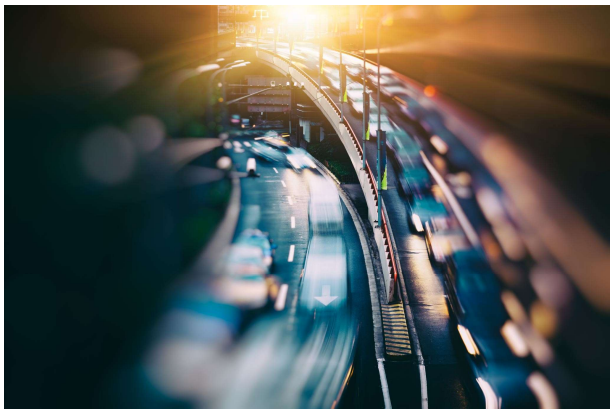

DIGITAL DRIVING PERMITS

Informal Document - Global Forum for Road Traffic Safety (WP.1)

September 2022

DIGITAL DRIVING PERMITS

This document provides an overview of digital driving permits, including its functionality and the problems it solves. This document also identifies the potential benefits to road safety and possible actions that can help realize these benefits

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Introduction

The Global Forum for Road Traffic Safety (WP.1) introduced the topic of digital driving permits as a part of the agenda for the 82nd (September 2019) session under agenda item 3 (b) for driving permits. During the 82nd session, The American Association of Motor Vehicle Administrators (AAMVA) gave a brief presentation on digital driving permits (also referred to as Mobile Driver Licenses). The presentation included an overview of digital driving permit functionality, benefits of the technology, long term vision for interoperable and sustainable solutions, and the potential role for WP.1 to play in the ecosystem. The delegates expressed interest in continuing discussion on the topic and digital driving permits became a regular agenda topic for the Working Party.

During the 83rd session of WP.1, the European Driving Schools Association (EFA) gave an update on current initiatives and achievements in Europe, including on the topic of digital driving permits. The Chair of the Working Party tasked AAMVA and EFA with exploring the creation of an informal group of experts on "digital mobile permits" and future common initiatives. The Working Party stressed the need for education on the topic and suggested a white paper on digital driving permits would be an appropriate starting point for this effort.

In response to that request, this document covers the following:

- Why digital driving permits came about
- Basic digital driving permit concept, and the global status of related initiatives
- Road safety benefits of digital driving permit use
- Why action in this area is needed sooner rather than later, and what can be done.
- Conclusion

Digital Driving Permits Have Arrived

Digital driving permits are the latest in credentialing technology and are not only real, but here to stay. For nearly a decade, experts from around the globe have been working to develop standards for digital driving permits that can be used to implement effective, secure, and interoperable solutions.

Why Digital Driving Permits?

One of the first questions everyone has is - Why the move to digital? What problem are we solving with this new approach to permits and identity?

In short, physical documents have been found wanting, and for several reasons. The remainder of this section delves deeper into these shortcomings. While there are several challenges, what follows below focuses on those that directly impact road safety.

Difficult to Authenticate

Physical credentialing technologies are sophisticated and offer secure features that can be added and used to authenticate permits. Issuing authorities around the globe have invested significant resources to ensure their driving permits are secure and trustable. Verifiers simply need to look for the appropriate security features on the permit to determine if it's genuine or not. Unfortunately, it's not as simple as it sounds. There are several factors that come into play and make the authentication of a permit challenging. For a verifier to properly inspect a credential they must first be aware of the different types of security features, meaning how they look, feel, and respond. Next, the verifier must also be aware of what features apply to the permit and to that particular

version of the design. In addition, the verifier will need tools or equipment such as a magnifying glass or ultraviolet light to perform an inspection. Finally, the verifier needs to have enough time to perform this inspection and most transactions are expected to be quick and easy. The overwhelming majority of verifiers do not have the education, resources, or time needed to complete a thorough inspection of the permit prior to accepting it.

