

Recommendations, Best practices & possible actions on establishing and operating



Urban Vehicle Access Regulations *(personal mobility and freight)*

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1. EXECUTIVE SUMMARY

a. Summary

The document outlines the recommendations on Urban Vehicle Access Regulations by the Expert Group on Urban Mobility, as prepared and endorsed by the EGUM's Subgroup on UVARs and Parking. The recommendations follow the prioritisation of UVARs in the New EU urban mobility framework and the persistence of challenges surrounding the planning, implementation and enforcement of UVARs.

UVARs aim to regulate motor vehicle access to urban areas, utilising techniques such as regulatorions, physical interventions, and pricing measures. UVARs contribute to managing urban mobility challenges, environmental sustainability, and quality of life. The EU aims to reduce greenhouse gas emissions by at least 55% by 2030, prompting measures to encourage emission-free urban transport systems. Sustainable Urban Mobility Plans (SUMP) play a vital role in integrating UVARs into broader urban mobility strategies. UVARs should be accompanied by impact assessments, stakeholder consultations, and comprehensive communication strategies. The enforcement process for UVARs should prioritise transparency, proportionality, and compliance with GDPR regulations.

Road signage plays a crucial role in communicating UVARs to drivers, with harmonization efforts underway at UNECE level. Digital representation of UVARs is essential for fair accessibility, with regulations (Single Digital Gateway and ITS Directive) mandating availability of information UVAR data. A future outlook shows promising applications of integration with Mobility as a Service (MaaS) and account-based approaches, along with TN-ITS/TM2.0 and vehicle connectivity to enhance UVAR effectiveness. Tradable Credit Schemes for Mobility Management offer innovative solutions to urban mobility challenges.

Key-recommendations answer to current concerns about UVARs: Improve road user information and compliance through enhanced communication strategies and digital tools. Implement efficient cross-border enforcement practices and provide guidance on the relation between SUMP and UVARs. Involve non-resident stakeholders in UVAR planning and design, and promote continued dialogue and capacity building within EU urban and mobility initiatives.

The document emphasizes the importance of UVARs in addressing urban mobility challenges and outlines recommendations for their effective implementation. By integrating UVARs into comprehensive urban mobility strategies and fostering stakeholder collaboration as well as (digital) real-time communication with drivers, UVARs can be maintained as solutions to create more sustainable and accessible urban environments, while answering to the needs of road users, and specifically those who are not local to the UVAR scheme.

b. Recommendations

Below is a summary of recommendations as developed in the section xxx. For each recommendation the respective stakeholder has been mentioned.

Improved road user information	
Advance the implementation UNECE UVAR signage	Member States
Implement the new provisions on digitisation of UVARs in the context of the amended ITS Directive.	Member States / Local and Regional Authorities

Facilitate the data generation at local level by creating national UVAR DATEX-II profiles	Member States
Further alignment between DATEX-II and others (e.g. TN-ITS)	European Union
Through structures like NAPCORE ensure sustainable operation, interoperability and maintenance of the UVAR Box tool.	Member States / European Union
Take UVARs into account as a priority topic, establishing a system with up to date information through the SDG portal.	Local and Regional Authorities
Improved compliance	
The EGUM will formulate recommendations on the basis of the UVAR Tech mapping study on digital and technical solutions to enhance UVAR compliance.	EU with EGUM
Implementation of efficient cross-border enforcement practices	
Develop a vehicle information sharing approach that enables compliance and enforcement.	Member States / European Union
Investigate a system that can enable mutual recognition of vehicle conformity.	Member States / European Union
Provide recommendations on either the implementation of expanded scope of the Cross-Border Enforcement Directive, or alternative solutions to address cross-border enforcement.	EU with EGUM
Guidance on the relation between Urban Nodes, SUMP and UVARs	
The current UVAR SUMP topic guide should be revised given the changing position of the UVAR because of the Functional Urban Area coverage of the SUMP.	EU
Realistic pathway to common, recognised UVAR typologies in line with EU legislation	
Establish a common typology for UVARs, allowing for more recognition and acceptance of the schemes.	Local and Regional Authorities / Member States
Involve non-resident stakeholders in planning and design of UVARs	Local and Regional Authorities
Create methodologies and structures to enable dialogue surrounding UVAR planning and implementation with non-resident stakeholders.	EU
Continued dialogue and capacity building within EU Urban and Mobility initiatives	
Maintain UVARs as a key topic in its urban mobility initiatives: ELTIS, CIVITAS, Horizon Europe.	EU

2. INTRODUCTION

The issue of urban vehicle access regulations ('UVARs') is one of the priority areas of the New EU urban mobility framework. Following the establishment of the expert group on urban mobility ('EGUM', 'the group') and taking into account the feedback provided by members of that group, DG MOVE has decided to create a dedicated sub-group to deal with urban vehicle access regulations.

The sub-group's was mandated as following: '(its) tasks shall be to assist DG MOVE in the preparation of policy initiatives implementing the new EU urban mobility framework in relation to UVARs; to establish and enhance cooperation, coordination and communication between the Commission, Member States, cities, regions, and stakeholders on questions relating to UVAR; to bring about an exchange of experience, good practices and strands of actions in the field of UVAR; to deliver to EGUM recommendations on best practices & possible actions from administrations, users and relevant projects (such as UVAR Box, UVAR Exchange, UVAR Tech Mapping, CIVITAS ReVeAL, Dynaxibility) on establishing and operating UVARs for personal mobility and freight.'

In the next part of the document (2 a. Defining UVAR and the scope of this recommendation), we define UVARs (Urban Vehicle Access Regulations) and outline the specific scope of the recommendations being made. The section 2 b. UVARs in the European Urban Mobility Framework brings forward the specific articles that this EC Communication dedicated to UVARs.

Following this, Section 3. Description summarises existing UVAR guidance (in section 3.a) and then then comprehensively explores the EGUM priorities for UVAR-related challenges to be addressed by 2030 (section 3 b.). It covers various aspects such as communication and user-friendliness, exemptions, accessibility, just transition, and the impact of UVARs on professional drivers in goods and passenger transport. Additionally, it addresses fleet transition, subsidiarity in EU coordination, and the treatment of specific niche fleets like historic vehicles. Moving on to Section 3 c., the document proposes solutions for improved UVARs. This includes discussions on road signage, digital representation of UVARs, and methods to ensure compliance. We then included a section on options for UVAR innovations, highlighting an account-based approach, TN-ITS/TM2.0, vehicle connectivity, and Tradable Credit Schemes for Mobility Management in section 3 d.

Section 4 outlines recommendations, such as improved road user information, non-resident stakeholder methodologies, demonstrations of user-friendly compliance and enforcement practices (especially in cross-border contexts), and continued dialogue within Urban Mobility forums on the topic of UVAR. A short conclusion (section 5.) invites the stakeholders to continue to cooperate on the issues raised.

Additionally, the inclusion of annexes provides details on differing EGUM opinions on subsidiarity in the field of UVARs and exemptions, respectively. This enhances the document's depth by incorporating diverse perspectives and supplementary information. The Annexes also include the references and list of abbreviations.

This document has been prepared based on a collaborative process within the EGUM's Subgroup on UVAR and Parking. The Subgroup met four times to prepare this document: a Kick-off meeting - 24 March, 2023 – a fact finding meeting on existing UVAR guidance - 18 April, 2023 - Fact finding meeting Parking and Curb Side Management: 21 April – in person

meeting at the Urban Mobility Days 3-6 October, 2023, Sevilla – Status update – 20 December, 2023. The Subgroup met in person on the 17th of January 2024 in Brussels, and finally endorsed this document in an online meeting on 28 February 2024. There was a regular interaction with DG MOVE about progress. The EGUM plenary meetings were informed about the concept and status of the document. EGUM subgroup members were interviewed and provided written statements.

a. Defining UVAR and the scope of this recommendation

UVARs can be broadly defined as ‘measures to regulate motor vehicular access to urban infrastructure’. As such, several techniques and typologies have been adopted across urban areas to regulate vehicles’ access to urban infrastructure. Next to physical interventions that either prevent vehicles from entering a street or defined zone (e.g. barriers), or slow all traffic within a zone (e.g. 30 km/h zones or woonerfs), UVARs restrict or regulate some or all types of traffic from entering through different regulations.

This EGUM recommendation addresses the full range of UVARs implemented by local authorities:

1. regulatory measures, including regulation by Euro standard emissions or aspiring zero emissions in city logistics, regulation by vehicle type or dimensions (e.g., banning heavy-duty vehicles) or regulation by trip purpose (e.g., access for public transport only).
2. physical interventions, which can include installing (moveable) bollards to limit the volume of traffic in an area, combinations of one-way streets or reallocating space from cars to uses such as a mini-hub for logistics or amenity space
3. regulation by pricing¹, with a congestion charge being one example. Others include urban applications of charging by the distance travelled or dynamic pricing where the price changes depending on demand, or consistent with UVAR targets. This category is not very common in the EU.

