



# InterPARES 2 Project

International Research on Permanent Authentic Records in Electronic Systems

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New York State Department of Motor  
Vehicles On-line Services System

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## **Case Study Research Team**

Philip Eppard, Terrence Maxwell, and Mark Wolfe with assistance from graduate students, Rachel McMullin, Joshua Hauck-Whealton, Peter Runge, Jessica Zacher, Richard Hoppenstedt, and Reginald White.

## A. Case Study Overview

The original plan and scope for the Department of Motor Vehicles Online Services case study was proposed at the Antwerp, Belgium International meeting in June of 2003. Philip Eppard, Terrence Maxwell and Mark Wolfe led the case study investigations.

As a result of New York State's "Government Without Walls" e-commerce initiative started on June 12, 2000, the New York State Department of Motor Vehicles (DMV)<sup>1</sup> now offers many online services to citizens and corporations. According to the New York State's Office for Technology, "The foundation of the 'government without walls' theme is to break down the walls of individual State agencies for citizens and businesses dealing with State government and allow them to conduct business and find information anytime, anywhere without having to know which agency handles each type of transaction—a one-stop shopping concept."<sup>2</sup> The DMV conducts numerous online services with customers via a Web browser, such as registration renewal, driver's license ordering and renewal, custom plate ordering, and scheduling driving tests (Figure 1). Users conduct legal and financial transactions within the Web site, which generates records in a networked and online environment.

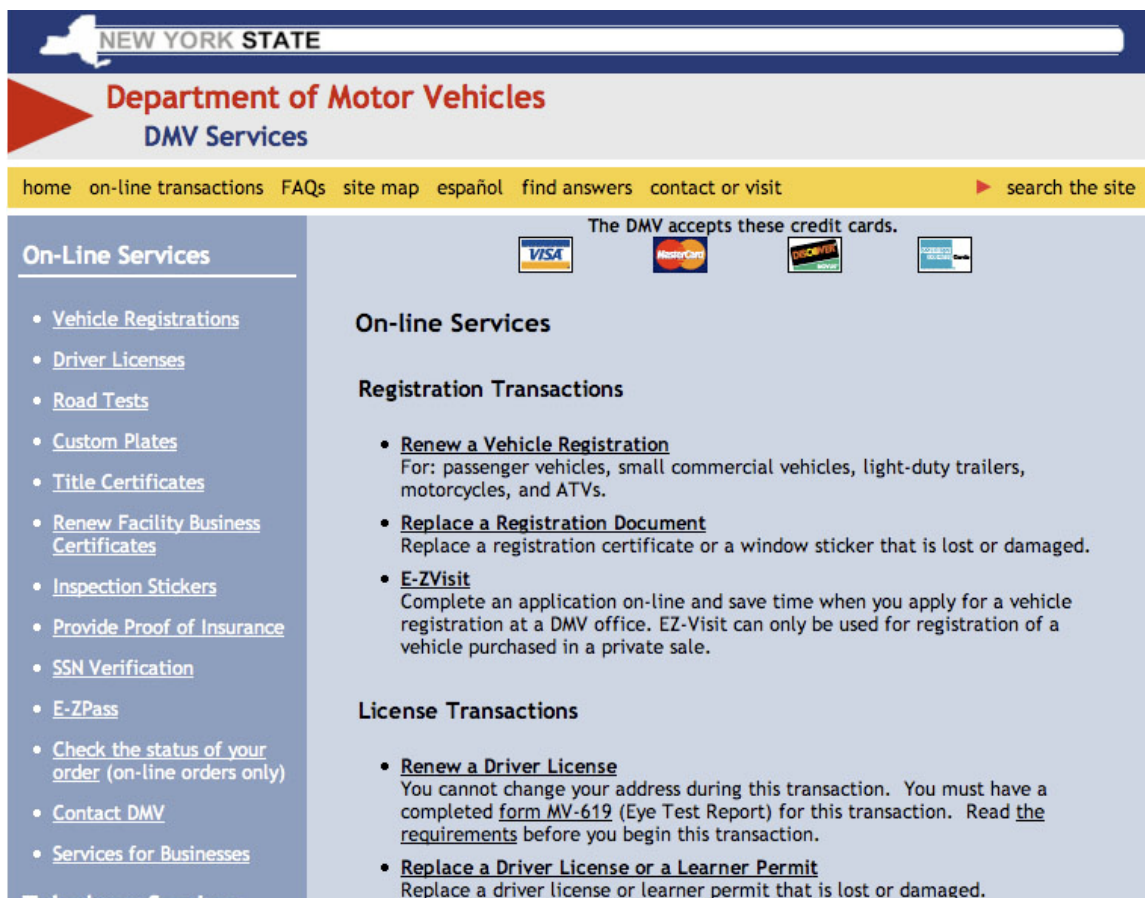


Figure 1. Screenshot of the Online Services home page.

<sup>1</sup> <http://www.nydmv.state.ny.us/transact.htm>.

<sup>2</sup> [http://www.oft.state.ny.us/ecommerce/plan\\_final.pdf](http://www.oft.state.ny.us/ecommerce/plan_final.pdf).

The Online Services system facilitates broadly three core business functions: drivers' licensing, vehicle registration and title ownership. The Online Services system complements the internal electronic legacy system and the business rules that have applied to it.

## **B. Statement of Methodology**

- Contacted New York State Department of Motor Vehicles (DMV) about proposed case study (February 2003)
- Submitted case study proposal to International Team in Antwerp for approval (June 2003)
- Created questionnaire based on the 23 questions case study interview protocol (July 2003)
- Interviewed DMV case study participants (February 2004)
- Transcription of interview tapes (March 2004)
- Follow-up questions and collected additional documentation (June 2004)
- Draft report completed (May 2005)
- Final report submitted (March 2007)

## **C. Description of Context**

### **Provenancial**

The Department of Motor Vehicles (DMV) is one of twenty departments in the executive branch of the New York State government. Although the DMV as it exists today was created by a constitutional amendment in 1959, the origins of the department go back to 1901 when the state legislature first required vehicle registration.<sup>3</sup> The DMV is headed by the commissioner of motor vehicles, who is appointed by the governor with the approval of the state senate.<sup>4</sup> Reporting to the commissioner is an executive deputy commissioner. There are also deputy commissioners for operations and customer services; administration; legal affairs; and safety, consumer protection and clean air.

