismantler
- Distributor
- Driving School
- Lessor-Retailer
- Manufacturer
- Mature Driver Program
- Registration Services
- Remanufacturer
- Traffic Violator School
- Transporter
- Vehicle Dealer (including Autobroker)
- Vessel Agent

(California)

**Business/Professional Licensing**

Individuals can file business license applications, renew business licenses and/or renew professional licenses (Washington, Nevada).

*Mechanic License Renewal*
In Michigan, licensed auto mechanics may renew their licenses online within 60 days of the current license expiration data.

Renew DMV-issued business certificates for automobile dealers, inspection stations, repair shops and other auto-related facilities.

Site feature allows auto repair facilities to renew business license within 60 days of current license expiration (Michigan).

**Campaign Finance/Lobbying Data**

Campaign finance/lobbying information are. Campaign finance pages contain campaign finance reports for candidates, parties and political action committees (PACs). Lobbying information contains information about lobbyists, clients and entity reports. Some states allow electronic reporting of campaign finance and lobbying information. Typically, this data is only available in instances where the department of state administers or oversees vehicle regulation or vehicle regulation agencies (Illinois, Michigan).

**Change of Address**

This service allows individuals to update their current address on vehicle registration records online (Alaska).

**Commercial Driver Alcohol and Drug Testing Database**

This database contains drug test results for individuals employed or applying to work as truck drivers in a particular state. In Arkansas, it is a central database for licensed trucking agencies, medical review officers and service providers where all positive drug and/or alcohol test results, refusal to submit to a drug and/or alcohol test, or submission of an altered specimen must be reported. Employers and are required to search the database before making a hire. Employers and medical review officers must report any positive results or refusals on the database website. Medical officers must also report altered specimen (Arkansas).

**Commercial Vehicle Permits/Decals**

This is a general classification for states offering online permitting services for commercial vehicles. This includes tax permits, fuel permits and oversize/overweight permits (Alabama, Arizona).
Convert an Out-of-State License

Individuals moving to the state can complete an online application to convert an out-of-state driver’s license, commercial driver’s license or learner’s permit (Massachusetts).

County Pride Stickers

Residents of Maryland wishing to exhibit their county pride may purchase a $5 county pride sticker for their standard license plates (Maryland).

Crash Statistics

Some states publish annual reports detailing vehicular crash/collision statistics. These reports may be useful to other state agencies, federal agencies, local authorities, journalists and concerned citizens (Arizona).

Criminal Background Check

This service is offered to commercial vehicle or trucking agencies wishing to conduct background checks on applicants for trucking jobs (Arkansas, Texas).

De-Insured Certificate/Affidavit of Non-Use

Individuals wishing to obtain exemption from mandatory insurance requirements for vehicles they own but will not operate on public roadways can apply for a de-insured certificate (Arizona).

DMV Practice Test

Individuals preparing to take a driver’s examination test can practice using this online application. In Nebraska, one can specify the number of randomly generated questions he or she wants to answer. Individuals are then asked multiple-choice questions and the application tells individuals whether their answer was correct or incorrect, and the correct answer is shown on the screen (Nebraska).

DMV Service Reminder

Reminds individuals when a license or vehicle registration renewal date is approaching. In Massachusetts, individuals who sign up can be reminded via phone, e-mail or text message (Massachusetts).

DMV Wait-Time (Estimated Minutes or Webcams)

In an effort to control the flow of customers, some states have begun offering information to residents about the average wait time or level of traffic in local DMV offices. In New Mexico,
this is done by posting the average wait time. In Alaska, Web cams show customers the lobbies of DMV offices around the state (Arizona, New Mexico).

**DMV Web Survey**

This application allows individuals to provide feedback about the department’s vehicle regulation website (West Virginia).

**Driver Cross-Check**

Service for businesses where the state automatically sends e-mails to managers any time a change is made to the driving record of an employee (Maine).

**Driver’s License Reinstatement**

Online service which allows residents to reinstate suspended driver’s licenses and pay reinstatement fees online (Arizona).