Cities establish UVARs to address the complex challenges associated with urban mobility, environmental sustainability, and overall quality of life. As urban populations continue to grow, so does the demand for mobility, leading to increased congestion, pollution, and safety concerns. UVARs serve as a strategic tool for city planners and policymakers to manage and optimise the flow of vehicles within urban areas. By implementing regulations that restrict or control vehicle access based on factors such as emission levels, vehicle type, or time of day, cities aim to reduce traffic congestion, enhance air quality, reduce carbon emissions and promote more sustainable modes of transportation, such as walking, cycling, taxis, coach and public transit for passenger journeys and low and zero emission, smart logistics and right-sized vehicles for good delivery . Additionally, UVARs contribute to creating safer and more pedestrian-friendly urban environments, fostering a sense of community and improving the overall livability of cities in the face of rapid urbanisation and the associated challenges.

Today, over 70 % of the total EU population lives in cities , towns and suburbs and the share of the urban population continues to grow. This share of the population generates 23% of all transport greenhouse gas emissions.² Moreover, road transport is a major source of air

¹ In compliance with the EU Tolling Directive(s)

² European Commission (not dated): Sustainable urban mobility, https://transport.ec.europa.eu/transport-themes/urban-transport/sustainable-urban-mobility_en

pollution, e.g. it accounts for 37% of nitrogen oxide emissions and 23% of black carbon emissions in Europe.³ To help the European Union reduce greenhouse gas emissions (by at least 55% by 2030 and by 90% by 2050), the Urban Mobility Framework initiative proposes measures to encourage EU Member States to develop urban transport systems that are safe, accessible, inclusive, affordable, smart, resilient, and emission-free.⁴ Road transport is an important enabler for economic and social life and one of the key sectors of EU, corresponding to at least 5% of the European Gross Value Added and employing around 10.3 million people.

b. UVARs in the European Urban Mobility Framework

Articles 55 to 58 of the European Urban Mobility Framework (2021) (UMF) (see box) reflect the current thinking about UVARs and the issues surrounding UVARs. Where planning issues are in many cases being documented and informed by recent research and studies, the main issue remains the digital representation of the zones, and herewith connected, digital processes with regards to user-friendliness, understanding and enforcing compliance – specifically for cross-border traffic.

UVAR related articles in the UMF (as part of the chapter: ‘Digitalisation’)

55. Digitalisation also offers a way to resolve certain challenges related to urban vehicle access regulations (UVARs). In Europe, the majority (73%) of UVARs concern low (and zero) emission zones. Low-emission zones can be an effective tool to address local air quality problems, especially for areas where traffic is a dominant source of overall air pollution. In addition, a number of local authorities are considering emergency pollution schemes or road-charging schemes to tackle other issues such as congestion. Indeed, many cities are struggling with local road congestion and air quality issues caused by transport, frequently exceeding EU air quality standards and pollution thresholds. In particular, road transport should become drastically less polluting, especially in cities. The planned proposal for more stringent air pollutant emissions standards for vehicles (Euro 7) will help cities in the transition towards clean mobility. In addition, UVARs can represent a measure to comply with EU air quality standards and to limit congestion and traffic-borne emissions. Furthermore, they also incentivise the use of public transport and active mobility, reducing the access of more polluting vehicles to sensitive urban areas.

56. It is important that where UVARs are deployed they allow for seamless and user-friendly travel across the single market, without leading to discrimination of non-resident drivers. While the introduction of specific UVARs is and should be a task for the competent national and local authorities, the variety of different UVARs poses new challenges in the EU for passenger and freight transport. Road users need better access to information to be aware of these regulations and be able to comply with them; and cities are often unable to set up and properly enforce effective and functional schemes. These challenges are particularly serious for foreign vehicles, even when they have zero emissions. A standardised and effective manner to provide information and data on UVAR rules to drivers is missing. Equally, city authorities have been lacking the data necessary for cross-border enforcement.

57. The Commission has so far focused its efforts on improving the provision of information and data sharing through:

a. implementation of Regulation (EU) 2018/1724 on the Single Digital Gateway, which requires public authorities to provide information to road users through the Gateway;

³ European Environment Agency (2022): Sources and emissions of air pollutants in Europe, <https://www.eea.europa.eu/publications/air-quality-in-europe-2022/sources-and-emissions-of-air>

⁴ European Commission (not dated): Sustainable urban mobility, https://transport.ec.europa.eu/transport-themes/urban-transport/sustainable-urban-mobility_en

b. preparation of the revision of the Delegated Regulation on real time traffic information requiring Member States to give access to a broad range of static and dynamic data to include new data sets, such as those pertaining to UVARs;

c. the 'UVAR Box' project, which aims to help cities develop a user-friendly tool to provide data in a standardised format on urban and regional UVAR schemes;

d. the 'UVAR Exchange' project, which aims to improve the communication of information to drivers in the vicinity of UVAR zones and to improve the local authorities' access to information, especially with respect to foreign vehicles and drivers, for seamless travel and enforcement of UVARs by local authorities.

58. There is a need to work further for effective, cost-efficient, user-friendly and fair solutions that benefit both public authorities and vehicle drivers and owners and help them operate and apply UVARs.

3. DESCRIPTION

a. Summary of existing UVAR guidance

The initial phase of the Subgroup’s activities was to prioritise and re-assess the recent studies and research activities that have been conducted in the field of UVARs. In general, the studies were appreciated for the comprehensive approach they recommend, and can still be seen as core references for future UVAR actions, at local, regional, national and European level. In the next paragraphs we provide a summary of the key recommendations from these studies⁵.

UVARs should be established to achieve a **public policy goal**, not to generate public income. The policy goals should be clearly communicated to the UVAR stakeholders. The expected benefits of the UVARs, as well as the positive results of the scheme in operation, require a clear communication to these stakeholders. Local public policy goals often reflect legally binding national or European targets – e.g. air quality, climate neutrality. With improving fleet characteristics, and the focus of urban policies on climate neutrality, quality of life and provision of high-quality urban space, it is expected that access management will evolve accordingly, as fleets progressively electrify and lower euro-class vehicles phase out from use. The future of UVARs for air quality management will be dependent on the policy choice to see climate neutrality as being zero emission. It is expected that climate neutral (bio or e-fuels) will still have air quality impacts.

A Sustainable Urban Mobility Plan (SUMP), which is a long-term, all-encompassing integrated freight and passenger mobility plan for the entire functional urban area. It should include objectives, targets and indicators underpinning the current and future performance of the

Table 1 - Policy objectives linked to specific UVAR types (UVAR SUMP guidance)

Policy objective	Type of UVAR
Air quality improvement	Low-Emission Zone Ultra-Low Emission Zone Zero-Emission Zone Pedestrian zone
Congestion reduction	Congestion Charge or Tax Limited Traffic Zone Superblocks; traffic routing Pedestrian Zone
Urban landscape preservation (historic town centres)	Limited Traffic Zone Pedestrian Zone
Climate change mitigation	Zero-Emission Zone Limited Traffic Zone Pedestrian Zone
Noise mitigation	Pedestrian Zone Limited Traffic Zone Superblocks; traffic routing Quiet zones Lorry bans/delivery time windows
Road safety	Pedestrianisation Superblocks; traffic routing Lorry bans/delivery time windows
Redistribution of road space	Congestion charge Pedestrian Zone Limited Traffic Zone
Raising revenues	Urban road toll or kilometre charge
Quality of life	All of the above

urban transport system, at minimum, on greenhouse gas emissions, congestion, accidents and injuries, modal share and access to mobility services, as well as data on air and noise pollution in cities.⁶ The SUMP brings the much needed coordination between Push and Pull measures. In urban mobility planning, cities could employ a combination of pull and push measures to shape and optimise transportation systems. Pull measures are incentives designed to attract individuals towards sustainable and efficient modes of transportation, such as low public transport fares, bike-sharing programs, and pedestrian-friendly infrastructure. On the other hand, push measures involve restrictions or disincentives aimed at behaviour with high negative external impacts or risk. UVARs qualify under this category.

Cities often integrate these approaches to create a comprehensive and balanced mobility

⁵ REVEAL, UVAR Box, UVAR Exchange, 2017 EC Study on UVARs

⁶ REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on Union guidelines for the development of the trans-European transport network, amending Regulation (EU) 2021/1153 and Regulation (EU) No 913/2010 and repealing Regulation (EU) 1315/2013

strategy. The UVAR should be **integrated in the SUMP**. From the point of view of planning and design, an integrated approach is an important step for achieving both local and European added value, given that the effectiveness of any kind of UVAR scheme depends on such a strategy. SUMP can define the policy goals, the modal hierarchy and the alternative options that address mobility issues of those negatively impacted by the UVAR. The SUMP also can provide the context to understand the appropriateness and proportionality of the UVAR scheme as part of a package of reasonable and locally applicable and effective solutions.