According to its mission statement, the DMV “promotes traffic safety, provides consumer protection and information services and assists other government agencies to achieve their missions.” In the course of business, the DMV collects fees and revenues to support services.<sup>5</sup> The DMV operates three regional offices (Albany, Long Island and New York City) and thirty district and branch offices in addition to the offices of ninety-eight county clerks, who also register drivers and motor vehicles.

The DMV is responsible for carrying out a variety of functions, including:

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<sup>3</sup> Department of Motor Vehicles Agency History Record, *New York State Archives*.  
<http://nysl.nysed.gov/uhtbin/cgisirsi/kTmflnBvqk/15940124/88>.

<sup>4</sup> New York State Vehicle and Traffic Law §200.

<sup>5</sup> <http://www.budget.state.ny.us/archive/fy0405archive/fy0405app1/dmv.pdf>.

- Issuing driver licenses, vehicle registrations, and vehicle titles
- Overseeing driver education and rehabilitation programs
- Monitoring driving schools and instructors
- Registering auto dealers and repair shops
- Certifying vehicle inspectors, salvage businesses, and damage estimators
- Monitoring safety and emissions inspection stations
- Adjudicating traffic violations in some parts of the state
- Conducting research and developing programs that promote public safety, reduce drunk driver problems, and encourage safe driving practices<sup>6</sup>

The DMV's online services system encompasses only a small part of the DMV's overall functions. Only a portion of the business transactions supported by the DMV can be accomplished via its Web site, and there are no services provided by the Web site that are exclusive to that medium. Another limitation to the online system is that a user must first have established a core record in the DMV's system during an in-person office visit before s/he is eligible to conduct any transactions online. For instance, a user must apply for their first New York driver's license in person, but can then subsequently apply for a renewal or replacement online. Currently, approximately 2% to 10% of all DMV transactions take place through the online services system. Possible online transactions include:

- Renewing or replacing a driver's license
- Renewing or replacing a vehicle registration
- Replacing a title certification
- Ordering a driver's record abstract
- Paying fees
- Ordering personalized license plates
- Scheduling a road test<sup>7</sup>

In addition to these online transactions, the DMV's Web site allows users to find information, download forms, read publications and statistics, and send e-mail to the DMV.

The online system falls under the control of the deputy commissioner for administration. Below him are individuals responsible for driver licensing, vehicle registration, and vehicle title. The information technology department also falls under the deputy commissioner for administration.

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<sup>6</sup> This list of functions was compiled from the Department of Motor Vehicles Agency History Record, *New York State Archives* (<http://nysl.nysed.gov/uhtbin/cgisirsi/kTmflnBvqk/15940124/88>), the New York State budget (<http://www.budget.state.ny.us/archive/fy0405archive/fy0405app1/dmv.pdf>), and the DMV's Web site (<http://www.nydmv.state.ny.us/>).

<sup>7</sup> <http://www.nydmv.state.ny.us/transact.htm>.

## **Juridical-administrative**

### *Administrative History*

- The department was created in 1901 (Chapter 531) as a result of legislation that required the registration of all vehicles. By 1924 (Chapter 360), all drivers were required to be examined and registered with New York State.<sup>8</sup>
- Until 1921, the secretary of state registered and licensed all vehicles and drivers, then the duties were transferred to the State Tax Department (Chapter 90).
- From 1926 to 1959, the DMV was administered through the Bureau of Taxation and Finance, but in 1960 it was replaced by the Department of Motor Vehicles, which is one of the twenty agencies that reports to the Executive Branch.<sup>9</sup>
- The DMV has remained in the executive branch since 1960 (Chapter 464).
- The DMV added its online services system in 1998 and has continued to develop and expand the system under Governor George E. Pataki's New York's e-commerce initiative, which was established in 2000 to create a "Government Without Walls." Empowered legally to engage in e-government, New York State formalized the technological structure into an enterprise network under the name, NYeNet.<sup>10</sup>

### *Laws and Regulations Affecting the DMV and the On-line Services System*

VAT (Vehicle and Traffic Law). The New York State Vehicle and Traffic Law establishes the DMV's powers and duties, lays out its basic structure and operational guidelines, and mandates specific programs.

Cyber Security Policy (New York State Office of Cyber Security and Critical Infrastructure Coordination Policy P03-002). The purpose of the Cyber Security Policy is "to define a set of minimum security requirements that all state entities must meet."<sup>11</sup>

ESRA (Electronic Signatures and Records Act). A New York state law signed on September 28, 1999, ESRA is a part of the broader State Technology Law that authorizes the use of electronic signatures and records to facilitate e-government in state and interstate commerce. Under the Electronic Signatures and Records Act § 540.4, "The use of an electronic signature as defined in ESRA shall have the same validity and effect as the use of a signature affixed by hand."<sup>12</sup>

DPPA (Driver's Privacy Protection Act, 18 U.S.C. section 2721 ff.). A federal law protects drivers' personal information by regulating how the DMV shares information in its records.<sup>13</sup>

Accessibility of State Agency Web-based Intranet and Internet Information and Applications (New York State Office for Technology Statewide Technology Policy P04-002 and Mandatory

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<sup>8</sup> Department of Motor Vehicles Agency History Record, *New York State Archives*.

<sup>9</sup> <http://nysl.nysed.gov/uhtbin/cgiirsi/kTmflnBvqk/15940124/88>

<sup>10</sup> <http://www.budget.state.ny.us/citizen/structure/structure.html>.

<sup>11</sup> <http://www.oft.state.ny.us/nyt/overview.htm#history>.

<sup>12</sup> <http://www.cscic.state.ny.us/lib/policies>.

<sup>13</sup> <http://www.oft.state.ny.us/policy/esra/esra.htm>.

<sup>14</sup> <http://www.nydmv.state.ny.us/qaprive.htm>.

Technology Standard S04-001). This policy and its accompanying technology standard are designed to ensure that state agency Web-based Internet and intranet information is accessible to persons with disabilities.<sup>14</sup>

Regulations established by credit card companies. As the online services system accepts payments via credit cards, it must comply with credit card company regulations.

Internal DMV technology standards. In addition to external laws and regulations, the DMV has developed its own standards for creating online transactions.

## **Procedural**

The addition of the online services system in 1998 did not result in any major additions to the DMV's business procedures, since existing procedures that had been developed for onsite and phone transactions could be adapted to the new medium. While the DMV's technology has undergone major changes under the new system, its basic procedures have not. When new business procedures are needed, as when new legislation necessitates changes, they are developed in a collaborative effort between numerous parts of the DMV organization. While the deputy commissioner for operations is ultimately responsible for the creation of accurate records, the program analysis, IT, and legal departments work with operations to design new workflows compliant with the new law. Finally, the new procedures are checked and approved by the audit department.