Information Sharing and Interoperability Limitations

There are several limitations with driving permits that create challenges for information sharing and interoperability. These limitations create issues both within the jurisdiction, and across borders. Unfortunately, these issues can't be resolved within the scope of physical permits.

Card Real Estate

The standard permit that conveniently fits inside the holder's wallet may be ideal for carrying on the person but doesn't offer much space for data elements. The available real estate on the permit (in particular the front of the permit) is proving to be insufficient. Some people have long names that must be truncated or have more restrictions/endorsements than there is reserved space for. There are constantly new data elements or indicators that jurisdictions try to squeeze onto the permit for non-driving purposes to meet the needs of their public and law makers.

Languages and jurisdiction-specific data

Permits are often issued in the official language of the issuing authority. For most day-to-day interactions, this works perfectly fine as local verifiers would have no problems with reading and interpreting the data. However, when the permit holder travels across jurisdiction lines and to other countries, the official language of their home jurisdiction may not be consumable elsewhere without translation. This is true not only for language but also for data elements or codes that are not spelled out, or may be jurisdiction specific, such as vehicle class, endorsements, and restrictions.

Outdated Driving Privilege Information

As indicated above, permits are a snapshot in time offering information that was true at the time of their issuance. Changes in driving privileges cannot automatically be applied to a physical permit; for changes to be reflected an old permit must be taken in by the issuing authority and a new permit must be issued. This process often breaks down. As a result, a traveller could have their privileges suspended or revoked by the issuing country and another country in which they are operating a vehicle wouldn't have any way of knowing that the person shouldn't be driving.

What is a Digital Driving Permit?

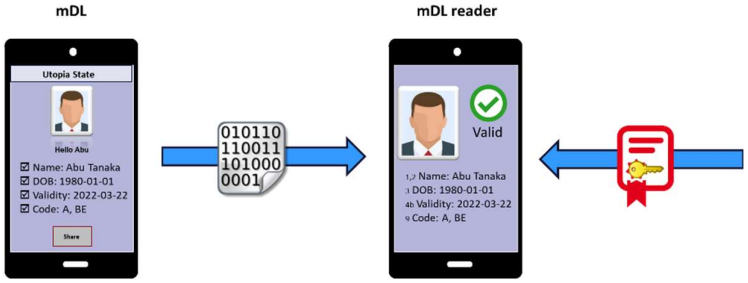
Overview

A digital driving permit (implemented in accordance with the ISO/IEC standard[1]) is a digital version* of the physical driving permit that is provisioned to a mobile device with the capability of being updated in real time. Digital driving permits consist of the same data elements that are used to produce a physical driving permit.

[1] ISO/IEC 18013-5:2021

Note: Legal experts recommend that the digital driving permit be considered an extension of the physical permit, meaning that the issuing authority continues to issue, and the holder continues to carry the physical driving permit, at least until such time that Digital Driving Permits are widely issued and accepted.

Once provisioned, a digital driving permit holder can selectively release data to a verifier. This occurs via a request-response protocol between the holder's mobile device and the verifier's reader device (which could be another mobile device). All holder information is shared via an encrypted channel. The reader device authenticates the information cryptographically using the issuing authority's public key (see the glossary for additional detail).



At transaction time, both the permit holder and permit reader can operate offline. The permit information is stored in a secure container on the holder's device and transmitted regardless of if there is no, or poor internet connectivity[2].

With digital driving permits there's no need for the verifier to handle, or otherwise touch the holder's device.

Non-compliant Digital Solutions

As explained above, a digital driving permit is electronically transmitted from the holder's device to a reader device, where it is cryptographically authenticated. Digital solutions that require the permit holder to 'show' a verifier their device to obtain information visually (flash pass concept, such as how physical credentials are shared today) do exist. However, such solutions carry significant risk and vulnerabilities for fraud and counterfeiting beyond what's seen today with physical permits, and cannot be classified as digital driving permits.

[2] In addition to the offline case, jurisdictions have the option to support an online model (referred to as server retrieval); however, jurisdictions considering this solution should carefully consider its privacy implications. It is mandatory for standard compliant solutions to support the offline option.

