

DIGIMARC

Driver License Agency: Nebraska

Pilot: Operational Pilot of Digital Watermarking Reading for Driver License Authentication and Traffic Enforcement Support



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– Beverly Neth
Director, Nebraska DMV

U.S. Department of Transportation and Nebraska Department of Motor Vehicles Situation

In our increasingly fast-paced, technologically-advanced, Internet-connected world, identity theft and fraud impact nearly all segments of our lives, from personal security to the threat of terrorist activity, to highway safety.

According to a 2006 Federal Trade Commission report, consumer complaints of identity fraud and theft increased 25% between 2003 and 2005¹, with total economic losses to consumers of approximately \$5 billion and a total cost to businesses of over \$48 billion.

The most recent statistics available from the FBI state that domestic terrorism cases increased from almost 3,500 in 1999 to more than 6,000 in 2003. A chilling FBI report² sites a case of a package intercepted by the FBI that contained half-a-dozen fake identity documents—all in different names but with the same picture—along with a stash of deadly chemicals and instructions on how to turn them into poison gases.

Finally, a recent report³ from the National Highway Traffic Safety Administration revealed that in 2004, 24% of drivers between the

ages of 15 to 20 who were killed in traffic crashes had Blood Alcohol Content levels of .08 or higher. While traffic crashes and fatalities are the most visible dangers of underage drinking, alcohol consumption by minors is also associated with increased rates of violence, suicide, unsafe sexual behaviors, fetal alcohol syndrome, and educational failure. The social cost of underage drinking has been estimated at \$53 billion; this total includes \$19 billion from traffic accidents and \$29 billion from violent crime. The monetary impact in terms of increased health risks and diminished prospects for future success are incalculable.

Any way you look at it, identity theft and fraud is a huge and ever-increasing problem. The reasons for the increase in identity theft and fraud and the use of false IDs can be directly attributed to current technology in digital imaging and printing, and the increased use of the Internet for information exchange and multimedia content sharing. High quality color printers and copiers have made false IDs easier than ever to fabricate, and the Internet provides ready access to hundreds of vendors who sell ready-made false IDs online. These two technological advancements have made it progressively more difficult to reliably authenticate IDs through simple visual inspection. Machine readable authentication at point-of-inspection has, thus, become essential to secure identity credentials.

To provide machine readable authentication and aid states in the fight against ID counterfeiting, fraud, and theft—whether by minors or adults—Digimarc developed the Digimarc® IDMarc™ digital watermarking security feature and began offering it to driver license agencies in 2002. Incorporated today in more than 25 million driver licenses, IDMarc is a covert, machine-readable digital watermarking feature that enables cross-jurisdictional “turn-key” reading and authentication of state-issued identity documents, including driver licenses. Read at the point of document inspection with commonly available scanners, IDMarc links together personal data and security features to ensure credential integrity and defend against falsified IDs from photo swapping and data alteration. IDMarc provides positive document authentication, age verification, cross-jurisdictional authentication, and forensic capabilities.

Under a 2004 grant from the NHTSA, Digimarc Corporation selected the Nebraska Department of Motor Vehicles (DMV) to take part in a pilot program—the “Operational Pilot of Digital Watermarking Reading for Driver License Authentication and Traffic Enforcement Support,” which was designed to provide, access, test, and validate new capabilities for authenticating driver licenses. The pilot included driver license inspection within retail, law enforcement, and DMV environments with the goal of enhancing traffic safety and driver license security through the use of digital watermarking in the State’s driver licenses.

Five operational scenarios, or vignettes, were fielded:

- In-Car Inspection for Law Enforcement
- Office Inspection (DMV, Police, Commercial Vehicle Weigh Station)
- Point-of-Sale Inspection
- Mobile Inspection for Civilian Use
- Mobile Inspection for Law Enforcement

Digimarc installed systems and trained users on each of the five vignette configurations. The digital watermark scanners were installed in a total of 18 point-of-sale sites, 30 office sites, and 35 law enforcement sites, and were used in “real time” for an average of 30 days. Of the total of 83 scanning devices deployed, 45 were mobile or hand-held units, and 38 were desktop units attached to PCs. At the conclusion of the pilot, Digimarc staff interviewed the users regarding their experience with and response to the digital watermarking technology.

Nebraska Overview

In years past, prior to the rollout of the state’s new digital driver license and enhanced issuance system, Nebraska—like many states—had to deal with a driver license that was easy to alter or duplicate. In fact, Police Officer Brian Ward joked about a training course he attended with a colleague from the Florida Division of Alcohol and Tobacco. The colleague commented, “I never knew there were so many people from the state of Nebraska,” in reference to the large number of fake Nebraska driver licenses he confiscated in Florida bars during spring break.