**Driver’s License Statistics**

Some states publish annual reports detailing the number of driver’s licenses and ID cards issued in the state each year. These reports may be useful to other state agencies, federal agencies, local authorities, journalists and concerned citizens. Statistical categories may include driver’s licenses, commercial licenses, motorcycle licenses or personal identification cards. The data may be subset by year, county, gender or age (Arizona).

**Driver’s License Status Check**

In Florida, this option allows individuals to check the status of their driver’s license, car insurance and driving school eligibility, as well as the validity of the social security number on file with the DHSMV (Department of Highway Safety and Motor Vehicles).

**Driver’s License Transaction Status**

Additionally, some states allow individuals to check the status of an order for a driver’s license (Virginia).

**Driver’s License/ID Renewal**

Driver’s license renewals can be renewed online in some states. In California, any class license can be renewed so long as there is no change of address, there is a verified Social Security number on record, the user is registered with the DMV Web site, and has a valid credit card or checking account. Licenses in California are mailed out using the most recent photo on file (California).
New ID
Interactive application process that allows individuals to fill out application for new Massachusetts IDs, liquor IDs or retrieve a previously saved transaction (Massachusetts).

Driving History Records
Residents can purchase and access their personal driving record online in several states. These records usually provide all system entries for an individual in the previous three to five years. Entries typically include any license issuance, renewal, traffic citations and court actions. There are some notable differences in the level of access from state to state. Employers in some states may have a greater degree of difficulty obtaining a driving history record for an applicant or employee than in other states. Some states make accessing another individual’s record more difficult than others (Arizona).

Duplicate Driver’s License or ID Card
Residents with a lost or stolen driver’s license may apply for a duplicate license online. In Arizona, the system is also set up to allow residents to pay abandoned vehicle fees, returned check fees and returned check amounts (Arizona).

Duplicate Vehicle Registration
Residents can purchase and print duplicate copies of vehicle registration forms (Arizona).

Duplicate Vehicle Title
Residents can electronically request and purchase a duplicate vehicle title. Method of delivery may vary. Florida allows residents to print copies from a personal computer, whereas Maryland sends duplicate titles via mail (Florida).

Electronic Toll Program Enrollment
This online service allows individuals to enroll in their state’s Fast Lane or express toll program (Massachusetts).

Emergency Contact Information
This service allows individuals to add emergency contacts to their driver’s license or state records (Colorado).

Enter Plea/Appeal Traffic Conviction
In New York, individuals charged with certain traffic offenses may enter a plea online or appeal a traffic conviction in certain situations (e.g. if the ticket comes from the Traffic Violations Bureau) (New York).
Equipment Recovery and Identification Program

This program is designed for owners of both commercial and farm grade equipment to enter specific information regarding their property into a database that will be utilized by law enforcement personnel in tracking stolen equipment (Texas).

Fleet Registration Renewal/Management

Fleet registration allows commercial trucking agencies to manage all vehicle registrations simultaneously in one account. In Arizona, the registration can be set up so that each vehicle registration expires at the same time. Motor carriers can choose which month they would like the fleet registration fee to be due. In Idaho, it is possible to renew all registrations at the same time, but the renewals are still individualized. In New York, individuals may transfer license plates or transfer vehicles within their IRP fleet (Arizona, Idaho, New York).

Fuel Tax Evasion Report

Individuals can file a report of the illegal sale or use of dyed diesel fuel or other form of untaxed product, such as used motor oil, biodiesel produced or solid from a source other than a retail location, other waste oil, or any case of fuel tax evasion (Nevada).

Fuel Tax/Weight Distance Tax Filing

States with a motor fuel tax often have online Web sites set up in order to allow online tax filing. This fuel tax is usually based on intrastate trucking and is distinct from the IFTA tax. Several states have such taxes, such as Kentucky, Oregon, New Mexico, New York and Arkansas.

Weight Distance Tax Information/Filing

States with weight-distance taxes may allow online filing of those taxes with the motor carrier or trucking division in their transportation cabinet (Oregon, New Mexico, Kentucky and New York).