Global Status

Over the last few years, leading issuing authorities have become early adopters of digital credential technologies by way of exploratory efforts such as pilots, or by offering some form of digital product to drivers for use within their jurisdiction. With the publication of the ISO/IEC standard in 2021 and recent influences such as the COVID-19 pandemic, there is a rapid increase in interest and activity surrounding digital permits globally.

Data collected from issuing authorities worldwide (See Annex B: Global Status) bears this out. Figure 1 shows the breakdown of the digital driving permit activity for 56 Issuing Authorities. Almost all issuing authorities reported some level of digital driving permit activity.

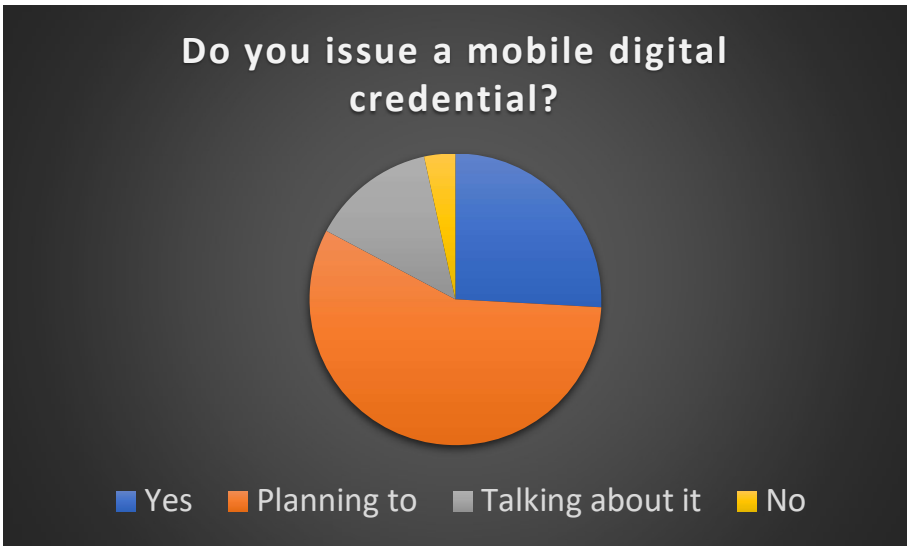


Figure 1: Issuing authority activity

Also notable from the data is the interoperability challenge:

- Many issuing authorities support ISO/IEC 18013-5. (Some issuing authorities mentioned using a QR code; this however is only a component of a digital driving permit solution, and no other digital driving permit standards were mentioned.)
- Some issuing authorities have built a domestic solution that is not interoperable with other issuing authorities. These issuing authorities largely fall into two groups: Those that recognize their digital driving permits will work only in their own jurisdiction, and those that envision interoperability through verifiers implementing issuing-authority specific solutions (i.e. verifiers implement each issuing authority's unique solution, one for each issuing authority whose digital driving permits they want to read and authenticate).
- Many issuing authorities are undecided on how to achieve interoperability, with quite a few mentioning ongoing discussions within the European Commission.

Benefits to Road Safety

Digital driving permits are designed to address the issues with physical permits described earlier. This section elaborates on how the shortcomings are mitigated or eliminated. The overall result is an improvement in road safety. A digital driving permit enables a verifier to fully understand the information, and to have confidence that the data is trustable, up to date, and comprehensive.

Trust and Assurance

Digital driving permits offer trust and assurance[3] through the use of cryptography. When issuing a digital driving permit, the issuing authority cryptographically signs the information. When transacting with a digital driving permit, the verifier uses the issuing authority's public key certificate to authenticate the permit information, thus confirming that the permit was issued by a legitimate issuing authority and that the data has not been altered since it was stored on the device. In contrast to physical permits, the result of the authentication process is a clear and quick Yes or No answer. In the road traffic law enforcement environment, where time is often of critical importance, a domestic driving permit thus frees up time the officer would otherwise have had to spend on trying to authenticate a physical document or documents, and it increases the officer's confidence in the authenticity of driving privilege information.