Procedures in the online services system have been set up to mirror as much as possible the procedures for transactions conducted in person at a DMV office. It should be noted that onsite transactions are not equivalent to paper transactions; rather, both onsite and online transactions result in digital records (though paper forms submitted at a DMV office are retained). A typical onsite transaction would include the following elements:

- Customer provides proof of identity (in the forms of documents such as a passport, social security card, etc.).
- Customer provides data on paper forms, which is entered into the system by DMV employees (creating a digital record).
- Payment is made (credit card, cash, certified check, or money order).
- Customer receives confirmation that the transaction was successful from the DMV employee.
- Customer either receives the new document or a receipt, in which case the document will be sent to the customer by mail.

Online transactions are made up of parallel, though not exactly identical steps:

- Customer provides proof of identity (customer must provide information that matches that held in a pre-existing core record).

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<sup>14</sup> <http://www.oft.state.ny.us/policy/index.html>.

- Customer enters data into the online services system, which is transferred to the back end core system (creating a digital record). The online forms do not imitate the look or format of the paper forms used for onsite transactions.
- Payment is made (credit card only).
- Customer receives an onscreen confirmation that the transaction was successful.
- Customer receives an email confirming the transaction and the new document is sent to the customer by mail.

## **Documentary**

The Department of Motor Vehicles follows the retention and disposition requirements of the New York State Arts and Cultural Affairs Law.<sup>15</sup> In accordance with those requirements, the Vehicle and Traffic law sets minimum retention dates for electronically or mechanically created records.<sup>16</sup>

- Certificates of titles shall be retained for seven years from the date of issuance, plus an additional three years of inactivity regarding the titled vehicle.
- Records of liens shall be retained one year after the satisfaction of the lien.
- Renewal of any vehicle registration shall be retained for one year after the expiration of the registration issued.
- Licenses shall be retained for two years after expiration.

The deputy commissioner for operations is responsible for the creation of accurate records. All digital records are stored in the DMV's back end core system. Only the current version of a record is available, because snapshots of older versions are not made; however, the audit trail that is connected to the record show what changes have been made in the past.

When an official copy of a record is required, the DMV's system produces a paper representation of the record, which can be certified. Only such paper representations are certified, because the DMV considers other media to be editable. The DVM calls these representations of records abstracts. They show the current status in the core record and the dated relevant transactions that indicate the prior status of the record.

## **Technological**

The DMV's system was developed in two parts. The back end core system, which is a mainframe system, originated in the 1960s and has been maintained and updated since that time. The mainframe is actually run by the New York State Office for Technology (OFT) not the DMV. The second part is the online services system, which is a Web-based system that interacts with the back end system, but was developed and built separately in 1998. The online services system was designed in house, rather than using an off-the-shelf product; however, the DMV does use a mix of third-party and in-house products for software and security measures.

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<sup>15</sup> [http://www.archives.nysed.gov/a/nysaservices/ns\\_mgr\\_laws\\_acal5705.shtml](http://www.archives.nysed.gov/a/nysaservices/ns_mgr_laws_acal5705.shtml).

<sup>16</sup> New York State Vehicle and Traffic Law §201.

The Department of Motor Vehicles Online Services site operates on technical infrastructure policies developed under the Electronic Signatures and Records Act (ESRA) of 2002.<sup>17</sup> All policies related to the implementation of Public Key Infrastructure (PKI) must operate in conformance to the Internet Engineering Task Force Public Key Infrastructure X.509 (IETF PKIX) Part 4 Certificate Policy and Certification Practice Statement Framework and the ESRA act.

Private information is ensured using Secure Socket Layer (SSL) technology in conjunction with VeriSign services. VeriSign verifies the DMV Online Services as a legitimate business for the customer.

Citizens wishing to conduct business transactions with the DMV have information automatically collected upon visiting the Online Services Web site.<sup>18</sup> As listed on the Web site:

When visiting this Web site the New York State Department of Motor Vehicles automatically collects and stores the following information about your visit:

- (i) User client hostname. The hostname or Internet Protocol address of the user requesting access to a state agency Web site.
- (ii) HTTP header, "user agent." The user agent information includes the type of browser, its version, and the operating system on which that the browser is running.
- (iii) HTTP header, "referrer." The referrer specifies the Web page from which the user accessed the current Web page.
- (iv) System date. The date and time of the user's request.
- (v) Full request. The exact request the user made.
- (vi) Status. The status code the server returned to the user.
- (vii) Content length. The content length, in bytes, of any document sent to the user.
- (viii) Method. The request method used.
- (ix) Universal Resource Identifier (URI). The location of a resource on the server.
- (x) Query string of the URI. Anything after the question mark in a URI.
- (xi) Protocol. The transport protocol and the version used.

None of the foregoing information is deemed to constitute personal information.

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<sup>17</sup> L.2002, c. 314, § 1, provides: "Legislative intent. Article I of the state technology law, known as the Electronic Signatures and Records Act (ESRA), is intended to support and encourage electronic commerce and electronic government by allowing people to use electronic signatures and electronic records in lieu of handwritten signatures and paper documents. Subsequent to the adoption of ESRA, the federal Electronic Signatures in Global and National Commerce Act (> 15 U.S.C. §§ 7001-> 7006), known as the ESign Law, was adopted to permit and encourage the expansion of electronic commerce in interstate and foreign commercial transactions."

<sup>18</sup> The DMV does not deem any of the following as personal information. <http://www.nydmv.state.ny.us/securitylocal.htm>.

The information that is collected automatically is used to improve this Web site's content and to help the New York State Department of Motor Vehicles understand how users are interacting with the Web site. This information is collected for statistical analysis, to determine what information is of most and least interest to our users, and to improve the utility of the material available on the Web site. The information is not collected for commercial marketing purposes and the New York State Department of Motor Vehicles is not authorized to sell or otherwise disclose the information collected from the Web site for commercial marketing purposes.

The DMV Web site uses “cookies,” which are simple text files placed on the user’s computer to distinguish it from other users. The DMV occasionally uses “session cookies,” which helps customize the Web site or transaction to the users needs. Cookies are merely used to enhance the user’s experience.