Handicap Placard Application/Renewal

In Delaware, residents 85 and over may apply for a new handicap placard, and all current handicap placard holders may submit renewals online (Delaware).

Hazardous Materials License/Endorsement Renewal

Motor carriers are required to secure endorsements for drivers hauling hazardous materials through the Transportation Security Administration (TSA). Typically, drivers will have to undergo a background check and take a written test in order to obtain this endorsement, which is then applied to the driver’s commercial driver’s license (CDL) (Missouri, Idaho).
**Impounded Vehicle Service**

Allows residents or visitors to enter the VIN, license plate information or impound form number to locate a towed vehicle and figure out how/where to retrieve the vehicle (Utah).

**Inspection Lane Video Feeds**

Delaware has Web cams overlooking the vehicle inspection lanes for brake tests and safety and emissions tests at its DMV field offices. This allows individuals to assess wait times for emissions tests from their computer (Delaware).

**Insurance Lapse Civil Penalty Payment**

In New York, if you received an Order of Suspension (FS-70T) for a lapse in automobile liability insurance, you can pay the civil penalty on-line and remove the suspension (New York).

**Insurance Verification/Status**

Online insurance verification service is meant to assist the state whenever it has conflicting information from insurance companies and existing registration records. In particular, VIN mismatches can create administrative problems resulting in potential suspension of registrations. Users can use this service to enter insurance information and vehicle VIN numbers in order to clear up inconsistencies in state records (Arizona).

In some states, insurance companies are allowed to file SR-22 or SR-26 forms online in order to provide documentation of coverage for their customers (Idaho).

**International Fuel Tax Agreement (IFTA) Tax Filing**

International Fuel Tax Agreement (IFTA) tax filing is available online in most states. The IFTA covers fuel taxes on all fuels used to power vehicles qualifying under IFTA regulations. The reports and taxes must be filed and paid quarterly. States typically offer online filing through their DMV Web site (Arizona), motor carrier or trucking portal (New York) or the state’s department of revenue (Arkansas) (Arizona, New York, Arkansas).

**International Registration Plan (IRP) Filing**

International Registration Plan (IRP) allows registration fees for commercial carrier fleets to be apportioned among multiple states/provinces. IRP members include all contiguous states, Washington D.C. and some Canadian provinces. The trucking company can then pay money to the state/province, which then passes along the apportioned fees to the other affected jurisdictions (Kentucky).
iPhone/iPad Application

Alabama’s Department of Revenue has an iPhone application that allows people to check availability of specialty and personalized license plates, find DMV offices, forms, state contact information, FAQs and external links.

Nebraska has an application for iPhone/iPad that allows individuals to take a practice driving exam (Nebraska, Alabama).

IRP Plate Inquiry

Make online inquiries about IRP plates and get the following information:

- Year, make, VIN and unit number of the vehicle;
- Expiration date of the vehicle's registration;
- Name and address of the registrant;
- Plate status;
- Registered weight for each jurisdiction registered for (Oregon).

License Plate Tab Replacement

Tab replacement allows individuals with registered vehicles to replace lost or mutilated license stickers showing an up-to-date registration (Arizona).

Live Help

Colorado has developed an online application that allows individuals to chat live with customer service representatives. The chat link is available on the Colorado.gov portal and all related Web sites managed with the same software, including Colorado’s Department of Revenue site, which handles motor vehicle/license transactions (Colorado).

Miscellaneous Publications and Forms

Miscellaneous publications, forms and research reports released by a state’s DMV or ancillary agencies are frequently posted online. These publications include statistics about certain DMV programs, safety studies (California), driver manuals, industry handbooks, publication of transportation laws, sample driving tests, strategic plans and other news (All States).

Misuse of State Vehicle Report

This online form allows individuals to report misuse of state vehicles leased by executive branch agencies, boards and commissions. In Arkansas, the Office or Administrative Services (OAS) processes the complaints and reports the alleged misuse to the appropriate agency or department. The Arkansas OAS also maintains responses to such allegations (Arkansas).
Motor Carrier Fleet Reports

Motor carrier outfits can get detailed information about scale crossings, safety inspections, permits, insurance, account balances and other detailed information about fleet vehicles registered in a particular state (Oregon).