Translation of Data

Electronic data transmissions have many benefits, one of which is the ability to display/convert/translate/map information into something that is consumable, and easy to understand for the verifier. A digital driving permit is designed to be interoperable and ensure that the data being exchanged can be understood by any verifier with a complaint reader app. In addition, the reader apps have the capability to take the data received and put it into a particular language, unit of measurement, category of information etc. necessary to ensure the verifier understands the data they've received.

No space limitations

Digital permits don't have space limitations like we have with our physical permits today. With digital solutions, there is no need to truncate a name or limit the number of restrictions or endorsements that can be sent.

Data freshness

Digital driving permits were designed with maintainability in mind. To this end, an issuing authority has the capability to update a digital driving permit remotely. This means that changes to a person's driving privileges can be applied to a digital driving permit as soon as such changes are recorded in the issuing authority's systems. Verifiers such as road traffic law enforcement officers and rental car companies everywhere, including beyond the issuing authority's borders, can be confident that the driving privileges reflected in a digital driving permit are current.

Looking to the future

There undoubtedly are many new and novel ways in which digital driving permits will improve road safety in the future. One area being explored is interaction with a vehicle. For example, vehicles could act as a digital driving permit verifier and confirm that the driver is qualified to drive. There are also a host of future benefits that may indirectly support road safety. For example, rapid technological innovation means that drivers will be exposed to new vehicle features more often. Some of these features could require driver skill updates. Updating physical driving permits more often to reflect new skills will impose a burden on the issuing processes; updating digital driving permits is much more efficient and convenient. And although many interesting technical and policy

[3] The digital driving permit promise of improved document security based on digital counter-falsification measures is also recognized in the Commission Staff Working Document Evaluation of the Directive 2006/126/EC of the European Parliament and of the Council of 20 December 2006 on driving lciences, published on 21 January 2022 (SWD(2022) 17 final), as follows: "…digital transformation provides an opportunity to further improve document security based on digital counter-falsification measures [in digital driving licences]…".

challenges must be addressed to make this a reality, today's speed of change may make this happen sooner than expected.

Importance of Acting Now

Significant road safety benefits can be derived from the use of digital driving permits. However, there are also challenges to realizing these benefits. Delayed action on these challenges could delay achieving the expected road safety benefits of digital driving permits, or even result in some of the benefits never materializing. The main challenges, and how the Global Forum for Road Traffic Safety (WP.1) can contribute, are discussed below.

Legal Acceptance

Absent a global convention addressing the legal acceptability of digital driving permits between countries, countries have to fall back on the creation of bilateral agreements. WP.1, as the administrator of the Conventions on road traffic, is ideally situated to **address the legal acceptability of digital driving permits between countries**. A United Nations solution to this matter will help spread the road safety benefits of digital driving permits globally. The faster this occurs, the faster the benefits can be realized.

Operational Administration

Public key certificate administration is a further item that stands to benefit from prompt action. As explained earlier, a digital driving permit verifier needs an issuing authority's public key certificate to authenticate a digital driving permit. More specifically, it needs the public key certificate of all the issuing authorities whose digital driving permits it wants to authenticate. The verifier also needs to trust that all the keys it has belong to valid issuing authorities. Regional entities representing issuing authorities in North America, Europe and Australasia are already working on practical solutions to this challenge. Given the UN's very similar experience in administering public key certificates for passport issuers via ICAO[4], the UN's **involvement in collecting and disseminating public keys of digital driving permit issuing authorities** could be a way to harmonize digital driving permit administrative practices and interoperability, and to help spread the benefits of digital driving permits.