Nebraska’s goals for their new system were to bring the highest level of security and integrity to their state driver license and meet the governor’s challenge of providing the most secure driver license in the country. “The vision of the agency really is to focus on the customer, deliver a secure driver license, and provide the highest level of customer service possible,” said Beverly Neth, Director of the Nebraska Department of Motor Vehicles.

The development of Nebraska’s current driver license issuance system included input from a broad group of stakeholders, including; law enforcement, retailers, the Liquor Control Commission, State Patrol, and advocacy groups such as Mothers Against Drunk Driving (MADD) and Project Extra Mile. To gain approval for the system from the legislature, the team cited numerous advantages such as machine-readable technology for law enforcement and the ability for retailers to reliably determine if an individual was over the age of 21, as required by Nebraska policy on underage drinking laws. The pilot provided a means to prove out these benefits.

When the pilot opportunity came along, Director Neth saw it as a chance to accomplish two primary goals:

1. Add another level of security to Nebraska’s driver license that was cross-jurisdictional and would enhance public safety
2. Help retailers meet the State’s goals of controlling the sale of age-sensitive products while balancing the privacy of the ID holder

“Because of the type of information contained in the digital watermark, we saw this as truly a win/win situation,” said Neth. “The retailers wanted something they could point to that showed they went through a process to authenticate the card. Digital watermarking gives them that. We wanted something that was not going to provide a great deal of personal information to someone looking at or scanning the card.”

¹Consumer Fraud and Identity Theft Complaint Data, January – December 2005, Federal Trade Commission, January 2006

²Preventing Terrorist Attacks on U.S. Soil: The Case of the Wrong Package Falling into the Right Hands, FBI Press Room, Headline Archives, 04/09/04

³Traffic Safety Facts, Crash Stats, NHTSA, August 2005

With the Digimarc Digital Watermarking Technology Pilot Program, Nebraska became one of a growing number of states to implement IDMarc as part of its license issuance program. Today, more than 60 percent of the Nebraska licenses in circulation carry this digital security feature, and the Nebraska DMV has recently submitted a quote request to Digimarc to outfit 31 additional Nebraska DMV workstations with IDMarc. Nationwide, 16 other states are issuing or have committed to issue digital watermark secured identity documents, and 13 states have the feature currently in production.

IDMarc in Action

Portable IDMarc inspection devices were successfully deployed in patrol cars, with officers on foot, on the University campus, and at one truck weigh station. The liquor control portion included bars, nightclubs, restaurants, convenience, liquor and grocery stores, and one private enforcement service. Additionally, desktop scanners with IDMarc authentication technology were installed in municipal police department offices, in forensic laboratories, and in various offices of the Nebraska Department of Motor Vehicles.

In addition to in-car inspection of drivers and driver licenses, Nebraska police officers often patrol bars and nightclubs to check for heavily intoxicated people and underage drinkers. They also help to educate bar and package liquor store owners on how to spot a false ID. While visual inspection is somewhat effective for those already highly familiar with in-state driver licenses (such as police officers), it is less so for those less experienced or untrained in visually spotting fake IDs, or where visibility is limited, where staff are constantly distracted, or in validating out-of-state driver licenses not commonly seen by bar or retail sales staff.

In general, retailers of alcohol are desperate for methods that allow them to be certain they are selling only to customers who meet the legal criteria. One location where the pilot took place was Bill's Liquor Store in Kearney, NE. This liquor store had almost lost their license when it was discovered they had sold liquor to someone under the age of 21 who was later killed in a car crash. The driver license authentication pilot provided them with a means to rebuild their integrity and protect their license to do business.

As a part of the Digimarc Digital Watermarking Technology Pilot Program pilot, several bars and retail establishments were equipped with point-of-sale reader devices that allowed them to verify the information printed on a driver license—even an unfamiliar out-of-state driver license—against the information contained in

the digital watermark. By doing so, they were able to determine if a driver license was valid or not and which, if any, age-controlled products the DL holder was old enough to purchase. The scanner/reader devices proved invaluable in instantly determining whether or not the license presented was authentic, as well as validating the age of the DL holder.

Several retailers reported that just the public's knowledge they were using digital watermark scanning devices deterred people from trying to use fake IDs. This same phenomenon was reported by a private security company that was hired to use the hand-held readers to authenticate driver licenses at the Nebraska State Fair; it created a visible deterrent and helped to curb the number of underage drinkers disrupting the event.

When surveyed at the conclusion of the pilot program, 100% of the retailers in the program reported that the digital watermarking feature gave them confidence that the ID was authentic. And the most common "objection" noted was that the digital watermarking feature needs to be more prevalent, especially in environments where large numbers of out-of-state licenses need to be authenticated.