## **D. Narrative Answers to the 23 Core Research Questions**

### **1. What activities of the creator have you researched?**

As a records creator, the New York State DMV’s mandate encompasses many activities. However, the investigation was limited to activities connected to the DMV’s On-line Services system. Specifically, researchers investigated customer transactions completed via that system, such as license and registration renewal and replacement.

### **2. Which of these activities generate the digital entities that are the objects of your case study?**

Researchers investigated customer transactions completed through the On-line Services system, such as license and registration renewal and replacement.

### **3. For what purpose(s) are the digital entities you have examined created?**

In general, DMV record requirements are mandated by New York State law to regulate drivers and their vehicles. They are also used to create the following types of paper records in association with the electronic records:

- The digital entities are used to create paper documents, a driver’s license, registration, or title, given to an individual to prove a certain legal status, such as their right to operate a motor vehicle or their ownership of a certain motor vehicle.
- The digital entities are also used to create another class of paper records called abstracts. These show not only the current status of a file, but also contain the relevant history of that record. For instance, the abstract would show if a driver’s license had been suspended in the past. An abstract could be used by an individual (e.g., as evidence of a clean driving record). Also, third party users, such as attorneys, insurers, and banks, access digital abstracts of DMV records. For example, a certified version of an abstract

would be used in court to determine the status of a driver at the time of a specific incident.

#### **4. What form do these digital entities take?**

The digital entities exist as files in a database in the DMV's core mainframe system, which interfaces with the On-line Services system. Each file, such as a driver's license file or a registration file, contains data on the current status of a driver or vehicle, as well as an audit trail that contains information about all past transactions connected to that record. The audit trail is arranged by the date and time of each transaction and also by category. As stated under question 3, these digital entities are used to produce paper records, both official documents and abstracts.

##### **4a. What are the key formal elements, attributes, and behavior (if any) of the digital entities?**

The records are live records and have the ability to change over time. They can be placed into a status where they are no longer alterable, as when a driver dies or a vehicle is junked. The official records have an official crest or logo on them and are printed on watermarked paper.

##### **4b. What are the digital components of which they consist and their specifications?**

The certified record originates from the official office. The electronic access for the public is stream data that is usually presented on a display.

##### **4c. What is the relationship between the intellectual aspects and the technical components?**

The DMV uses data schema extensively, but the respondents were unwilling to share any details about how they were deployed. Watermarks are used. PKI infrastructure, VeriSign authorization, and digital signatures are used to enable secure transaction.

##### **4d. How are the digital entities identified (e.g., is there a [persistent] unique identifier)?**

There is a unique identifier connected to each transaction. The transaction and its identifier are stored with the core record, as a result of the transaction. Different sets of identifiers exist for each of the three file types: license, registration and title.

##### **4e. In the organization of the digital entities, what kind of aggregation levels exist, if any?**

The DMV does not use directories or subdirectories, but keeps everything in tables and databases. The individual transactions in the audit trail are organized by date and time, category and current status.

##### **4f. What determines the way in which the digital entities are organized?**

All digital entities are organized so that they reflect the record creating process. Date, time, and individual are the core elements that make the organization of the digital entities.

## 5. How are those digital entities created?

The digital entities are created by customers using the New York State Department of Motor Vehicles On-line Services. Customers have nine services from which to choose: Social Security Verification, vehicle registration (Figure 2), driver licenses, schedule a road test, custom plates, title certificates, inspection stickers, provide proof of insurance and E-Z Pass. However, before any online service can be performed by a customer, a core record must exist for that customer. A core record is a record created for each individual DMV customer, containing information that uniquely identifies each customer. While DMV could not reveal the structure of their core records, it can be assumed that vital information such as name, address, social security number and birth date are elements included in the core record. All customer transactional information is connected to a core record. Core records can be created by authorized DMV personnel only during an in person office visit. Thus, they cannot be created using the online system.

Once a core record exists for a DMV customer, that customer can perform any of the aforementioned nine online services. The digital entities are created from these services and become associated with the corresponding core record of that customer.

New York State DMV - Internet Office Transactions

### Renew a Vehicle Registration

#### Step 2: Verify the Information About Your Vehicle

Vehicle Plate Number: **D554XR**  
 Make of Vehicle: **AUDI**  
 Model Year of Vehicle: **1991**  
 Registration Renewal Fee: **\$ 47.50**

**Before you continue**, verify that the vehicle information that appears above is correct, then complete the required certification that appears below.

**Certification:**

I certify: (1) that the registration information presented is true; (2) that the registration is not currently under suspension or revocation; and FOR VEHICLES ONLY (3) that the vehicle is fully equipped, has been inspected, and will be operated in accordance with the requirements of the Vehicle and Traffic Law; and (4) that appropriate insurance coverage is in effect. If this vehicle has a gross weight of over 10,000 lbs. and is used either in a commercial enterprise or to transport hazardous materials, I declare knowledge of Federal and State Motor Carrier Safety Regulations and, if applicable, Hazardous Materials Regulations.

☒ **I agree to the above certification. (REQUIRED)**

[Go to the Payment Form](#)

**Instructions for Step 2:**

Make sure that the vehicle information that is displayed on this page (the vehicle plate number, the vehicle make, and the vehicle model year) matches the vehicle information that is displayed on your [registration documents](#).

**If the vehicle information is correct...**

- Read the certification statement. If you understand and accept the certification, use your mouse cursor to enter a checkmark in the checkbox. This certification is required.
- To continue this transaction, use your mouse cursor to click on the button that displays the words "Go to the Payment Form".

**If the vehicle information is NOT correct...**

- If the vehicle information on this page does not match the information on your registration documents, verify the information that you entered in Step 1, and make any necessary corrections. Use the toolbar or the menu on your browser to return to Step 1 and verify your entries. Make the necessary corrections, and use your mouse cursor to click on the button that displays the word "Continue."

Figure 2. Vehicle Registration verification page.

### 5a. What is the nature of the system(s) with which they are created? (e.g., functionality, hardware, peripherals, etc.)

Two systems are used to create, maintain, update, and manage electronic records within the New York State Department of Motor Vehicles: a mainframe system and a Web-based

interface. The mainframe system was originally developed in the 1960s, and has since been modified. It is used for the creation, maintenance and management of core records. Core records are those created by authorized Department of Motor Vehicle personnel and serve as the unique, primary record for each customer. Unlike a driver's license or vehicle registration, core records do not expire. Only authorized DMV personnel can create core records; they can not be accessed or modified by customers using the online system. All other records and transactions are associated with and tied to the core record. Each customer may have one or more files connected with their core record. A separate file exists for each form of documentation that a person might have (e.g., a driver's license file, vehicle registration file, and vehicle title file). In addition, there is also an audit trail, which records all changes made to the record, connected to each record.