Technical Interoperability

Physical driving permits are consumed visually. Small differences in rendering usually do not cause a problem for verifiers. In contrast, digital driving permits are consumed by electronic means. Interoperability is achieved when both the issuing authority and a verifier follow the same technical standard and follow it exactly. Should an individual country (or approved third party) implement their own unique solution, there would be no interoperability with other countries. WP.1 is in a unique position to help prevent such fragmentation by **recognizing ISO/IEC 18013-5 as the common technical standard for digital driving permits[5]**. Given the speed at which countries are proceeding with digital driving permit initiatives, prompt action by WP.1 can help minimize market fragmentation and maximize interoperability.

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[4] The International Civil Aviation Organization (ICAO), is a specialized agency of the United Nations directed by 193 national governments as signatory states to the Chicago Convention (1944). Among other things, ICAO collects and disseminates public key certificates of electronic passport issuers.

[5] Given that technical standards in the mobile device environment evolve much faster than the conventions are updated, it may be prudent to recognize ISO/IEC 18013-5 outside the conventions. One possibility is to leverage the operational administration solution discussed earlier.

Conclusion

The authors of this document invite WP.1 to consider the following next steps:

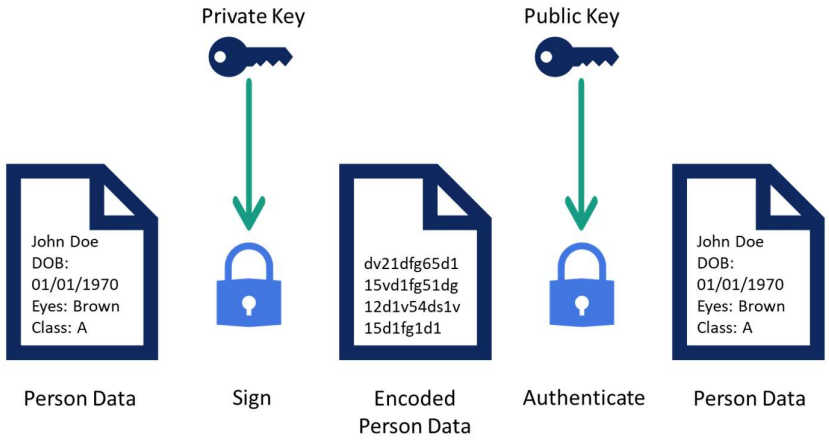
1. Alleviate the burden on individual countries to establish many bilateral agreements by addressing the legal acceptability of digital driving permits between jurisdictions.
2. Help harmonize digital driving permit administrative practices and interoperability, as well as the accessibility of digital driving permit authentication globally, by becoming involved in the collection and dissemination of the public keys of digital driving permit issuing authorities. For example, it could be helpful to consult with ICAO to better understand what it will take to become involved in the administration of cryptographic public keys.
3. Ensure interoperability by recognizing ISO/IEC 18013-5 as the common technical standard for digital driving permits.

Digital driving permits are fast becoming a reality. In the process of solving shortcomings of existing physical driving permits, digital driving permits will help to improve road safety. WP.1 is invited to offer comments and input to help unlock the road safety improvement potential of digital driving permits.

Annex A: Document Glossary

The following is a list of terms and abbreviations used in this document, and a description (for use within this document to ensure common understanding for readers).