Local authorities are invited to undertake an **impact assessment** involving a cost and benefit analysis from an environmental, social and economic perspective, including the impact of the proposed measures on the local economy, businesses (including those companies involved in passenger and goods transport) and visitors. The impacts could be assessed against targets and with indicators that will also return in the scheme’s evaluation (cfr. infra). The assessment should avoid systematic bias against schemes which penalise car use and prioritise public transport.

Table 2 - UVAR stakeholders based on REVEAL and EGUM subgroup inputs

<i>Public authorities</i>	<ul style="list-style-type: none"> • Authority colleagues in relevant departments • Neighbouring authorities • Other levels of government (regional and national) • Transport authority(s) 	<i>Other</i>	<ul style="list-style-type: none"> • Representative associations (e.g., people with disabilities, older people’s forums, tourism, car drivers, cyclists...) • Special groups (e.g., women, elderly, youth, migrants) • Those who contract or hire drivers/vehicles • Interest groups (e.g., NGOs, community groups) • Universities, research institutes • Building occupants • Local, regional, national media • Schools and children • Emergency and security services • Local and (if relevant) national politicians • General public
<i>Business</i>	<ul style="list-style-type: none"> • Chamber of commerce • Business and trade associations • Freight associations • Shopkeepers • Individual businesses (if significantly affected) • Transport operators • Navigation services 		
<p>For the business and other stakeholder categories, local as well as non-local (including international) road users should be considered.</p>			

The planning and implementation process is recommended to be – like any urban mobility measure – **co-designed with those who will be affected by the UVAR**. Choosing the best form of consultation is important. The strategy must consist of structured interaction with a wide range of stakeholders in a form that is tailored to each group of stakeholders who have an interest in the project under consideration. The participatory process should be planned in a way to allow for feedback from a broad set of stakeholders and so that not only the loud and resistant voices are heard. Keep in mind that the benefits to society can be manifold: time savings, health benefits, independent travel – no need to travel accompanied by a parent or a carer, more green, higher revenues for urban shops, etc. In assessing the potential benefits

municipalities have therefore to include also monetary and non-monetary elements attributable to improvements in the mental and physical health of the local population, etc.

It is recommended to practice open and professional **communication**. In addition to the consultation in the design phase, the adoption of a UVAR scheme should include a clear and comprehensive communication and information strategy. The communication process could continue after the launch of the scheme.

Commercial road freight transport is a key component of efficient logistics chains and is often the only option for urban delivery. The fundamental role of collective passenger transport, namely buses, coaches and shared mobility by taxi, in providing viable, safe, inclusive and environmentally friendly alternatives to the private car and in solving congestion problems must be recognised. **Mobility alternatives for people and goods** are crucial for the success of the scheme. Setting up and promoting suitable complementary and alternative transport modes and options is a key factor in changing users' attitudes and ensuring the success of the scheme. The UVAR allow access to people and goods, albeit perhaps not with the initially planned mode. The package of measures that should accompany the UVAR implementation, can include incentives that enable compliance to the scheme. For example, specific solutions for low- income households can be taken (social leasing schemes, bike subsidies, PT fare reduction). This also applies to small enterprises (e.g. renovation companies) to enter the city centres without needing the budget for buying a new car accessing alternative options. Measures should include an increase of supply of alternatives, as well as high-quality opportunities to change mode in intermodal hubs.

Most UVAR schemes include **exemptions**. It is recommended that these exemptions are clear, fair and limited to ensure a high level of effectiveness. Emergency vehicles (e.g. ambulances, fire trucks, police vehicles) must retain access. Introduce as few exemptions as possible but as many as necessary. A long list of exemptions can be confusing to the public, bureaucratic to organise and ultimately reduce the effectiveness of the scheme. Ideally, exemptions cover existing administrative categories (e.g., holders of a disability card) and do not create new approaches of categorising road users and are time-limited enabling them to change when needed.

Compliance and ensuring compliance through enforcement can be considered as important aspects for UVARs. The enforcement process consists of two elements: checking vehicle characteristics against UVAR requirements and a response to non-compliance (penalising the owner of the vehicle that breaches the UVAR, either by fines or fees). The process of enforcement is concluded either by clearance of the vehicle (if the vehicle has the right to access the regulated street or area), or by execution of the sanction or payment linked to the non-compliance.

The enforcement of those restrictions should remain in the hands of local or regional authorities – as part of public services. Outsourcing the prosecution of public penalties to private companies should be carefully considered in view of legal implications for drivers. It is clear that for the entire enforcement protocol, GDPR compliance is of critical importance.

The enforcement process may include the following principles:

- Make the need and criteria for compliance clear and unambiguous.
- Cities can only implement those enforcement procedures and technologies that are required/allowed in the national or regional legislation.
- The enforcement procedures are preferably dealt with under administrative law, rather than criminal/penal law.

- Transparency of the enforcement procedure: the competent authority ensures the ability of the driver to understand the full enforcement procedure, in all its steps. There should be a contact point for further information. Milestones in the enforcement procedure should be publicly available. A reasonable approach to dealing with multiple languages could be developed.
- Transparency can also relate to the openness about the use of revenue from fines or fees.
- Proportionality of sanctions, i.e., in line with what is needed to achieve the objective of the UVAR and to comply with the UVAR.
- Possibility of appeal to enforcement-related decisions with minimal thresholds.
- Fair and non-discriminatory treatment of different user categories (e.g., foreign vehicles, Corps Diplomatique licensed vehicles, retrofitted vehicles, ...).
- Cost-efficient use of technologies and manpower to enable the enforcement procedure (i.e. in many cases Automated Number Plate Recognition).

If UVARs are planned to **evolve over time**, this can be considered as part of the initial discussions with stakeholders and should be included in the communication so that those considering a new vehicle purchase can meet the upcoming standards. The evolution can consist of changing the exemptions over time, to change the zone where rules apply or a change in access rules. This means that people and companies who are not affected initially are also incentivised to rethink their travel routines and vehicle choices in the near future.

Independent **evaluations** of the schemes after they have been implemented should be part of a regular assessment that is publicly announced. This enables the UVAR to be adapted if necessary. The findings of the evaluation should be communicated in a clear and comprehensible way to people. Social, environmental and economic impact can be taken into account in the evaluation. The optimisation of the UVAR should be geared towards the local authority's SUMP goals. Economic impact assessment should be completed with a social impact assessment.

Cities are invited to understand the **positive economic value of the UVAR** in terms of health benefits, time gains, increased travel opportunities. It is important to mention that UVARs contribute to improved cost-benefit ratios of public and private sector transport investments and compensations, e.g. if public transport is not held up in congested car traffic, the public compensation for public transport has a better economic return and more people can travel faster than without the UVAR.

The ReVeAL project provided a Tool which can guide cities in making decisions on UVAR implementation, and the ReVeAL Guidance gives cities guidance on many of the aspects of UVAR implementation, including those mentioned within this document. Those considering implementing an UVAR should consult these resources.

b. UVAR related challenges to be addressed by 2030

In the section above, the EGUM highlights a solid baseline for planning and implementation of UVARs, but issues remain that need to be addressed by local, regional, national and European authorities. The focus turns to user-friendliness, specifically to non-resident drivers, a coherent approach towards exemptions from UVARs, touching upon the status of persons with reduced mobility in this regard. The issue of professional drivers is addressed, as well as the position of UVARs in the fleet transition. and the role of the European Union in coordination and harmonisation., Europe's move towards climate neutrality (as laid down in the law) and the boost of zero-emission vehicles (as legislated) will change the role and challenges for urban vehicle access regulations. Adhering to air quality norms (i.e. enforcement of low

emission zones) will no longer be the driving force for cities to use UVARs. But other challenges such as use of urban space, congestion and road safety will remain and need to be addressed by cities. UVARs are there to stay.

Communication and user-friendliness – specifically for non-resident drivers

It is recommended to practice open and professional **communication**. In addition to the consultation in the design phase, the adoption of a UVAR scheme should include a clear and comprehensive communication and information strategy. The communication process could continue after the launch of the scheme.

Direct information should not focus solely on the population within the area under consideration for the UVARs. City administrations should give weight and importance to those stakeholders in locations **outside the area** for which the scheme is planned, as they are among those affected by the introduction of UVARs. Non-residents are currently not well consulted (foreign drivers/ freight operators, coach operators, etc). Internationally operating industries (car rental, road haulage, and coach, a.o.) and road users that can be considered to be impacted by the UVAR, can be reached through their national branch organisations. They can convey concerns with regards to long-haul access while understanding the national/regional approach.