The Internet accessible On-line Services system is a stand-alone system that interacts with the mainframe system. The Web-based system was built separately and operates independently, but communicates with the mainframe system. The system connects with the mainframe system in order to access and update records. It does not modify the information of the original core record, but it does have the ability to access core records and to modify or add information to a customer's files. For instance, the Web-based system connects with and accesses the mainframe system's core records as part of the process of confirming the identity of a customer who wants to complete an online transaction. The online transaction then results in a modification of one of the customer's files and updates the audit trail that is associated with the customer's record.

**5b. Does the system manage the complete range of digital entities created in the identified activity or activities for the organization (or part of it) in which they operate?**

As indicated in the previous question, the DMV operates two systems. Although the mainframe and standalone Web-based system are administered separately, they often communicate with one another and function as one to carry out business functions. All electronic records created using the Web-based system become part of the files that are tied to the user's core record, and are stored and managed by the mainframe system. The Web-based online system manages only Web-based transactions; it does not manage records created by those transactions.

The DMV respondents felt that their system managed the complete range of entities created during the activities. In addition to managing the records created by the online transactions, the system also employs user logs to track changes made by DMV personnel. When customers send an e-mail to the DMV, they are directed to a special form, which the system tracks, as well as who responded to it, and the response.

**6. From what precise process(es) or procedure(s), or part thereof, do the digital entities result?**

In creating the digital entity, the customer begins by accessing the New York State Department of Motor Vehicle On-line Services system through the Internet<sup>19</sup> and selects a service. Once a

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<sup>19</sup> <http://www.nydmv.state.ny.us/>.

service has been selected, the customer must provide proof of identity by entering information, which is confirmed by the DMV by comparing the entered information with that of the corresponding core record. Next, the customer is presented with a process related to the service they selected, such as renewing a driver license, for example. Upon the successful completion of that process, the customer may be required to pay for service. Payment is transmitted and delivered in a manner similar to other Web-based commerce (Figures 3 and 4). Finally, the customer receives an onscreen confirmation that the transaction was successful, followed by an email confirmation. If the customer is to receive a new document as a result of the transaction, it is sent by mail. In the simplest terms, the creation process is as follows: selection of online service, proof of identity, transaction process, payment, and confirmation. There are, however, some services that do not require a payment, such as vehicle plate mailing status and title certificate or lien status.

Digital entities are also created from off-line processes. DMV electronic records are also created as byproducts of paper forms. Customers complete selected forms for specific services/functions (e.g. renewing a driver license) during an in-person office visit. The completed forms are then submitted to a DMV customer service representative, who in turn enters the information into the DMV database. A digital entity results from this latter step. One prominent example of this process is applying for a first New York State driver's license. A customer must apply for their first driver's license issued by New York in person, they can not apply online.

**7. To what other digital or non-digital entities are they connected in either a conceptual or a technical way? Is such connection documented or captured?**

As mentioned earlier, during online transactions, the online system connects to the mainframe system in order to compare information with that stored in the core record and in order to update information in the files connected to the core record. Thus, all online service activity is associated with a corresponding core record, both conceptually and technically. In addition to those digital records, the digital entities created through the On-line Services system are also connected both conceptually and technically to non-digital paper records.

Many of the digital entities created using the online system result in non-digital entities that are conceptually connected to the digital entity. For example, a license or registration renewal performed online will not only result in updating the digital record of that customer, but the customer will also receive a physical document that serves as a manifestation of the transaction. In addition, the DMV creates paper records called abstracts that show the current status and history of a custom's digital file. Both the documents and the abstracts are technically tied to the digital entities as the information printed on them is taken from the digital files.

Another type of non-digital entity is created during onsite visits to DMV locations, which are conceptually but not technically linked to the digital records. During an onsite visit, customers complete paper forms, which they turn over to DMV personnel. While the information on the form is entered into the mainframe system and becomes a digital entity, the paper form is also retained as part of a physical file. If and how these paper records might be used was not discussed during the interview.


New York State DMV - Internet Office Transactions

## Renew a Vehicle Registration

### Step 3: Enter Your Payment Information and Submit Your Order

Vehicle Plate Number: **D554XR**  
Registration Renewal Fee: **\$ 47.50**

#### Credit Card Information



Type of credit card:

Account number:  
Enter numbers only. Do not enter spaces or hyphens.

Expiration date:  
 Month:  Year:

Name of Cardholder:  
Enter your name exactly as it appears on your credit card.

Zip code:  
Enter the zip code of your billing address.

#### Instructions for Step 3:

To complete your order:

1. Enter your [credit card information](#).
2. Enter a valid [e-mail address](#) in the correct format.
3. Click the button that displays the words "Submit My Order".
4. **Wait for the confirmation message.**
5. **Record your order number!**

#### Credit Card Information:

Provide the information from the credit card that you use to pay for your transaction. Enter all of the following information:

- **Type of Credit Card:** Select your type of credit card from the drop-down menu. The DMV accepts only the cards that are listed.
- **Account Number:** Do not enter spaces, hyphens, or punctuation marks.
- **Expiration Date:** Use your mouse cursor to select the month and the year that your credit card expires from the two drop-down menus.
- **Cardholder Name:** Enter your name exactly as it appears on your credit card.
- **Zip Code:** Enter the Zip Code of your billing address.

Figure 3. Payment Page 1.

Zip code:  
Enter the zip code of your billing address.

#### E-mail Address

You must enter a valid e-mail address in the correct format (myname@xyz.com) so that the DMV can send you a confirmation of this transaction. Verify your e-mail address before you submit your order.

**If you need help, read [the information about e-mail addresses](#).**

Your e-mail address:  
You cannot enter more than 45 characters.

#### Submit Your Order

Use your mouse cursor to click the button that displays the words "Submit My Order".

**Important!** - Do not click this button more than one time. Your order is not processed faster if you click the button more than one time. Wait until you see the confirmation message, and then record your order number.

**If you used a public computer**, make sure that you close the browser when you finish. Another user can use your credit card information if the browser is open.

- **Cardholder Name:** Enter your name exactly as it appears on your credit card.
- **Zip Code:** Enter the Zip Code of your billing address.

#### E-mail Address:

You must enter a valid e-mail address in the correct format (myname@xyz.com) so that the DMV can send you a confirmation of this transaction. You can not enter more than 45 characters. Verify your e-mail address before you submit your order.