Term/Acronym	Description/Explanation
authentication	The process or action of proving the digital driving permit to be true from a genuine issuing authority.
credential	Driving Permit or Identification card issued by the issuing authority.
data element	Any unit of data defined for processing is a data element (i.e. first name, address, height, license class etc.).
digital	Data represented using specific machine language systems that can be interpreted by various technologies.
digital driving permit	Driving permit that resides on a mobile device or requires a mobile device as part of the process to gain access to the related information.
electronic transmission	Any form of communication not directly involving the physical transmission of paper that creates a record that may be retained, retrieved, and reviewed by a recipient.
flash pass	The act of showing a physical driving permit and having it accepted by verifiers without an inspection of the permit to confirm its authenticity, OR The act of showing a digital representation of a driving permit on a mobile device (not supported by ISO standard).
interoperable	The capability of exchanging data via a common set of exchange formats, allowing mDL information to be shared between the mDL holder and the relying party.
issuing authority	Entity legally entitled to issue driving permits and identification cards within a country/jurisdiction.
ISO	International Organization for Standardization.
mobile device	A piece of portable electronic equipment that can connect to the internet (i.e. smart phone, tablet, or laptop).
digital permit app/holder App	Software running on a permit holder's device; this includes a standalone app as well as a wallet type app.
offline (also referred to as device retrieval)	Works without outside connectivity (for both the permit holder's device and the verifier's device) at the time the transaction takes place, thus requiring the permit data to reside on the permit holder's device.
online (also referred to as server retrieval)	Permit data is retrieved in real time directly from the issuing authority. ISO/IEC 18013-5 requires a mDL to support device retrieval and allows a device to additionally support server retrieval.
permit holder	Person to whom the driving permit is issued by the issuing authority.
permit reader	The device/software used to authenticate and retrieve the driving permit data from the permit holder's device.
private and public keys	Digital equivalent of a physical key. Keys come in pairs. When data is signed by one of the keys in a key pair, only the other key can be used to authenticate the data. In the case of a digital driving permit, the permit data is signed by the key held only by the issuing authority. This key (the "private key") is protected very securely to ensure that only the issuing authority can use it. The other key (the

	"public key") is distributed widely. Verifiers use the public key to confirm that (a) the permit data has not been changed since issuance, and (b) the permit was issued by the actual issuing authority. 
provision/ provisioning	Initial loading of mDL information into a holder's digital permit app.
standard	Means the ISO/IEC 18013-5 Mobile Driving License Application standard.
standards compliant	Means a solution that meets the ISO/IEC 18013-5 requirements for interoperability.
verifier	The entity using a permit reader to retrieve data from the holder's device (also referred to as a "relying party").
verifier app	Software running on a verifier's device.

Annex B: Global Status

There are several digital driving license implementations, pilots and proof of concepts happening globally. The table below provides a perspective on where some countries are in their journey of moving towards digital driving permits.

The table reflects information available in the press or other public sources (marked as [P]), as well as information collected through a series of surveys distributed to 45 countries spanning 6 continents in 2022 (marked as [S]). The table is not intended to be an exhaustive list.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Australia [P]	At least one state is issuing. Some other states are planning on it.	Queensland is working with ISO/IEC 18013-5.			
Austria [S]	Not yet. Planning on it.		Will only be valid in Austria in a first step, authentication. Abroad is not possible in the beginning.	Will not be accepted in the near future.	Not plans for the digital permit to replace the physical permit.
Belgium [S]	Talking about it.	This depends on the revision of EU Directive 2006/126	A secure digital infrastructure for all parties involved.	A legal framework based on an international standard, on both EU and UN level.	

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Canada [P]	Not yet. Some provinces planning on it.	May vary by province. As jurisdiction Members to AAMVA the recommendation is to implement digital solutions that comply with ISO/IEC 18013-5.	May vary by province. As jurisdiction Members to AAMVA the recommendation is to implement digital solutions that comply with ISO/IEC 18013-5.		
Cyprus [S]	Talking about it.	In discussion	In discussion		It is not planned that the digital permit will replace the physical.
Czech Republic [S]	Not talking about it.	We are currently working on a model for linking-interconnecting of driver registers and not bringing a driving license with you. Not on the mobile application model and digital format verification.	We are currently working on a model for linking-interconnecting of driver registers and not bringing a driving license with you. Not on the mobile application model and digital format verification.	We prefer the way of linking-interconnecting the driver registers of all Member States	It is planned that the digital permit will replace the physical.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Denmark [S]	Yes	Danish driving licenses are digitally provided through an app. The reading device are handled by the Danish Police. The Danish Police authenticate the digital driving license by scanning the QR Code in the digital driving license app.	It would be necessary to establish a common driving license system and a common reading device where it will be possible to authenticate driving licenses issued by The Danish Road Traffic Authority.	A common driving license system – please see the answer above.	It is not planned that the digital permit will replace the physical.
Estonia [S]	Discussing it.				