With the ever-growing importance of international access to European cities, reaching out to stakeholders beyond the local context is becoming more important. Information and communication should cover frequent, occasional and one-time users with different needs. UVAR schemes should avoid discrimination of non-resident drivers, or of vehicles that are not registered in a specific city or enter a particular city only sporadically. Foreign businesses and visitors, and non-local users in general, should have access to high-quality information about the rules and regulations of UVAR schemes. National or regional websites for UVARs can help with this.

The key pieces of information required by drivers not familiar with the local situation are as follows:

- Where and when do restrictions apply
- Which vehicles are concerned; do special rules apply to vehicles with a foreign registration and what is the regime for fully electric vehicles
- The cost of accessing a restricted zone and/or of driving in an area subject to UVAR
- How to pay, as well as the method of enforcement (cameras, bollards, police checks...); penalty fees
- Alternative transport options as well as parking options (park-and-ride) outside UVAR zones
- Exemptions for specific categories of drivers (e.g., Persons with Reduced Mobility) or vehicles (e.g., electric cars and vans).

Ideally, this information would be available both in the local language and in English. In case of pre-registration or account-based systems, the procedure of how to register vehicles and fleets should be specified.

In terms of the format in which this information would be helpful for non-locals, whether individuals or professionals: it is particularly critical for location information on UVARs to be shared as geospatial data, in (i) a format that can be either processed by navigation service providers, AND (ii) a static format that allows operational planning for impacted companies. Too often, information is only shared (if at all) as a list of street names or a PDF map at best, requiring navigation service providing companies to manually recreate the underlying

datasets. Users specifically emphasise the importance of information provision in a digital format via a single access point. The UVAR Box project gives support to cities on digitising data to meet the above requirements (see later).

In terms of disseminating information cross-border, to achieve good results, machine-readable standardised information needs to be available to a large scope of service providers, route planners, apps, and websites. Any administrative procedures should be able to be performed online, by users in their own (foreign) country. Good quality UVAR information should also be provided on the city and national websites. The UVAR requirements of the Single Digital Gateway (SDG)will support the management and harmonisation of the information available in Europe. The Directive (EU) 2023/2661 amending the ITS Directive will support the obligation of EU Member States to provide machine readable and accessible UVAR data.

These issues are currently addressed in the EC's UVAR Tech study aiming at mapping & identifying interoperable digital and technical solutions for user-friendly compliance demonstration of vehicles.

Exemptions, accessibility and just transition

Different associations raise concerns about the need to be exempt from UVARs due to the dependency on vehicles to travel/transport goods, the economic costs of replacing vehicle to cleaner motorisation or the unavailability of options to replace vehicles, (see ANNEX 6.e). However, it is clear that extended exemptions can reduce the effectivity of the schemes.

There is a specific concern about the exemptions made for **people with reduced mobility**. Within the group of PRMs, a specific concern should go to people with disabilities. The scope of the exemptions is a point for discussion, but it is recommended travellers with disabilities have ease of access and UVARs take this into account. This issue has multiple dimensions: Specific attention should be given to access for vehicles that have been adapted for use by

Best practice - The **Flemish LEZ regulations** provide for the exemption as follows, whereby there must be a clear link with limited resources or an adapted vehicle:

- For vehicles used by or for persons with disabilities, at least one of the following conditions must be met:
- the owner of the vehicle or a person domiciled at the same address is entitled to increased healthcare reimbursement and has a special parking card for people with disabilities
- the vehicle is adapted for the transport of persons with disabilities and has an approval issued by the competent government authority and the owner or a person residing at the same address has a special parking card for persons with disabilities
- the vehicle is adapted for the transport of people with disabilities and is used for adapted transport services
- the vehicle is equipped with an integrated system mounted in or on the vehicle and intended to place a wheelchair in the vehicle together with the user
- The following categories have been added in a recent update of the legislation;
- Formal caregivers of persons in need of care, provided they have recognition and they or the person in need of care live in the LEZ
- parents of a child with a disability who lives with the other parent
- The registration of the exempt vehicle must be renewed every 5 years.

people with reduced mobility. Recent figures of the EC suggest 90 million EU citizens out of

448 million have a disability⁷. It is clear that there is an impact on the schemes if 20% of travellers and their carers traveling by car are exempt from any form of access regulation. It is suggested that exceptions for vehicles for persons with disabilities can best be limited in time, but with adapted timescales that provide more 'forgiveness'. The most appropriate criteria for exemptions relate to those which would make use of public transport or active travel modes practically impossible or unrealistic for the individual.

Example: Milano AREA C exemption list

- Access to Area C for health reasons
- Non-profit social and healthcare assistance
- Exemption for taxis and NCCs with up to 9 seats
- Companies with service vehicles
- Operators active in animal protection
- Social and health workers
- Residents in Area C and equivalent
- Parking in affiliated garages
- Vehicle replacement
- Transport of urgent medicines
- Freight transport 8:00-10:00
- Vehicles with disability badge
- Historic vehicles
- Vehicles over 7.5 metres

(<https://www.comune.milano.it/aree-tematiche/mobilita/area-c>)

It is worth mentioning that public transport is accessible to many – particularly those with disabilities and who have reduced income opportunities and might otherwise not have transport options open to them. Specific attention should be given to the mobility of low-income households. Different options are on the table in terms of access to compliant vehicles, including sharing or vehicle purchase subsidies, access to alternatives such as public transport and active travel. In the case of Barcelona for instance they are exempted for the UVAR. (reference).

The issue of historic vehicles was addressed as an issue of growing concern. A clear distinction should be made between vintage vehicles with historic value and pre-Euro classification cars that could be seen as 'just old vehicles'. A definition of historic vehicles is included in the Directive 2014/45/EU on periodic roadworthiness tests for motor vehicles and their trailers. Some historic vehicles are used for commercial use (functions, markets etc.). No common recommendation on this issue was formulated.

UVAR and professional drivers - Freight transport

Regarding freight transport, specific work should be undertaken with all stakeholders to define new urban logistics schemes that could contribute to changing the current operations in view of the UVAR, ideally in the framework of a Sustainable Urban Logistics Plan integrated in a

Brussels Regional LEZ premium

Professionals can apply for the LEZ premium as support for the replacement of their company vehicle or for the installation of a charging station. Do you need to replace a light commercial vehicle that is no longer allowed to drive in the Brussels Capital Region because it is a low emission zone (LEZ - Low Emission Zone)? Under certain conditions, you can receive up to €15,000 in support if you lease or purchase an electric or petrol commercial vehicle (not diesel). The premium can also partly cover the installation of a charging station.

SUMP. A sustainable urban logistics plan (SULP) can effectively integrate specific measures for freight transport restrictions and regulations to optimise the movement of goods while minimising negative societal (including environmental) impact. Time-sensitive delivery windows and designated routes for freight

⁷ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13517-European-Disability-Card/public-consultation_en

vehicles can be enforced through smart technology and regulatory frameworks, ensuring minimal disruption to urban traffic flow.

Specific issues could be considered: the truck drivers ask room to park in the vicinity of the UVAR, coordination with driving times and delivery time windows, ... all add to the complexity. The introduction of delivery time windows for freight should always be designed with a good understanding of the operational models in place within that jurisdiction (e.g. hours based on store opening hours for B2B have little to no overlap with delivery hours for B2C parcels and post).

Consultation with social partners in commercial road transport in the drafting of SUMP and SUIPs must be ensured so that the UVAR system takes into account the sector's needs. The coordination of the restrictions between different UVAR's is necessary, so that the restrictions (window times, tonnage ban,) of the different UVARs are adapted to each other and make it possible to travel from one UVAR to another.

UVAR and professional drivers - Coach transport

Coach transport has a very relevant strategic importance due to its close link to the tourism industry, which is an important industry accounting for 10 % of Europe's GDP. Coach facilitates sustainable tourism and inter-city travel, and stands out for its capillarity, allowing you to go where other modes do not to access the most remote towns while traveling with all possible comforts. The promotion of coach tourism and scheduled services can contribute very effectively both to the public policy objectives of reducing emissions and to greater competitiveness of the tourist offer, given that it mitigates last mile problems and overcomes the constraints present in other modes.

In this regard, exempting inter-urban and regional coach transport should be considered. There is a growing insight amongst stakeholders that coach is a very specific segment with limited technology options, not evolving as rapidly as the city bus, truck and car market. The market is currently not able to supply long-distance, zero-emission coaches. The small size of the market and its specific use case require specific attention. An overall ban of coaches from cities will prevent specific groups like tourists, school children and other visitors from entering the city, impacting economic, social and cultural life. Solutions should aim to enable coach access with minimal externalities, congestion and impact on travellers.