If you enter your e-mail address incorrectly, the DMV cannot send you an e-mail message to confirm your order.

To see examples of common errors related to e-mail addresses and for other help, read [the information about e-mail addresses](#).

[Return to the Top of this Page](#)

Figure 4. Payment Page 2.

**8. What are the documentary and technological processes or procedures that the creator follows to identify, retrieve, and access the digital entities?**

The creator of the records is the DMV system. The customers provide and input the information for an online transaction, or DMV representatives input the information for off-line transactions, but the creator of the records is the system.

**Identify**

All transactions are assigned a unique identifier. The unique identifier is associated with the transaction. There are separate sets of identifiers for the three types of digital files (license, registration, and title) connected to a customer's core record. So, the unique identifier for all transactions is linked to the core record of the customer responsible for initiating the transaction.

**Retrieve**

Transactions and core records can be retrieved on the DMV secure intranet only by authorized personnel. All transactions, including the retrieval of a record or transaction, are recorded using audit trails. Audit trails can be viewed online or printed as paper reports. Customers using the On-line Services system have access only to transactions; they cannot access or retrieve the digital entities directly through that system. They can, however, use another transaction option available on the online system to request a paper copy of their record.

**Access**

Internal access to core records and their associated transactions is available to authorized DMV personnel only. As mentioned above, driving record abstracts, replacement titles, replacement licenses, etc. can all be ordered through the On-line Services system, but the customer does not have access to the digital files on the mainframe. If a customer has difficulty with an online transaction, they can query the DMV by e-mail (an e-mail form is provided for just this situation). The DMV will assign the transaction a reference number, which will allow the customer and DMV representatives to access the transaction. A limited type of external access is permitted for select third parties who have a relationship to the customers, such as banks, insurers, and attorneys. This type of access will be discussed below in question 14.

**9. Are those processes and procedures documented? How? In what form?**

The process and procedures are documented in several ways: by audit trails, user logs, e-mail confirmation and end user deliverables. Transactions, whether they are initiated by a customer or by a DMV representative, are captured by the Web-based system and then incorporated in the core system (database) or kept on a separate file system away from the core system. Each transaction is assigned a unique identifier and can be tracked using that identifier. Although the DMV does not use a CRM system that ties the various digital entities (audit trails, user logs, email records, etc) together, they can manually connect them if needed. For example, if DMV staff request information on how a core record changed over time, they would be able to manually generate a report by querying the core system along with a separate file system that keeps snapshots of all the changes and audits to a record.

Paper reports are generated for the audit trails and user logs. It was reported that there is no specific criteria outlining the duration the reports should be kept and maintained; therefore, they are being kept indefinitely. Thus the audit trails and user log reports have been kept since the introduction of the On-line Services system in 1998.

On the user end, documentary evidence of the processes and procedures of transactions is sent to the customer, in the form of onscreen and email confirmation and paper documents, e.g., driver license, vehicle registration or titles.

**10. What measures does the creator take to ensure the quality, reliability and authenticity of the digital entities and their documentation?**

Since the majority of the DMV's digital entities are live records, they must remain open to change. Two groups have the ability to alter the digital entities. Authorized DMV personnel can alter records directly and customers can modify records indirectly by completing transactions on the On-line Services system. User logs and audit trails track all transactions and changes made by both employees and customers, so that records cannot be modified without leaving behind evidence of that modification.

The DMV also limits what type of access each employee has to the digital entities. Not all DMV employees have the same level of access; some employees can only view the digital entities while others can make changes. The level of access depends on job needs. Very few employees have the ability to delete any records, a process that is almost never done.

During online customer transactions, there is a confirmation process that compares the identification information entered by a customer with his or her core record. If there are discrepancies between the identification information being entered and the customer's core record, the transaction will not be completed. Third parties, such as Verisign, are not used in the confirmation or authentication process.

The reliability and authenticity of online transactions are ensured through the use of IP addresses, system dates, and session cookies.

Electronically transmitted digital entities are sent using Secure Socket Encrypted Transactions and authenticated through the use of digital watermark. Paper documents are printed on special paper that employs watermarks, logos, and official crests as means of authentication.

**11. Does the creator think that the authenticity of his digital entities is assured, and if so, why?**

The DMV is assumed to be the creator of the digital entities.

**Core Records**

The DMV interviewees did not explicitly articulate how the authenticity of core records was assured, only that the system was secure. They were reluctant to reveal information related to the security of their mainframe and database. However, it was stated that the Deputy Commissioner

for Operations is responsible for the accurate creation of these core records. While the core system is live and thus always changing, the history and information of old transactions are not kept there. They must be recreated combining records from a separate backup file system and the core system.

### **Online Transactions**

Once the confirmation and payment processes have been completed, the DMV deems the information to be authentic. The DMV matches the identification information provided by the customer during the online transaction with the identification information in the core record file of that customer. If the two match, the information is assumed to be authentic. Before customers can commence an online transaction, for most activities, they must be mailed a code to allow them to complete the transaction online.

Authenticity is further ensured during the payment process. The information provided by the customer is compared with the credit card company's records. To do this, the DMV uses an internal system that communicates with the credit card company. The credit card company ensures that that information is authentic.

Online customers have access to only transactions, not the digital entities or core record files. Therefore, the DMV felt "99% sure" their records were not accessible externally. Because of this high confidence level, they also felt their records could not be compromised.

### **During Transmission**

An image of the digital entities, such as driving records and registrations, can be transmitted electronically using Secure Socket Encrypted Transactions. These images are digitally watermarked and only the paper copy is owned by the recipient. These records are used by lawyers, such as district attorneys, and are admissible in a court of law.

## **12. How does the creator use the digital entities under examination?**

The DMV is responsible for regulating motorists and their vehicles in New York State. The digital entities under examination are used to aid in carrying out that mission. The DMV uses the digital records to produce documents for customers that establish their right to operate vehicles and prove their ownership of specific vehicles. The DMV also uses the digital entities to print paper versions of the digital files called abstracts that indicate a customer's current status and history. These abstracts can be employed either by customers for personal use or by lawyers in court as evidence.

As mentioned above, the DMV uses the core record files for a specific purpose during the confirmation phase of all online transactions. Customer identification information entered during online transactions is compared with the corresponding core record of the customer.