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes

Finland [S]	Yes
	• First initiative was in June 2016
	• Project started January 2017
	• Pilot was introduced December 2017 .
	  ○ There was 1000 users of IOS 10 or newer in the pilot group.
	  ○ Second Phase there was 2000 users and in Phase III it was expanded to Anroid users, 5.0. or newer version.
	• Not currently issuing, but planning on it.
		Our intention is to use ISO 18013-5	We'll follow the EU regulations, it means that at least EU driving licence directive must define requirements for a digital driving licence.	Mobile driving licences issued by other countries must follow the same definitions as we do.
				
				The mobile driving licences have to be implemented in accordance with international standards (ISO18013-5). It is our experience that authentication of a mobile version (of any type of certificate) needs solely to be based on a digital verification, that in turn adheres to a common standard. In this sense, a digital driver licence is not comparable to a traditional physical licence, which primary authentication is based on its physical attributes.
					It will be at least now as an additional service.
					Comission's Directive knows/allows only a physical driving license.
					
					Our mobile driving license is not just the license. It is an app which have several services for citizens.
					
					The European Union Digital Identity Wallet (EUDIW) is currently under development. It is possible that EUDIW will include also driving licence information. We are promoting ISO 18013-5 to be used in EUDIW in case that DL.
					It is already the case in many countries that the police have a direct access to driver licence registers, and the development of digital driver licences is only the next step in giving direct access to the register. information will be included.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Germany [S]	Not yet. Planning on it.	Not fixed yet.	Not fixed yet.		It is planned that the digital permit will replace the physical.
Great Britain [S]	Not yet. Planning on it.	Too early to say.	Too early to say.	Too early to say.	
Greece [S]	Yes	The mobile application is able to generate/store and verify the digital documents. Verification is conducted by scanning the QR code of the digital documents which is produced by gov.gr. All gov.gr documents are issued with a qualified digital signature, a unique document ID, and a QR code. The document ID or the QR code are used in order to verify the authenticity and contents of the document. As such, they are tamper proof.	For now, other jurisdictions simply need to download the Greek wallet app (available on both platforms) and as such they will be able to scan Greek digital documents.	A similar EU-wide approach based on the Greek architecture.	It is not planned that the digital permit will replace the physical.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Iceland [S]	Yes	QR code with limited lifetime can be verified by another device	National app from Iceland, but as that is unrealistic, the digital license has no meaning outside of Iceland	A common standard	No current intention of the digital driving license replacing the physical license, at least until it will be internationally recognized.
Ireland [S]	Not yet. Planning on it.	Not discussed yet.	Don't know.	Don't know.	It is not planned that the digital permit will replace the physical.
Italy [P]	Not yet. Planning on it in 2023.	Covid Green Pass model.			
Japan [S]	Talking about it	Not decided at all including whether the Japanese government should issue mDL or not.	Not decided at all including whether the Japanese government should issue mDL or not.	Not decided at all including whether the Japanese government should issue mDL or not.	None
Lithuania [S]	Talking about it	No exact information is available at the moment.	No exact information is available at the moment.	-	-
Luxembourg [S]	Talking about it.			We would be interested to see if the licence is valid, which categories the holder is allowed to drive and if he is subject to a driving ban.	It is not planned that the digital permit will replace the physical. We are waiting to see what will be decided at the European level in this regard and will adapt to it by and large.
Monaco [S]	Not talking about it.				It is not planned that the digital permit will replace the physical.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Netherlands	Not yet. Planning on it.	ISO/IEC 18013-5	A legal basis, ISO/IEC 18013-5 compliant readers and our Issuing Authority CA (IACA) public key certificate.	Acknowledgement of mobile driving licences at UNECE level, a (UNECE?) harmonized set of Certificate Policy requirements, and a service for collecting of IACA certificates and publication of a trust list (Verified Issuer CA List, VICAL, according to ISO/IEC 18013-5), operated by an authoritative governance organization.	It is planned that the digital permit will replace the physical. We would be pleased to contribute to a harmonized set of Certificate Policy requirements and to the discussion on how to shape governance of trust in mobile driving licences.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Norway [S]	Yes	The Norwegian digital driving licence is developed on an App platform. The reading device is built in the driving licence app.	Functionality must be developed to read the driver's license app that communicates with the Norwegian driver's license register, either via a driver's license app or website. There must also be a secure solution that must be consent-based before the driver's license check can take place. The person being controlled must be able to be sure that consent is given to the right person or authority. In addition to secure solutions, legal assessments must be made before a control solution can be developed and put into use. It must also be considered which information can be provided in a check of digital driving licences. The sharing of information must be in line with the GDPR.	The driver's license check must be secure and reliable, it must also communicate with other countries' driver's license registers or in another secure way verify that the driver's license is valid at the time of the check and that it was issued by the driver's license authorities. The driver's license information must be sent in a secure manner so that it does not go astray.	