Motor Carrier Statistics

A few states publish data regarding the number of commercial companies and trucks registered in the state, and in some cases the frequency of online motor carrier transactions (Oregon, Nebraska).

New Vehicle Registration

Most states require you to visit the DMV offices when registering a new vehicle. However, Indiana allows new vehicles purchased within the last 45 days to be registered online provided a title has been issued (Indiana).

Non-Commercial Vehicle Decals

States issue various vehicle decals as documentation of registration and meeting state regulations for a particular type of vehicle. Ex: In Arizona, off-highway vehicle decals are issued for ATVs with a weight of less than 1,800 pounds (Arizona).

Notice of Lease Termination

Update registration records to reflect the termination of an existing lease between a company/corporation and another entity or owner/operator (Louisiana).

Online Training for Commercial Drivers/Vehicle Operators

Instructional videos for commercial vehicle drivers and/or operators that instruct individuals in driver training, transport of hazardous materials, DOT audits, and state vehicle regulation agencies and programs (Minnesota).

Order Inspection Stickers

In New York, dealers, inspection stations, and repair shops can order inspection stickers on-line (New York).

Organ Donor Registration

Some DMV sites have an online organ donor registry for individuals interested in participating (Arizona).
Overweight Citation Payment

Motor Carriers fined for carrying overweight loads without a permit can pay the citation online (Virginia).

Pay Driver Civil Penalties

In New York, a driver civil penalty results from a revocation of your driver’s license or driving privilege or from a suspension under the NYS Zero Tolerance Law for drivers under age 21. The related civil penalty must be paid before you can receive approval to apply for new driver’s license or driving privilege at the end of the revocation period, or to end a Zero Tolerance Law suspension (New York).

Pay Road Test Fees

Pay fees for road test online. In New York, individuals may do this for passenger car, motorcycle or CDL-related road tests (New York).

Pay Surcharge/Assessment Fees

This service allows individuals to pay surcharge fees online. Surcharges are fines assessed by MVC on an annual basis for drivers who have earned excessive points or committed a specific violation such as DUI. Surcharges are in addition to any court fines/penalties. In New York, this fee is known as a driver responsibility assessment fee. According to the New York DMV, this fee is paid in addition to any fines, fees, penalties, or surcharges that you pay for a traffic conviction; you must pay the driver responsibility assessment as well. The assessment is an amount that you must pay each year for three years. You pay the assessment to the DMV (New Jersey, New York).

Permitting Agencies/Service Provider Services

In Kentucky, there is an online application for permitting agencies, service providers or any third-party agencies that provide state-issued permits to commercial trucking firms operating in the state (Kentucky).

Personalized Plate Ordering/Searches

Personalized plates should be distinguished from specialty plates. Personalized plates have customized letters and numbers appearing on the license plate. Individuals may use numbers and letters to spell something distinctive such as “HOTROD” or “MEEMAW.” Online customization is available in some states. Sometimes, the order forms can be filled out electronically for processing (e.g. Arizona). In other states, they have to be mailed to the DMV office. Some states that do not allow direct purchasing will allow online searches of personalized license logs to see if a particular combination of characters is available (e.g. Connecticut).
Personalized/Specialty Plate Status

Check the status of a personalized or specialty plate order by filling out an online form. In Missouri, an individual may do this if at least three weeks have passed since an office/phone order of a personalized/specialty plate has taken place (Missouri).

Plate Exchange

Allows individuals to keep their existing personalized name and switch to a different plate type outside of your normal registration window (Ohio).

Press Release List Service

This service allows individuals to register their e-mail with the state’s vehicle regulation department in order to receive instant news updates (Michigan).

Public Sex Offender Registry

This online application allows you to search the registry, use the subscription service and download the registry (with additional access for Social Networking Website Operators) (Texas).

Recreational Vehicle Show Notification Request

The Michigan Department of State's Bureau of Regulatory Services provides a convenient online request service for licensed vehicle dealers to participate in temporary recreational vehicle shows. Notification requests must be submitted at least 14 days before the recreational vehicle show begins.