## **13. How are changes to the digital entities made and recorded?**

A majority of the digital entities examined are live records and thus subject to change. Customers can make certain limited changes to only their own records via the On-line Services system. They do not have the ability to change their core records or to delete records. Before

customers can complete any transaction that might lead to a change in their record, they must proof their identity by providing personal information that matches their core records. DMV personnel also have the ability to change records. In order to enter the system they must complete a login process. All changes to the digital entities, whether made by customers or employees, are recorded by means of audit trails and user logs. These tools record the nature of the change, the date and time, who made the change, and whether it was an online transaction or completed through the DMV's own system.

**14. Do external users have access to the digital entities in question? If so, how, and what kind of uses do they make of the entities?**

There are two groups that have external access to the digital entities. The first group is comprised of customers, who have access through the On-line Services system. As discussed above, customers have no direct access to the core records, but by completing transactions online they can modify their own digital files and can request paper copies of their record.

The second group of external users is made up of individuals or businesses who have a third part relationship to customers represented in the digital entities, such as banks, insurance companies and attorneys. Each third party user sign a notarized user agreement stating that they will abide by a set of business rules and that they will limit their usage to stated purposed. In exchange, each external user receives a log-on to a system that provides them with electronic displays of records. These electronic records are transmitted using a Secure Socket Layer (SSL). District attorneys use this system to print watermarked paper representations of the records that are then used in court.

**15. Are there specific job competencies (or responsibilities) with respect to the creation, maintenance, and/or use of the digital entities? If yes, what are they?**

All DMV employees are part of New York State civil service. The Department of Civil Service sets minimum requirements and administers examinations for jobs.<sup>20</sup> The DMV respondents did not mention any specific competencies required for new hires beyond basic computer literacy. They indicated that extensive training is given to all personnel who have access to the digital entities.

**16. Are the access rights (to objects and/or systems) connected to the job competence of the responsible person? If yes, what are they?**

Access to records is not directly based on an individual's civil service title, however; the DMV hires people with specific skills, which translate to their civil service title and that is place to start when assigning access rights. The bottom line is that access is based on business or job need. Employees have access to as much information as they require to sufficiently complete their job.

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<sup>20</sup> <http://www.cs.state.ny.us/>.

**17. Among its digital entities, which ones does the creator consider to be records and why?**

The DMV considers the three types of files, (license, registration, and title) stored on the mainframe system, to be the records. And, those files are considered to be the records from a legal standpoint and are what are used in court. For use in court, the files are always reproduced in a paper format as an abstract, a certified record produced on watermarked paper.

**18. Does the creator keep the digital entities that are currently being examined? That is, are these digital entities part of a recordkeeping system? If so, what are its features?**

All the digital entities being examined are kept by the DMV in their mainframe system. The Vehicle and Traffic Law provides guidelines and retention schedules for these records.<sup>21</sup> Some records may be moved to another medium and kept longer than the Vehicle and Traffic Law's minimum period; however, once the retention period has expired those records would be considered "legally unavailable." The DMV also uses Internet services logs to monitor access and use of its online services. In accordance with the New York State Arts and Cultural Affairs Law, these logs are kept for up to seven years, and then destroyed.<sup>22</sup>

**18a. Do the recordkeeping system(s) (or processes) routinely capture all digital entities within the scope of the activity it covers?**

Yes, the system captures not only the data submitted by the customer through the online transactions, but also retains any email, user logs, and audit trails associated with the digital files.

**18b. From what applications do the recordkeeping system(s) inherit or capture the digital entities and the related metadata (e.g. email, tracking systems, workflow systems, office systems, databases, etc.)?**

The system that the DMV uses captures IP addresses, system dates and session cookies. The cookies are used only to maintain the session state; they are not stored on the hard drive of the patron.

**18c. Are the digital entities organized in a way that reflects the creation processes? What is the schema, if any, for organizing the digital entities?**

As far as can be determined from the information provided by the respondents, the system does seem to organize records in a way that reflects the creation process. The digital entities are arranged as files (license, registration, and title). The audit trails that record past transactions and history are arranged by date and category. This organization reflects the different categories of forms a customer would fill out for transactions and the different kinds of documentation he or she would receive.

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<sup>21</sup> New York State Vehicle and Traffic Law §201, Section 3 "Electronically or mechanically stored records. Any electronically or mechanically stored record relating to: (a) certificates of title shall be retained for a period of seven years from the date of the issuance of the title plus an additional three consecutive years of inactivity regarding the titled vehicle."

<sup>22</sup> <http://www.nydmv.state.ny.us/securitylocal.htm>.

**18d. Does the recordkeeping system provide ready access to all relevant digital entities and related metadata?**

If the mainframe system is equivalent to the recordkeeping system, then the answer to this question is yes. While customers and third party users have access to only a small portion of the digital entities, the system provides DMV personnel with access to all aspects of the digital entities.

**18e. Does the recordkeeping system document all actions/transactions that take place in the system re: the digital entities? If so, what are the metadata captured?**

The recordkeeping system at the DMV tracks all changes to records in the mainframe system through audit trails and user logs.

**19. How does the creator maintain its digital entities through technological change?**

The DMV's core system has not experienced a transition or conversion during the tenure of the respondents. However, they were willing to speculate on what they would do based on what has been done during migrations to new technology. In these cases, the DMV duplicates all the records involved as well as the old software and stores them. The original records are then migrated to the new system. During the migration there is rigorous parallel testing. The DMV compares the old and new copies and also tests that transactions lead to the same outcomes in the new system as in the old. After the migration has been completed and tested, the old system is turned-off, and the new system becomes the functioning system. The duplicated records are retained for an unspecified period of time, at least until the DMV is assured the new system runs effectively.

**19a. What preservation strategies and/or methods are implemented and how?**

Backups of all the records are made and kept at a separate location for security and disaster recovery; however, there was no feeling among the respondents that anything was being preserved long term or for historical purposes. The lack of preservation techniques may be tied to the short retention periods mandated for the records in the New York Vehicle and Traffic law.<sup>23</sup> Many records must only be retained for a year or two after the expiration of the document in question. Therefore, few of the DVM's records appear to be kept for a long period after they become inactive. The respondents stated that some inactive records are moved to a new medium for storage, but if the time period given in the retention schedule had elapsed, these records are considered "legally unavailable," even though they might still be in the DMV's possession.

**19b. Are these strategies or methods determined by the type of digital entities (in a technical sense) or by other criteria? If the latter, what criteria?**

N/A

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<sup>23</sup> New York State Vehicle and Traffic Law §201.