UVAR and fleet renewal

LEZ and ZEZ are one of the important components in the transition towards clean fleets. Low- and Zero-emission zones should be linked to local action with regards to providing sufficient charging and refuelling infrastructure (in line with Alternative Fuels Infrastructure Regulation). As far as logistics are concerned, in an initial phase with limited availability of clean vehicles, it could be considered to ensure extended access options and delivery windows for low and zero emission vehicles, so the same level of service can be granted. Whereas urban bus fleets are rapidly being decarbonised in many cities, completion of full zero-emission operation will take more time (to 2035 at least) and there remains a need for access for bus services to provide efficient and accessible urban transport.

Regarding UVARs and fleet transition for commercial vehicles, the supportive measures balancing the UVAR (and the Sulp or Sump's "push measures") should take into account the greater variety of ownership and operational models in logistics fleets compared to private vehicles. Indeed, many purchasing subsidies for low-emission vehicles are targeted exclusively for individuals or entities buying vehicles and not leasing vehicles, although leasing is very common in freight and commercial vehicles. Specific freight vehicles for uses such as ADR⁸-transport require consideration.

Amsterdam: Scrappage regulations for diesel passenger cars, emission class 4

From October 1, 2023 to June 30, 2025, you can apply for a demolition subsidy after you have had your diesel passenger car with emission class 4 scrapped at a recognized demolition company. (Check the RDW website for recognized demolition companies in your area). If you meet all the conditions, you will receive € 1,000 compensation. If you have a city pass you get 50 percent extra. Before you have your car scrapped, it is important that you first check whether you meet all the conditions: According to the basic registration, your address is in the municipality of Amsterdam. You have been the owner of the diesel passenger car with emission class 4 for at least 6 months continuously. You had the diesel vehicle scrapped after June 6, 2023 and before June 30, 2025. You will receive a subsidy for this vehicle in this category for the first time. You can only apply for a subsidy for 1 car.

Cross-border enforcement

The scope of technological possibilities for implementing UVARs has significantly expanded. C-ITS gives new opportunities for information dissemination, while variable message signs (VMS) are increasingly used for UVARs, particularly for reactive schemes such as emergency pollution situations. By far the most common technology is automatic number plate recognition cameras (ANPR). Other technologies include passive radio-frequency identification systems (RFID tags, often used for tolls or opening gates), with dedicated short-range communication (DSRC), satellite positioning (GNSS) coupled with mobile communications (GSM), and digital tachographs, to name a few. These systems all rely on access to the data of national Vehicle Licence Registration Authorities. These are not accessible for UVAR enforcement across borders.

Enabling compliance with traffic rules across Europe and enforcing them accordingly is complex, necessitating stakeholder connections, appropriate legal agreements for data exchange, secure data transfer systems and reliable, up-to-date, and digitalised vehicle and owner/driver information⁹. In addition, UVAR schemes are shaped by the unique environmental, political, and social contexts of urban areas, as well as needing to adhere to local and (inter)national regulations and conditions.

Therefore, approaches to UVAR rules and compliant vehicle access vary between countries and even among different cities, thus creating confusion for road users. Additional difficulties arise when the road users are foreign, as they are less familiar with the local area and may be required to pre-register for LEZs for each city they wish to enter. Challenges are also faced by authorities when it comes to regulating these foreign vehicles¹⁰. Key will be to make UVARs seamless for a better travelling throughout Europe.

Ideally, enforcement of UVARs for foreign operators should be respected – to enable this it is essential that EU Member States exchange the necessary information digitally in order to efficiently enforce legislation and avoid discriminatory practices. In waiting for this

⁸ Accord Européen Relatif au Transport international des marchandises dangereuses par route – Dangerous goods transport

⁹ The UVAR Exchange project

¹⁰ EC study on Urban Vehicle Access Regulations (2017)

comprehensive approach, there are several options available to cities – none of which are

Example: Cross-Border Enforcement - Barcelona

To enter the LEZ in Barcelona a vehicle needs to meet Spanish national standards and to have a sticker (Distintivo Ambiental) provided by the Ministry of Interior organization Dirección General de Tráfico (DGT). Based on the vehicle data, DGT categorises all vehicles into the sticker classification. This dataset of licence plates and sticker categories is weekly retrieved by Barcelona from DGT national database and the LEZ local database of vehicles is actualised with this information. Vehicle owners can print the stickers if they want but they are not obliged to. Foreign vehicle owners need to pre-register through the city website where the vehicle owner/holder makes an individual profile and provides vehicle characteristics and a copy of the vehicle technical information This is currently verified manually by a city service. Vehicle registration costs 7 euros and is applicable indefinitely. Owner-holder contact information is also needed to be able to inform in case of tightening the LEZ regulation. The owner holder can always log in to their profile to add or change the vehicle or personal information. Registered data can be shared (user consent) with national DGT but is not done yet. If a vehicle is not compliant with LEZ regulation there is an option to buy a max of 10 daily passes per year.

The LEZ is enforced by automatic vehicle detection with Automatic Number Plate Recognition (ANPR) system, managed at a regional level. Most license plates can be matched with the country of origin, but some license plates are difficult to match e.g., from Belgium or Morocco. When a vehicle is not compliant nor registered, the (stored) ANPR picture is sent to the city police department where the offence took place. The local police will manually control the offence (check the license plate with the vehicle and owner registration). The fine issuing and collection are done by the provincial fiscal department “Deputation de Barcelona”, except Barcelona city who has its fiscal services. A fine collection for foreign vehicles is not processed as there is no legal basis for it. The technical data exchange is possible through EUCARIS, and was demonstrated with AMB and DGT, as demonstrated in UVAR Exchange.

(accessed: https://uvarbox.eu/wp-content/uploads/2023/12/Panteia_Annex5_DemoActivities_clean.pdf)

ideal. Bilateral agreements can enable the exchange of data but require the national authorities to enable this; and a spiderweb of bilateral agreements goes against the European idea. The Netherlands make technical vehicle data open data; but this is not an option for most Member States. Without bilateral agreements, the only way authorities can check compliance is to require pre-registration to identify the emissions standard, as the enforcement authority has no other way of gaining this information. The pre-registration and compliance is then enforced with fines, administered with bailiffs or debt collection agencies as the only option (where fines are not sent from the authority can be sent months after the event, causing confusion). Current practice is often to enforce only national vehicles and those foreign vehicles from countries with bilateral agreements, and not the other foreign vehicles – leading to calls of unfair treatment. This is considered a sub-optimal. There are two issues here, one legal, and the other technical. These need to be resolved in the coming years.

UVAR Exchange recommendations on Cross Border Enforcement

For several UVARs, Cross-border enforcement is dependent on getting access to data on foreign vehicles and their owner/ holder.

City authorities rely on different methods/mechanisms to obtain this data for enforcing UVARs.

Some prefer collecting data beforehand (through pre-registration), others collect data on the spot (through physical checks). Yet others, prefer collecting just the license plate number through ANPR technology and then obtain more information on the vehicle by consulting foreign counterparts/databases through bilateral agreements.

To strengthen cross-border enforcement in EU, the different methods to access data (by city authorities) should be strengthened.

A clear legal basis should be established, allowing Member States to share relevant data for UVAR enforcement. For this directives such as the CBE or EETS could provide a relevant opportunity.

Simultaneously, efforts to 'harmonize the type' and 'improve the quality' of digital data in national registers of all Member States should be supported. This can be done by updating Directive 1999/37/EC under the ongoing EU initiative to revise roadworthiness package.

Systems/services that connect National Focal Points between Member States to share vehicle and owner/holder related data, should also be accessible by city enforcement authorities.

Collection of data before-hand should be strengthened by looking into possibilities offered by SDG and OOTS (once-only technical system). Initiatives such as European Blockchain Service (EBSI) and technologies such as Verifiable Credentials and EU Digital Wallet should be leveraged to allow citizens to reliably share their data with enforcement authorities.

On-spot data collection by city authorities should be reinforced. For this possibilities offered by connected vehicles should be explored allowing them to share data with city infrastructure. Also, the use of tools such as Tachographs and DSRC technology should be expanded.

Subsidiarity: role of EU in coordination and harmonisation of UVARs

The EGUM members expressed different views of where the UVAR competence should be situated. The opinions ranged from no to full competence at EU level. Annex 6.d brings forward the different opinions. It is important to understand these different opinions in case there would be a legislative initiative on UVAR or partial aspects of UVARs in the future.

c. Solutions for communication and compliance: road signage and digitalisation

In this section, we highlight three solutions areas that are currently under development, and offer the opportunity to resolve several of the issues mentioned in section 4. An important element is digital representation of UVARs, with the subsequent applications in information, compliance and enforcement, but we start with 'analogue' information. All digital technologies are problematic for people who have difficulties operating technology. We might exclude people and we have to be careful. There have to be 'analogue' alternatives to find UVAR information.