Inspection Process

For law enforcement scanning a driver license "in the field," the IDMarc Inspector Series software displays an indication of validity, an image of the card, and complete digital watermark data. If the digital watermark rating is "Valid," officers are then able to submit a National Crime Information Center (NCIC) inquiry by document number with query results displayed in the viewer. If the digital watermark comes back as "Invalid" or absent the officer or other authorized user can open an image file to view examples of watermarked cards currently in production.

In an office environment, the IDMarc software displays all of the above—that is, an indication of validity, an image of the driver license, and complete digital watermark data—as well as a reminder to match the ID photo to the ID holder. In the case of an invalid card, the reason for failure is displayed along with forensic data. If no digital watermark is found, the system offers users information on cards that are or are not watermarked. The driver license image and digital watermark data are logged for later use in reporting.

In retail outlets a small card scanner is placed at the checkout stand to acquire an image of the front of the driver license. This image is then analyzed through the checkout monitor for the digital watermark security feature. In addition to determining the validity of

the driver license, the user interface shows the age and birthday of the ID holder with symbols to illustrate which age-restricted products (cigarettes, alcohol, or lottery tickets) can be sold to the card presenter. If the ID holder is over 21, all three symbols are circled in green.



Results

Nebraska staff, operators, and officers all said the Digimarc IDMarc system exceeded all their expectations—and then some. “Digimarc really came in and gave a great deal of respect to the Nebraska DMV staff. The listened to our suggestions, our comments, and our thoughts,” said Director Neth. “I think they put together a fantastic system that when rolled out, stayed up... and has stayed up ever since.”

Overall, the responses of the test users to the digital watermark feature were positive, as shown in the chart below.

Of those point-of-sale retailers who used the system, 100% said that a valid read from the watermark gave them confidence that the DL was authentic. Those who said they would not purchase the hardware (18%) reported that “the technology is great” but that there are too many out-of-state driver licenses that are not digitally watermarked and cannot be scanned, which makes the device less useful to them. When more driver licenses have digital watermarks, retailers state they would be more likely to invest in the authentication hardware.

Law enforcement officials also reported 100% confidence that a valid read from the watermark meant the DL was authentic. Police officers who used the in-car portable device reported the system worked well and they liked the technology but using the scanners did not improve workflow because officers are experienced enough to visually authenticate most driver licenses. However, one respondent commented that they “like the idea of having a way to backup an officer’s visual inspection.” One area where the IDMarc proved especially effective in the officers’ eyes was in authenticating out-of-state licenses which they might not be familiar with; one officer stated he was able to authenticate the digital watermark on an out-of-state license from Minnesota.

The group of participants who used IDMarc scanners in an office setting also felt positive about the feature. Fully 100% of those surveyed reported that they believed the device was beneficial, that it gave them confidence that the scanned ID was authentic, and that they would use it in the future. The most common issue reported was a desire for better integration with other systems such as bar code readers.

Survey Question	Yes	No
Do you believe that the feature is beneficial to you?	92%	8%
Does the feature give you confidence that the ID is authentic?	97%	3%
Would you use this in the future?	97%	3%
Would you purchase hardware that uses the Watermark feature? (retail only)	86%	14%

About Digimarc

The evolving role of the driver license in the US market—from evidence of competency to a means of personal identification to a secure credential—the events of 9/11, and the rapid advent of the Internet information age have stimulated a demand for a level of security in today's state-issued driver license which will allow it to be used with confidence as the de facto standard for establishing citizen identity in the United States, as well as an obstacle to identify theft.

Digimarc remains dedicated and focused on delivering high-quality, secure driver license issuance solutions that provide citizen access to a growing number of services and privileges, such as: applying for a passport, authorization to operate a motor vehicle, boarding an airplane, or purchasing age-restricted products.

Digimarc secure driver license solutions enable states to deter counterfeiting, enhance traffic safety and national security, combat identity theft and fraud, and facilitate the effectiveness of voter ID programs. The company has partnered with state customers through every major transition in driver license systems—and has issued billions of credentials worldwide, including two-thirds of the states' driver licenses, and identification solutions for more than twenty countries. Digimarc is the only company in the world focused on meeting the unique and growing needs of today's driver license issuers.

IDMarc digital watermarking is rapidly being adopted by many jurisdictions in the US responsible for driver license issuance as the standard for cost-effective, multi-purpose reading devices that enable reliable, cross-jurisdictional authentication of driver licenses and IDs that are secured with digital watermarks. Reading applications span law enforcement, retail sale of age-controlled products, banking, and border crossing. Digital watermarking technology has been proven over the past decade in a variety of commercial products, and has been applied to various authentication and high security applications worldwide.

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