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
New Zealand [S]					Conceptually digital driver licences have been discussed within the confines of New Zealand's regulatory and policy bodies (NZ Transport Agency & Ministry of Transport), but their is no current road map to this future state.
Romania [S]					It is not planned that the digital permit will replace the physical. We are available to participate in the technical discussion groups with a view to issue the legislation in the field.
Spain [S]					It is not planned that the digital permit will replace the physical. The digital driver licence will be a licence valid to drive only in Spain.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Sweden [S]	Discussing it	ISO 18013-5 (but it depends on what the EU decides).	Revised European and National legislations, technical solutions in place both for the issuing and the reading parties.	A revised European Driving Licence Directive with common rules (probably with reference to the ISO 18013-5). In order to trust mDL's from countries outside of the EU it would be good to include a reference to the same standard also in the UN-conventions on Road traffic.	No plans for the digital permit to replace the physical permit. We are considering a solution nationally which would be based on the direct access for enforcers to the Driving Licence Register. In this case, it would be enough for the driver to identify themselves with a national ID-card in a road check situation. The enforcer can then check the validity of the DL directly via the direct access that they already have in place. No Driving Licence, physical or digital, would be needed. It would save the authorities a lot of money annually. However, this solution would require a change in the EU Driving Licence Directive.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Switzerland[s]	Not yet. Planning on it.	In Switzerland the cantons are responsible of issuing drivers licenses. The FEDRO is however planning with them, thus we can provide information about the project. The mDL-standard will serve as platform. No details are yet known about the interaction between the mobile and the reading device.	Other countries must be able to link to the Swiss registries concerning personal drivers data (Informationssystem Verkehrszulassung-Personen).	A connection to such a database from other countries. E.G. police and border security administration would need to be able to control the data shown by a mobile drivers license.	It is not planned that the digital permit will replace the physical.

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
Ukraine [S]	Yes	Solution that is used in Ukraine is based on the presenting and validation the data from public register. The reader scans qr or bar code presented on the mobile device of the holder and receives validation result (valid or invalid).	Validation of the certificates of electronic seal of the issuer of mDL that is used to protect and authenticate the digital document	Access to a unified service for verification of mDL, to eliminate the need for verification with the services of each country separately. A successful example is covid vaccination certificates in the EU - once connected to the trusted network one is able to work with all certificates of members states of the EU	

Country	Issues mobile/digital permit?	Standard used/to be used?	Needs to be in place for verifiers to read/authenticate?	Like to be in place to trust digital permits from other countries?	Other Remarks/Notes
United States (US) [P]	As of 08/12/2022 there were 8 US Jurisdictions that have implemented digital driving license solutions. 24 Jurisdictions are in various stages of planning, and 1 jurisdiction is talking about it. (Note that this is based on self-reported information; the situation of other US Jurisdictions is unknown.)	Varies by jurisdiction. As the Member Association, AAMVA's recommendation is to use ISO/IEC 18013-5.	Varies by jurisdiction. As the Member Association, AAMVA's recommendation is to use ISO/IEC 18013-5.	Interoperable ISO/IEC 18013-5 mobile driving license solution.	