Road signage

Road signage is an important aspect of the UVAR communication. Road signalling gives directions to drivers and warn them about the regulated zones is fundamental. Care must be taken to provide clear messages when UVAR signs are part of a larger set of signs. Harmonisation of these road signs at the appropriate level is recommended. AT UNECE level, the Informal Intergovernmental Group of Experts on Road Signs and Signals (IIGERSS), in September 2023, accepted the recommendation developed by the UVAR Exchange study to introduce a sign to indicate a zero and low emission zone. This contains a recommended image (a C category sign with motor vehicle and exhaust pipe smoke) and its definition. The proposed images will be a bit refined i.e., smoke to be shown as a contour only, grill to be added, and contrast rims for the zonal validity signs to be widened." Further steps are expected to follow in the context of the Vienna Convention on Road Traffic Signs.

The UNECE's focus on signage for UVARs, is a direct response to the proposals made by the UVAR Exchange proejct. UVAR Exchange identified that UVARs can be a challenge to communicate via road signs, given that they are often more complex than usual road rules. There have also been complaints due to different types of road sign being used in each country. The [UVAR Exchange project](#) provided recommendations to help cities and member states develop intuitive UVAR signage. These include:

- Place signs both at the entry and early enough to allow drivers to divert
- Include pictograms and minimal text
- Avoid local abbreviations and acronyms
- Put the required information on a main panel and use sub-panels for further information (see Figure 1 and Figure 2 below)

Guidance on the use of Variable Message Signs (VMS) for UVARs is also provided.

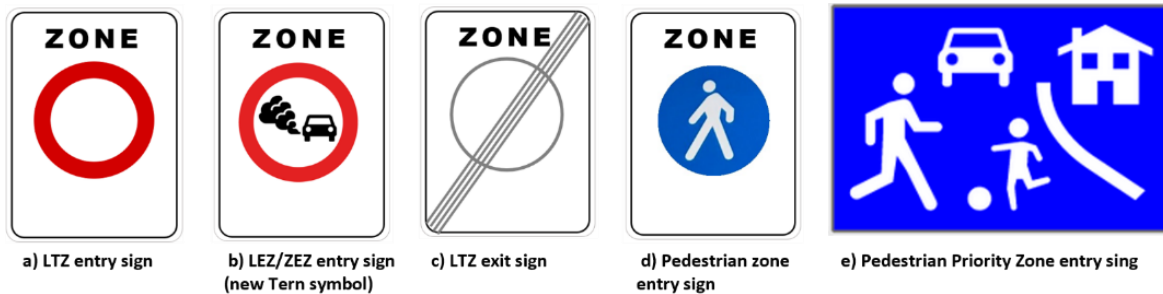


Figure 1: Recommendations for UVAR main panel road signs

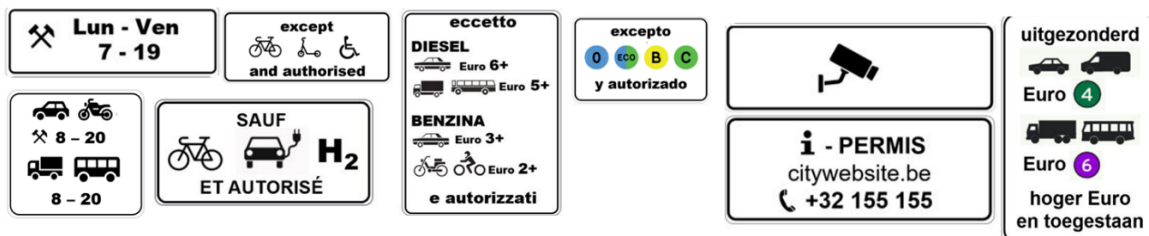


Figure 2: Recommendations for the sub panels

Regulating by classes of vehicles that are defined at EU level can support defragmentation of UVAR practices and is highly recommended. It can facilitate communicating about UVARs. This does not mean that the same rules apply throughout Europe, but that the basic building blocks of the UVARs are easier to understand. On the other hand, vehicle manufacturers should make it easier for drivers and specifically occasional users of vehicles to be aware of the EURO-class they are driving by clearly mentioning the classification in a visible location in the vehicle.

Digital representation of UVARs

Digitalisation should be the tool aimed at ensuring fair accessibility to urban areas. [Regulation \(EU\) 2018/1724](#) on the Single Digital Gateway, requires Member States to provide information to road users. Article 2(2) point (a) and Annex I of the regulation lists under point c), point (5): national traffic rules and requirements for drivers, including general rules for the use of the national road infrastructure: time-based charges (vignette), distance based charges (toll) and emission stickers. Though the terminology UVAR is not explicitly referred to, the meaning covers UVAR to a large extent. Regarding the procedure for obtaining emission stickers for Low Emission Zones, the Regulation stipulates that such stickers issued by a public body or institution must be fully available online by 12 December 2023. Information on national traffic rules including the above UVAR dimension should have been made available by municipal authorities as of 12 December 2022.

Given that much private and business travel in new areas is undertaken with the support of digital navigation tools, information on UVARs needs to be included in these digital tools. In order for this to happen, cities need to provide information on their UVARs in digital machine-

to-machine-readable (M2M) format. The UVAR Box project has provided a user-friendly tool to make that task easier for cities. The tool, together with a manual and training can be [accessed here](#)¹¹.

Furthermore, EGUM welcomes Directive (EU) 2023/2661 amending the ITS Directive which obliges Member States to avail UVAR data in a machine-readable digital format and make them accessible. The inclusion of UVAR data as priority use case in the RTTI delegated act ([Commission Delegated Regulation \(EU\) 2015/962](#) on real time traffic information (RTTI)) requires

Timeline for availability of UVAR related static and dynamic data in the NAP	
weight/length/width/height restrictions	31-12-2026
freight delivery regulations	31-12-2026
traffic circulations plans	31-12-2028
permanent access restrictions	31-12-2026
boundaries of restrictions, prohibitions or obligations with zonal validity, current access status and conditions for circulation in regulated traffic zones	31-12-2026

Member States to give access to a broad range of static and dynamic data through the National Access Points (NAPs). The Regulation was revised in 2022 and renamed [2022/670](#). It includes new data sets, such as those pertaining to UVARs (applicable from January 2025 onwards). This will stimulate the reuse of the UVAR data. The National Access Points are invited to support the data generation and availability and to cooperate on a framework for data validation and a sustainable data maintenance process.

Advantages to cities of digitising their UVARs include:

Greater awareness leads to greater compliance and less enforcement work. The impact of the schemes should be bigger and the number of complaints and queries should dwindle.

Service providers (e.g. Google) are increasingly contacting cities for their UVAR data; if a city shares with one provider in its requested format, it must do the same for others ([Open Data Directive](#)).

Using [UVAR Box](#) and its single [EU-wide DATEX II format](#) means provide data once only on the [National Access Point](#) and on the city's or the national open data website, rather than in a different format for each service provider.

Information on emissions stickers and on national traffic rules will be required on the [Single Digital Gateway](#) by the end of 2023 and UVARs must also be there. This data is required in SDG format; DATEX II can be easily imported into this.

[ITS Directive & delegated regulation](#): Delegated Regulation 2022/670 on real time traffic information will require that if an authority has digitised UVAR data, this must be made accessible on a NAP as from January 2025. Obligation of availing and accessing machine-readable digital formats of UVAR data under the amended ITS regulation

The inclusion of UVARs in navigation services significantly reduces the resistance to them at a non-local level. Cities often have their own general digitisation processes. UVARs can be incorporated there.

Some countries and cities are currently working on “digital mirrors” of their traffic regulations, which means that the digital representation of the UVAR is equally valid in legal terms as the regulation or traffic sign (e.g., [METR](#))

¹¹ The tool is expected to be hosted by the different [National Access Points](#) in the future, however, links to the tool page in different countries will be given on [this page](#).

Digital UVAR data is needed for geofencing, Intelligent Speed Assistance, connected and automated vehicle deployment.

d. UVAR innovations

UVARs are part of a rapidly evolving transport landscape, with digitalisation and new mobility management methods changing the agency of local authorities and expectations of road users. The EGUM highlights three areas of future innovation in this field: MaaS including not only transport services, but also 'Compliance as a Service', new traffic management methods, and finally tradeable mobility credits schemes.

Integration with MaaS and account-based approaches

Innovative ways to manage permit rights and exemptions by means of a mobility wallet would be useful to consider. A better understanding of road users (and on an aggregated level collective) behaviour can lead to account-based pricing that could have different levels of flexibility.