Recreational vehicle show producers simply complete the notification request form and click the submit button. Once the request is approved, confirmation will be e-mailed or faxed to you within seven business days (Michigan).

Refunds

Arizona

Arizona offers a plate credit/refund service for commercial carriers that provides for a refund or credit toward the following taxes:

Credit
Vehicle License Tax (VLT)
Commercial Registration Fee (CRF)
Weight Fee (WGT)
Motor Carrier Fee (MCF)
Use Fee (UTX)
Processing Fee (PRC)*
Refund
Vehicle License Tax (VLT)
Commercial Registration Fee (CRF)
Weight Fee (WGT)
Motor Carrier Fee (MCF)

In Arizona, the credit can only be applied toward the tax for which there is credit. For example, vehicle license tax credit could only be used. Refunds come with a $12 service fee.

California
California offers refunds for residents mistakenly charged a late payment fee, registrations that expired after a resident left the state and registered a vehicle elsewhere, or because a charged fee was dismissed in court and reported to the DMV (Arizona, California).

Registration Compliance-Violator Report
Online form allows individuals to report fellow residents in Arizona for not being in compliance with motor vehicle registration laws. In Arizona, the Motor Vehicle Division Web site explains which individuals must register their vehicles with the state (Arizona).

Registration Fee Calculator
Enter basic information about your vehicle and this online application will return a registration fee estimate (Louisiana).

Registration for Vehicle Dealer Training
This service allows online registration for classes that instruct dealers about the basic requirements of the state’s vehicle code (Michigan).

Renew DMV-issued Business Certificates
Business licenses and certificates under the jurisdiction of the state DMV can be renewed in a few states (New York).

Renewal Status
Some states allow individuals to check the status of a renewal. In Minnesota, individuals can check the status of registration renewals, special plate purchases and IRP renewals (Minnesota).

Report Smoking Vehicle
Individuals who observe a smoking vehicle, or a vehicle that is in violation of the state’s emission standards, can report violators by submitting an online report (Nevada).
Request Reinstatement Letter

This allows individuals with suspended licenses to request a letter that lists the actions you must take to have your driving privilege restored (Pennsylvania).

Revenue/Budgetary Statistics

Some states publish data about the amount of revenue generated by different fees and services during recent fiscal years. The state of Florida provides a simple pamphlet that contains detailed information about several aspects of its department finances (Florida).

Salvage Yard Auto Hulk

This application allows salvage yards to send the DMV information about crushed vehicles (Louisiana).

Schedule or Confirm DMV Appointment/Road Test

This service allows individuals to sign up for road tests administered before the issuance of a driver’s license, motorcycle license or commercial driver’s license. Residents typically cannot schedule a test less than 24 hours in advance, and may be asked to pay the fee in advance. In some states residents may also schedule a DMV office appointment (Alaska, California).

In Georgia, you can review and confirm reservations previously made by phone or in person, but cannot make reservations online. One can only check the status of the reservation and print confirmation or request an e-mail reminder.

In New Jersey, you can schedule an emissions test online (New Jersey).

Social Security Number Verification

Individuals who receive random SSN checks from their state DMV can verify the agency’s records online (New York).

Sold Notice/Notice of Transfer

Residents can give the state motor vehicle division electronic notification of a vehicle sale, transfer or ownership or termination of a lease. Sold notices should be filed by the vehicle’s current owner (not the new owner), and the vehicle must be registered to the state with an annual registration type (Arizona, California).

Specialty Plates Ordering/Browsing

This online service allows residents to order specialty plates online. Specialty plates are similar to standard issue plates in the sense that the state licensing agency chooses the characters on the plate. However, they have a different plate design than a standard license plate. These specialty...
plates are typically designed to represent a charity or civic organization. Additional fees apply, some of which usually goes to the corresponding organization represented on the specialty plate. Restricted specialty plates are plates that will only be issued to individuals meeting specific criteria (e.g. veterans, disabled individuals, state government official). These specialty plates are not available to the general public and require additional documentation.