**20. To what extent do policies, procedures and standards currently control records creation, maintenance, preservation and use in the context of the creator's activity? Do these policies, procedures and standards need to be modified or augmented?**

As a component of New York state government, the DMV is obligated to comply with numerous policies and standards.

**Creation and Use**

Policies affecting the creation and use of the DMV's records include the New York State Cyber Security and Critical Infrastructure Coordination (CSCIC) policy, the New York State Accessibility Policy, the Driver's Privacy Protection Act, the Vehicle and Traffic Law, the Freedom of Information Law, the Personal Privacy Protection act, and the Electronic Signatures and Records Act. The DMV's On-line Services system must also comply with regulations established by the credit card companies.

The DMV is also subject to a large number of its own internal policies and standards. While the DMV respondents were not willing to provide documentation of their various policies, they did discuss their procedures for adding new transactions to the system. Every new or proposed transaction, substantial enhancement and/or substantial modification undergoes a security review. The Cyber Security and Critical Infrastructure Coordination (CSCIC) policy is always consulted and it is compared with their knowledge base of what can go wrong, in terms of privacy. It is reviewed by several key DMV personnel, reviewed by the audit department, and then undergoes a rigorous review to make sure that it conforms to policies and laws.

**Maintenance and Preservation**

The DMV records are retained based on the retention schedule provided in section 201 of the New York state vehicle and traffic law. The respondents did not believe that there were any other policies or standards that influence the maintenance of the records in their mainframe system. Information collected by the On-line Services system Web site follows the retention and disposition policies set by the New York State Arts and Cultural Affairs Law.<sup>24</sup>

**21. What legal, moral (e.g. control over artistic expression) or ethical obligations, concerns or issues exist regarding the creation, maintenance, preservation and use of the records in the context of the creator's activity?**

Legally, the DMV is required to comply with a number of state and federal policies. These include the New York State Vehicle and Traffic Law, the New York State Internet Security and Privacy Act, the Freedom of Information Law, the New York State Cyber Security and Critical Infrastructure Coordination (CSCIC) policy, the Electronic Signatures and Records Act, and the Driver's Privacy Protection Law. These laws are described above in Section C, juridical-administrative context. The DMV also has numerous internal policies and standards that were alluded to during the interview process but not explicitly described. Moral and ethical obligations were not mentioned or alluded to during the interview.

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<sup>24</sup> [http://www.archives.nysed.gov/a/nysaservices/ns\\_mgr\\_laws\\_acal5705.shtml](http://www.archives.nysed.gov/a/nysaservices/ns_mgr_laws_acal5705.shtml).

**22. What descriptive or other metadata schema or standards are currently being used in the creation, maintenance, use and preservation of the recordkeeping system or environment being studied?**

The DMV respondents were asked if they would provide any data entry, user manual or instructions about how they create specific outputs and information about metadata structure and content, such as a data elements dictionary, data layout, DTD and tag library. They indicated that they do have layouts and schema; however, they did not feel comfortable revealing that information to the InterPARES research team.

**23. What is the source of these descriptive or other metadata schema or standards (institutional convention, professional body, international standard, individual practice, etc.?)**

The source of these standards was not mentioned or discussed during the interview. This would be a suitable topic for a follow-up in interview.

## **E. Narrative Answers to Applicable Domain Research Questions**

### **Domain 1 Research Questions**

#### **1.1 (a) What types of documents are traditionally made or received and set aside (that is, created) in the course of artistic, scientific, and governmental activities that are expected to be carried out on-line?**

The New York State Department of Motor Vehicles creates documents in the course of business in these activities:

- Renewing or replacing a driver's licenses
- Renewing or replacing a vehicle registration
- Replacing a title certification
- Ordering a driver's record abstract
- Paying fees
- Ordering personalized license plates
- Scheduling a road test

#### **(b) For what purposes?**

Their purpose is to comply with New York State and United States Federal law.

#### **(c) What types of electronic documents are currently being created to accomplish those same activities?**

Digital watermarked documents, database entries, paper documents, paper and digital abstracts of DMV records.

#### **(d) Have the purposes for which these documents are created changed?**

No, the online system mirrors all the functions and processes that took place before the system was implemented.

#### **1.2 (a) What are the nature and the characteristics of the traditional process of document creation in each activity?**

All document generation is based on the transaction with the customer. So the activities or creating new documents and updated old ones does not differ greatly from traditional processes.

#### **1.5 As government and business deliver services electronically and enter into transaction cased on more dynamic Web-based presentations and exchanges of information, are they neglecting to capture adequate documentary evidence of the occurrence of these transactions?**

The DMV is unable to walk through the history of the various iterations of a record created. For example, they might be able to create a history of the changes to a record, but the not old records themselves, just the changes.

**1.6 Is the move to more dynamic ad open-ended exchanges of information blurring the responsibilities and altering the legal liabilities of the participants in electronic transactions?**

Some boundaries are being blurred in that the DMV must work with the Office for Technology, a branch that formerly had no involvement in administering DMV activities.

**1.7 (a) How do record creators traditionally determine the retention of their records and implement this determination in the context of each activity?**

The New York State Arts and Cultural Affairs Law determines the retention schedule for all records generated from transactions via the On-Line Services Web site. Electronic files are retained up to seven years.

**Domain 2 Research Questions**

**2.4 (a) On what basis can the records created in the course of each activity be presumed authentic?**

The DMV has standards and procedures in place to ensure authenticity of each transaction. The DMV uses IP authentication, system dates between client and server, and session cookies for every transaction.

**2.5 (a) How is the authenticity of these records affected by their transmission across space and time?**

The customer's personal information must agree with the information on the Core system, the online transaction will be ended if there is a conflict.

**(b) What controls on the process of transmission would ensure that these records will continue to be recognized as authentic?**

The DMV uses secure measures and methods for data back-ups and migration across time.

**2.11 What legal or moral obligations exist regarding the creation, use and preservation of the records under investigation?**

All new electronic records policies must undergo a security review using the Cyber Security and Critical Infrastructure Coordination (CSCIC). The DMV is obligated to follow the state and federal laws relating to freedom of information as well.

### **Domain 3 Research Questions**

#### **3.1 How do the appraisal concepts, methods and models developed by InterPARES 1 for the administrative and legal records created in databases and document management systems apply to the appraisal of the records of artistic, scientific and government activities resulting from the use of the technology examined by InterPARES 2?**

The DMV appraises administrative records, but they do not appraise driver's records since they stay in the live system until scheduled for destruction. Thus, the driver's records never become archival material.

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