These systems could be supported by evolution of technology (such as verifiable credentials) and EU initiatives (e.g., EU Digital Wallet and European Blockchain Service Infrastructure). These technologies empower citizens to easily and securely share their data – also in a cross-border context. For this purpose, the necessary changes to the Regulation (EU) No 910/2014 (eIDAS regulation v.2) are needed. It is expected that European digitalisation projects can enable over time a better coordination of assets (road infrastructure) and access (Vehicle) and drivers (User) thus regulating access to specific areas.

TN-ITS/TM2.0 and vehicle connectivity as enablers for UVARs

Innovative traffic management technologies could enable dynamic UVARs in which the access right and cost depends on real-time local conditions. This should be treated with caution: while this is a possibility, excessive variability in access rights and associated costs could be detrimental to freight operators. By complicating the estimation of total cost of ownership for a given vehicle technology, companies may then be led to investment decisions (e.g. when acquiring low-emission vehicles) that are suboptimal if not enough visibility is given into the cost structure and evolution of access costs if UVAR rules are too dependent on real-time traffic.

Vehicles are becoming increasingly connected and devices fitted in vehicles are also evolving. They could relay relevant data to enforcers, helping them detect non-compliant vehicles. In that sense it is important to maintain technology neutrality in legislation on enforcement, keeping option for enforcement through V2X possible and not narrowing down technology options to ANPR only.

The current approach to sharing vehicle data (e.g. under the approach of the Data Act) is user centric, not allowing for access to vehicle data unless it is consented by the user. The sectoral initiative on access to in-vehicle data, functions and resources will conform to these criteria and will currently not mandate further non-user centric access. In case of an account based UVAR this could become a way of communicating with the UVAR system. In this context, the geofencing application of automatically switching to full electric drive in an hybrid vehicles is worth mentioning.

It is recommended to explore future initiatives of the European Commission on access to vehicle data, functions and resources, within frameworks such as the Data Act to seek vehicle data for enforcing regulations such as UVARs. Some of the provisions already allow for public

authorities to access data, but this is limited to cases of public emergencies for which UVARs does not qualify. Vehicle manufacturers are invited to co-develop a UVAR enforcement ecosystem like SRTI (Safety-Related Traffic Information) ecosystem with urban stakeholders.

It is important to address this in the changes foreseen to the Directive 1999/37/EC on the registration documents for vehicles to digitize vehicle registration certificates and mandate their electronic storage in national databases as well as in further legislative initiatives on access to vehicle ID within the frame of the proposition to seek vehicle data for enforcing regulations such as UVARs.

There is also a need to consider the retro-fitting of emissions abatement systems to vehicles to improve their environmental footprint as fleets move to zero emissions. All electronic records of vehicle emission characteristics will need to reflect such retrofitting otherwise such action will have been futile in terms of their ability to operate in areas where otherwise they would be prohibited.

Tradable Credit Schemes for Mobility Management

Related to account-based and dynamic UVARs, tradable credit schemes (TCS) are innovative instruments to manage mobility (Yang and Wang, 2011). In a TCS for mobility, the authority determines the area of application, the objective (e.g. 30% reduction of congestion, or the maximum energy/air pollution the system can consume/generate) and the users to be served. The authority then allocates mobility credits to whole population to be served and charges on the basis of the mobility choices made by the users.

The credits have a corresponding monetary value meaningful within its trading market. Travellers whose mobility choices that are in line with the authority's objective can save credits and benefit from selling unused ones to other travellers, who may have exhausted those they initially owned. This interaction takes place in a market, monitored by the authority. Unlike other strategies, TCSs for mobility aim to be explicitly equitable and are more likely to gain public acceptance, since travellers are rewarded for making choices that are sustainable, and there is no money flow between the travellers and the authority, with the latter supposed to be revenue neutral.

Even though TCS for mobility has not been applied in the real world so far, experiments and game simulations demonstrate its potential to effectively manage urban mobility. By reducing traffic congestion, lowering emissions, and encouraging sustainable transportation choices, it contributes to cleaner air, improved public transport, and less noise pollution. It offers financial incentives for eco-friendly choices, promotes equity, and informs urban planning decisions.

At the same time since real world applications of TCSs are still in their infancy it is necessary to take a step-wise and participated approach in their implementation to avoid that they could induced undesired effects and rejected by the local population. The engagement of local citizens as well as businesses in the co-design of these schemes will be therefore essential to their success.

4. RECOMMENDATIONS

Improved road user information

1. Member states are invited to advance the implementation of the decision taken at UNECE level with regards to the above-mentioned road signage solutions .the [UNECE road sign convention](#). **(MS)**
2. Member states, cities and regions are invited to implement the new provisions on digitisation of UVARs in the context of the amended ITS Directive, and the Single Digital Gateway provisions. UVAR Box is an important tool for this purpose. The different stakeholders (Member states, NAPs, SDG coordinators, and NAPCORE) are invited to nominate and support UVAR Box country coaches – i.e. go-to expert organisations that can promote and support the continued maintenance of the UVAR DATEX-II-formatted information for all UVARs in the area that has been assigned to them. **(MS, Local and Regional Authorities)**
3. Member states are invited to facilitate the data generation at local level by creating national UVAR DATEX-II profiles that embed national legislation. Further alignment between this format and others (e.g. TN-ITS) should be pursued and supported by the EU. Through structures like NAPCORE the EU should ensure sustainable operation, interoperability and maintenance of the UVAR Box tool. **(MS, EU)**
4. National and local-level Single Digital Gateway Regulation implementers are invited to take UVARs into account as a priority topic, establishing a system with up to date information to help citizens for cross-border procedures and for information provisions on UVARs through the SDG portal. **(MS, Local and Regional Authorities)**

Improved compliance

5. The EGUM will formulate recommendations on the basis of the UVAR Tech mapping study on digital and technical solutions to enhance UVAR compliance demonstration of vehicles towards more user-friendliness. Specific attention goes to understanding the potential of compliance related services building on Mobility data Space deployment (2024) and EDIC (European Digital Infrastructure Consortium) Mobility and Logistics (2024-2025). **(EU with EGUM)**

Implementation of efficient cross-border enforcement practices

6. Member states and EU are invited to develop a vehicle information sharing approach that enables compliance and enforcement and that does not require pre-registration by vehicle owner/holders. This can provide a comprehensive mechanism to enforce UVARs in a cross-border context. **(MS, EU)**
7. Member states and EU are invited to investigate a system that can enable mutual recognition. The principle of mutual recognition entails that vehicles that are listed in the country of residence as certified/conform and compliant to a specification (such as Euro vehicle class after retrofitting) should be recognised by other enforcement body of any other EU Member State. **(MS, EU)**
8. Depending on the outcome of the revision Cross-Border Enforcement Directive, the EGUM will be mandated to provide recommendations on the implementation of the expanded scope of the CBED, and remaining issues related to the UVAR cross-border

enforcement issue, taking into account different views on digital enforcement. **(EU with EGUM)**

Guidance on the relation between Urban Nodes, SUMPs and UVARs

9. The revision of the TEN-T regulation implies a SUMP planning obligation for 431 urban nodes on the TEN-T. Given the necessity to integrate UVARs into the SUMP, the current UVAR SUMP topic guide should be revised given the changing position of the UVAR because of the Functional Urban Area coverage of the SUMP, the policy priorities for urban nodes in view of greening and digitalisation of transport, as well as the infrastructural requirements for the Urban Nodes. Plans should describe how UVARs find a balance between limiting congestion, improving air quality and ensuring business continuity. The EC is invited to prepare updated guidance on these aspects. **(EU)**

Realistic pathway to common, recognised UVAR typologies in line with EU legislation

10. Cities, regions and member states are invited to establish a common typology for UVARs, allowing for more recognition and acceptance of the schemes. Qualifications related to European legislation can be the starting point for such a starting harmonised framework: e.g. Euro-classification of vehicles, weights and dimensions of vehicles, as well as exemptions for People with Reduced Mobility (and in the future, holders of the European Card for persons with disabilities and/or European Parking card for persons with disabilities), can be binding elements. For instance, even if exemptions get decided on by local authorities, the chosen exemptions could be taken from an exhaustive list of exemption categories, decided at the EU or member state level, to avoid a high variability in categories. This task can be part of the next EGUM mandate, supported by R&I activities. **(MS, Local and Regional Authorities)**

Involving non-resident stakeholders in planning and design of UVARs

11. UVAR competent authorities, as well as national and regional UVAR legislators, are invited to create methodologies and structures to enable dialogue surrounding UVAR planning and implementation with non-resident stakeholders, or to designate existing stakeholder structures with this task. Cities and regions should involve the commercial road transport sector. The EC is invited to prepare updated guidance on these aspects. **(Local And Regional Authorities, EU)**

Continued dialogue and capacity building within EU Urban and Mobility initiatives

12. Given the broad deployment in the EU, we invite the EC to maintain UVARs as a key topic in its urban mobility initiatives: ELTIS is invited to regularly publish case material on UVARs. The CIVITAS initiative is invited to build capacity about this topic. Horizon Europe can provide the framework for continued research on UVARs in the context of climate neutral cities, scaled electromobility, new sensing and monitoring technologies and advanced traffic management. The European regional differences and city characteristics and specificities should be taken into account when addressing UVARs in these initiatives. **(EU)**

5. CONCLUSION

In conclusion, the EGUM recognises Urban Vehicle Access Regulations (UVARs) as part of the toolbox of local authorities in fostering sustainable urban mobility. The dialogue in the EGUM has prioritised a number of remaining issues that need to be addressed to ensure the understanding, acceptance, compliance and efficiency of Urban Vehicle Access Regulations.