Online customization is available in some states. Sometimes, the order forms can be filled out electronically for processing (e.g., Arizona and Illinois). Other states with online services have the specialty plate options posted online and allow users to browse photos of available plates (Arizona, Illinois).

**State Traffic Information**

Several states now have detailed real-time traffic information on the Internet, usually in conjunction with the state’s “511” traffic program. In states such as Kentucky, there are interactive maps powered by Google that provide information concerning road closures, accidents, roadwork, traffic delays, road conditions, weather warnings and lane closures. Arizona has a similar map, as well as estimated freeway travel times and freeway Web cams that give viewers real-time images of the state’s busiest roadways.

Montana has real-time accident reports and a map tracking accident locations reported by the Montana Highway Patrol.

Two rules were used for deciding whether or not a state site had traffic information: the information had to be on the DMV Web site or directly linked on the portal page of the Web site. States housing such information elsewhere do not get credit for having the information on their DVR Web site (Montana).

**Submit 10-Year Driver’s License Info**

This service allows individuals with a commercial driver’s license to submit a ten-year driver’s license history online (Pennsylvania).

**Teen Driving Records**

Some states allow parents to check the driving record of teens under 18. Similar to driving history records but here is coded as a distinct service. The purpose of the application seemed sufficiently distinct to warrant a separate category. Unlike most driving records, the teen records are generally provided free of charge (Florida and Illinois).

**Temporary Emissions Extension, Waiver**

States with emissions programs will sometimes grant extensions or waivers to certain individuals or individuals owning particular types of vehicles. In Maryland, residents may file for an
extension for the state’s Vehicle Emissions Inspection Program (VEIP) that allows individuals an additional six to eight weeks to schedule and complete an emissions test, or opt out of it if state requirements are met (Maryland).

**Temporary Permits/Registration**

Temporary permits are used to provide individuals a legal way to drive a vehicle that is not yet registered with a state’s vehicle regulation department. Individuals can obtain such a permit when selling an existing vehicle after transferring their license plate/credit to a newly acquired vehicle, or if the vehicle needs repair in order to pass an emissions test.

In Arizona, individuals may apply for and receive a three-day restricted use permit or a 30-day general use permit. The restricted use permit prohibits the use of the vehicle for reasons unrelated to its registration. Driving a vehicle in order to have it repaired, pass an emissions test or go to the motor vehicle licensing office are all acceptable uses of a restricted permit. General permits allow unrestricted use of the vehicle for the time it is current. Car dealerships may issue 90-day temporary permits for vehicles they lease or sell.

**Traffic School Completion Check**

Provides online verification that a Driver School course has been taken (Florida).

**Traffic School Online**

As a cost-cutting measure, some states offer traffic school courses online (Kentucky).

**Traffic, Parking or Toll Citation Payment**

Traffic citations and fines can be paid online. In most states, this is handled at the local level. California’s DMV site links individuals to an appropriate county-level court website so individuals can pay tickets issued in any county.

**Transaction Status Check**

Some state DMV Web sites allow individuals to check on the status of online transactions (New Mexico).

**Transponder Application/Obtainment**

Motor carriers may apply for a transponder online in some states (Oregon).

**Unified Carrier Registration**

The Unified Carrier Registration Agreement (UCR) was established by the Unified Carrier Registration Act of 2005. All interstate and international carriers must register with the United States Department of Transportation and pay UCR fees. Some states allow motor carriers to pay these fees online (North Carolina).
Uniform Commercial Code (UCC)

The Uniform Commercial Code (MCL440.1101 through MCL 440.11102), or UCC, as it is commonly abbreviated, provides a central location in Michigan for filing a public notice of a secured transaction. This notice, called a financing statement, is evidence of a commercial agreement between two parties, called the debtor and secured party. The department's UCC office, upon request, also searches the filed information by name. When a business applicant pledges collateral on a loan, UCC search results tell lenders whether others have filed a claim against the same collateral.

An application on the Michigan Secretary of State Web site allows individuals to search UCC records (Michigan).