The recommendations lists a number of elements that highlight different views on more controversial issues. These can be the basis for continued dialogue, capacity building, and future collaboration among stakeholders. This can inform future legislative and coordination actions from national and the EU legislator.

The recommendations try to answer to these challenges and propose concrete actions for the EU, the Member States and Local and Regional Authorities – either ‘as such’ or in various constellations of cooperation. The recommendations also invite the EU to continue to work with the EGUM on the issues raised.

6. ANNEXES

a. List of acronyms and abbreviations (in alphabetical order)

ANPR	Automated Number Plate Recognition	MaaS	Mobility as a Service
B2C	Business2Client	METR	Management of Electronic Traffic Regulations
C_ITS	Cooperative Intelligent Transport Systems	NAP	National Access Point
CBE	Cross-Border Enforcement	NAPCORE	National Access Point Coordination Organisation for Europe
CIVITAS	EU initiative for cities and mobility www.civitas.eu	NCC	“noleggio con conducente”, or rental with driver
DG MOVE	European Commission Directorate General for Mobility and Transport	NGO	Non-Governmental Organisation
DSRC	Dedicated short-range communications	OOTS	Once-Only Technical System
EBSI	European Blockchain Services Infrastructure	RDW	Dutch national vehicle register
EETS	European Electronic Tolling System	RFID	Radio-frequency identification
EGUM	Expert Group on Urban Mobility	RTTI	Real Time Traffic Information
eIDAS	Electronic Identification And Trust Services	SDG	Single Digital Gateway
ELTIS	EU Urban Mobility Observatory	SULP	Sustainable Urban Logistics Plan
EU	European Union	SUMP	Sustainable Urban Mobility Plan
EUCARIS	European Car and Driving License Information System	TCS	Tradable Credits Scheme
GDPR	General Data Protection Regulation	UMF	Urban Mobility Framework
GNSS	Global Navigation Satellite System	UNECE	United Nations Economic Committee for Europe
IIGERSS	Informal Intergovernmental Group of Experts on Road Signs and Signals	UVAR	Urban Vehicle Access Regulation
ITS	Intelligent Transport Systems	V2X	Vehicle - to - anything
LEZ	Low Emission Zone	VMS	Variable Message Signs
M2M	Machine - to - Machine	ZEZ	Zero Emission Zone

b. Differing EGUM opinions on subsidiarity in the field of UVARs.

These are **different views of where the UVAR competence should be situated** – in order of growing involvement of the EU. These are not recommendations:

1. It is to the city to establish the regulation. EU level harmonisation is not considered appropriate, because it is crucial that the design and implementation of such schemes can be tailored to the specific situation in each urban area. The most appropriate level

for harmonisation is the level which is responsible for compliance with the Air Quality Directive.

2. UVARs should be based on national or regional legal frameworks (level responsible for environmental policies).. It would be necessary for the Municipalities, before establishing the UVAR, to consult the national/regional authority competent in this manner.
3. UVARs should be harmonised at national/regional level.
4. Decisions to introduce UVARs should be notified to the European Commission.
5. The EU should take (legal) initiatives that enable cities to act within their own competences (e.g., reference to UVARs as Air Quality measure (DG ENV)), without making UVARs obligatory. Cities might not have the political, administrative or technical capacity to implement UVARs.
6. All measures that regulate vehicle access to urban infrastructure are UVARs, and should be addressed by European Recommendations or Guidelines.
7. Harmonised standards for information and vehicle registration should be developed by the European Commission.
8. Principles for introducing a UVAR and possible targets should be harmonized at EU level
9. Cities should fulfil the local emission limits by complying with, but not exceeding, the regulatory framework (avoid "Gold Plating" regarding 2008/50/EG).

c. Differing EGUM opinions on exemptions

There are also different subsidiarity viewpoints when it comes to the definition of exemptions (cfr infra). This is not a recommendation.

1. The exemptions have to be decided by the local authority.
2. There is the need to clearly define in an EU Regulation or Directive the exemptions that are always valid, for which it may be not necessary to be included in road signs, in which only specific exemptions could be specified.
3. Even if exemptions get decided on by the local authority (#1), the chosen exemptions should be taken from an exhaustive list of exemption categories, decided at the EU or member state level, to avoid a high variability in categories (e.g. there are 30+ categories in FR low-emission zones today). The country-level or EU list of possible exemptions should include (a) exemptions that are always valid (e.g. people with reduced mobility), (b) optional exemption categories (e.g. historical vehicles), which the local authority may choose to include or not for their UVAR. For the optional exemptions, the local authority could also decide on its duration (permanent or for a few years only).
4. For the urban bus fleets, again grant assistance is often available for purchase of zero emission vehicles but the various operating modes in member states encompass publicly and privately owned fleets, not all of which are covered by contractual decarbonisation plans. Exemptions for these fleets as they transition to zero emissions must be maintained to avoid unintended adverse consequences such as modal shift away from public transport if its penetration of urban areas is reduced.

5. If car sharing vehicles are exempted, then rental vehicles as well, specifically with the market introduction of new business models and operational models.
6. Commercial vehicles must be exempt from urban access vehicle restrictions due to the high costs, and negligible benefits of restricting their access. Commercial vehicles, with trained professional drivers, represent only 10% of all vehicles in an average city. Restricting their access has a correspondingly low impact on congestion, while the continuous increase in passenger cars should in fact be targeted.
7. Unrestricted access to cities should be granted to commercial vehicles which comply with the latest European norms and standards, supply collective or shared mobility services (coaches and taxis, in particular when they are used to service vulnerable users – school children, older people, persons with reduced mobility), use alternative and renewable fuels or load and unload during off-peak traffic periods. Commercial vehicles, with trained professional drivers, represent only 10% of all vehicles in an average city.
8. Access should be ensured to residents, visitors and employees.

d. References

EU Projects and Studies

EC, 2017, Final Report – Study on Urban Vehicle Access Regulations, Available from https://transport.ec.europa.eu/system/files/2017-09/uvar_final_report_august_28.pdf

Horizon Europe REVEAL project (www.civitas-reveal.eu)

UVAR Box (through www.UVARBOX.eu)

UVAR Exchange Publication at the Publication Office of the European Union

- <https://op.europa.eu/publication-detail/-/publication/e73aaf15-957c-11ee-b164-01aa75ed71a1>
- <https://op.europa.eu/publication-detail/-/publication/cb13dbf5-9581-11ee-b164-01aa75ed71a1>
- <https://op.europa.eu/publication-detail/-/publication/d4261c40-957a-11ee-b164-01aa75ed71a1>
- <https://op.europa.eu/publication-detail/-/publication/346dd383-957c-11ee-b164-01aa75ed71a1>
- <https://op.europa.eu/publication-detail/-/publication/00024d8c-957f-11ee-b164-01aa75ed71a1>
- <https://op.europa.eu/publication-detail/-/publication/1818c472-9581-11ee-b164-01aa75ed71a1>
- <https://op.europa.eu/publication-detail/-/publication/0782d32f-9584-11ee-b164-01aa75ed71a1>

Legal frameworks

COM(2021) 811 final – EC Communication - The New EU Urban Mobility Framework

SDG Regulation (2018/1724): [Regulation - 2018/1724 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2018/1724/oj)

Directive (EU) 2023/2661 amending the ITS Directive: Directive - EU - 2023/2661 - EN - EUR-Lex (europa.eu)

COM(2023) 512 final - Proposal for a Directive establishing the European Disability Card and the European Parking Card for persons with disabilities

Further reading

EU, 2016. EU Emissions Trading System (EU ETS) [WWW Document]. Climate Action - European Commission. URL https://ec.europa.eu/clima/policies/ets_en

Yang, H., Wang, X., 2011. Managing network mobility with tradable credits. Transportation Research Part B: Methodological 45, 580–594. <https://doi.org/10.1016/j.trb.2010.10.002>