Vehicle Insurance Update

Individuals who have recently purchased or renewed liability insurance can use this online application to update their DMV with new insurance information. The DMV then uses the provided information to confirm a vehicle owner’s insurance policy with their insurance company. In Nevada, this service is available for individuals, business, and insurance agents (Nevada).

Vehicle Records (Title, Registration, Liens)

Online motor vehicle records allow individuals to access registration, title and lien information about their vehicle. The motor vehicle record service in most states allows individuals to access information about previous registrations, titles and owners of their vehicle (if applicable). In Florida, individuals can have their titles maintained electronically in order to eliminate the risk of having it lost or stolen. Florida residents may also file an electronic request for paper copies of vehicle titles for personal use (Arizona, Florida).

Vehicle Registration Cancellation

Individuals who no longer own or drive a particular vehicle may cancel its registration online (Utah, Connecticut).

Vehicle Registration Fee Calculator

This application allows individuals to calculate registration fees for their vehicles in the next registration cycle. In California, individuals enter information about the vehicle, its current registration status, and whether they are current residents or if the vehicle is currently registered in another state (California).

Vehicle Registration Renewal
Motorists can renew their vehicle registrations online. The eligibility requirements can vary from state to state. Typically there are some restrictions, such as registrations only for non-commercial vehicles, owners without currently expired registrations or recent change of address. Some states allow online renewal for various types of vehicles. For example, Alaska allows online registration of cars, trucks, motor-homes, trailers, boats, snow machines, ATVs and motorcycles. Some states charge convenience fees in order to cover the processing charges assessed by credit card companies. Other states, such as Alaska, charge a $10 fee for paying registration in person, whereas the fee is waived if the registration is paid online. Michigan allows online renewals for watercraft registrations (Alabama, Alaska, California, Connecticut, Louisiana).

Vehicle Registration Statistics

Information about vehicle registrations are published by some states, detailing the number and types of vehicles registered, license plates issued, or both.

Vehicle Registration Suspension and Reinstatement

In 2000, the state of Alabama passed the Mandatory Liability Insurance Act, which required everyone driving a vehicle to at least have liability insurance coverage. In order to verify coverage, MLI (Mandatory Liability Insurance) questionnaires were sent to randomly selected individuals in the state, who were to respond in order to provide proof of coverage. Failure to respond to the questionnaire results in the suspension of the resident’s registration. The state set up a Web site that allows citizens to verify their insurance in order to avoid suspension of their vehicle’s registration or to reinstate a suspended registration (Alabama).

Vehicle Registration Transaction History

This online service allows citizens to electronically obtain and print a report of all registration fees paid during the prior calendar year (Arizona).

Nevada has a similar system, and allows individuals to confirm insurance status, respond to state requests for insurance verification or provide insurance information for suspended vehicles.

California has an online program allowing individuals who have received a letter from the California Department of Motor Vehicles stating their vehicle registration would be suspended in the near future or has already been suspended (California).

Vehicle Titling

Individuals purchasing a new vehicle may file the vehicle title application online (Illinois).

Vehicle Transaction Status

Check the status of an online title, registration renewal, or duplicate title or renewal transaction (New York).
**Verify Payment Plan Eligibility**

Individuals who wish to pay driver’s license reinstatement fees in South Carolina may do so online (South Carolina).

**View Inspection Results**

Vehicle inspections are conducted in some states to make sure registered vehicles are compliant with state emissions standards. In New Jersey, individuals can access the inspection results online (New Jersey).

**Waste Tire License Renewal**

Transporters of Hazardous Waste (includes waste oil, combustible liquids, corrosives, poisons/toxins, flammable liquids, flammable solids, PCB’s and infectious waste) must obtain a Hazardous Waste Transporter License Certificate.

Transporters of Waste Tires (tires that are no longer suitable for their intended purpose because of wear, damage, or defect) must obtain a Waste Tire Hauler Permit.

The license/permit issued is valid for one year and helps ensure environmental protection through proper disposal of waste (Missouri).

**Weight Receipts**

In the state of Oregon, motor carriers can obtain a state weight receipt and tax identifier, as well as amend, replace, renew or cancel a receipt (Oregon).