



Regulatorna perspektiva implementacije potpuno automatiziranih vozila

Od testiranja do komercijalne usluge

Lovro Nobile

Project 3 Mobility d.o.o.

Verne



verne

Rimac ekosustav – luksuz, tehnologija i autonomija

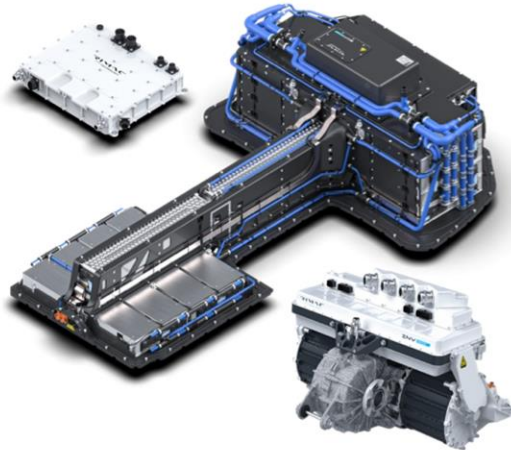
Luxury



BUGATTI + RIMAC

Combining the most prestigious brand with the most cutting-edge automotive technologies.

High End Tech/EV



RIMAC
TECHNOLOGY

Tier 1 battery and mobility technology supplier for automotive industry, providing also sustainable solution for stationary storage.

New Mobility



verne

End to end autonomous ride-hailing platform, redefining the future of mobility.

Dva pristupa autonomnoj mobilnosti



Industrijski pristup

Tradicionalni igrači autoindustrije ograničeni su ostavštinom poslovnih modela temeljenih na prodaji milijuna vozila privatnim kupcima.

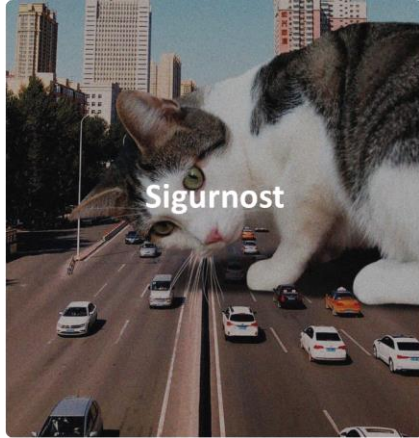
Startup pristup

Startup-ovi nemaju iskustva u proizvodnji serijskih vozila, niti su usredotočeni na korisničko iskustvo.



Unaprijeđena mobilnost dostupna svima

Status quo



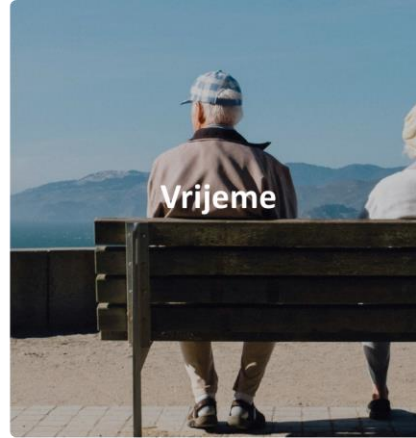
Sigurnost

1.5 milijuna poginulih u prometu godišnje



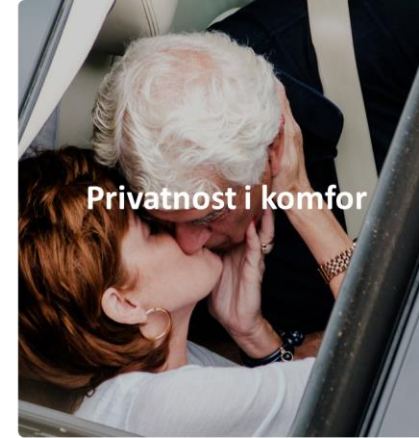
Investicija

Druga najveća investicija modernog kućanstva



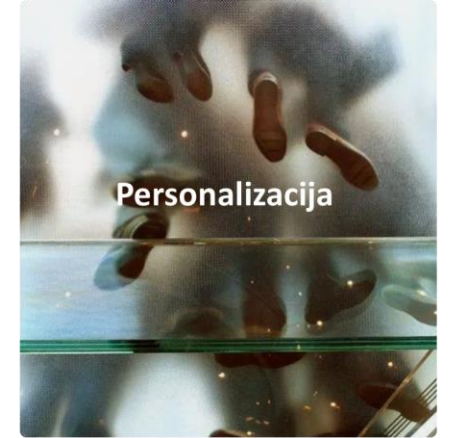
Vrijeme

Izgubljeno vrijeme u prometnim gužvama



Privatnost i komfor

Automobili upitne čistoće i tehničke ispravnosti



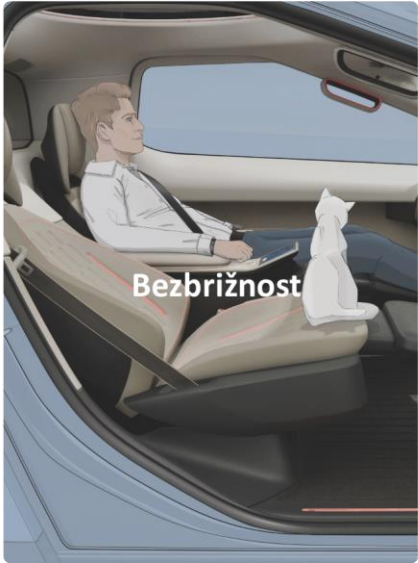
Personalizacija

Usluga koja nije prilagođena individualnim potrebama

Naša vizija



Sigurnost u pokretu



Bezbričnost



Slobodno vrijeme



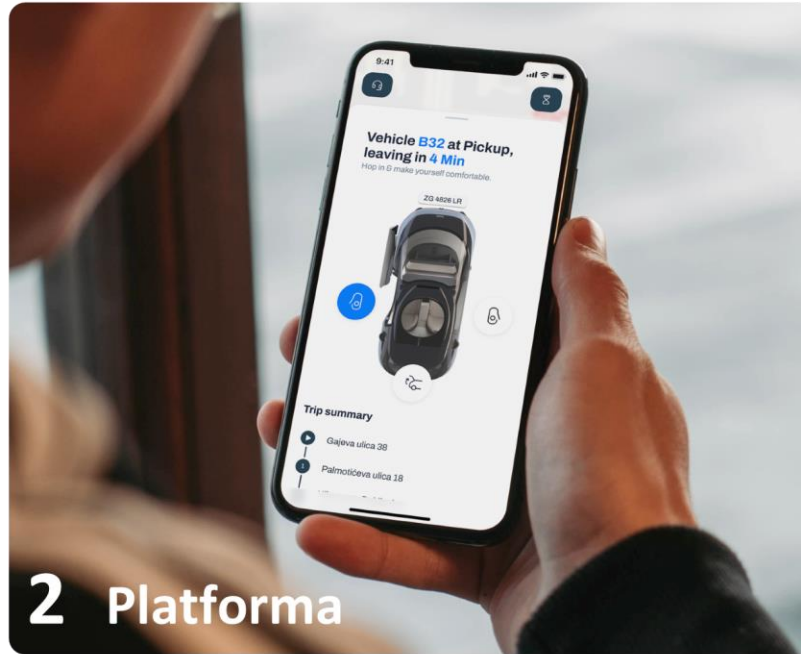
Osobni prostor



Personalizirano iskustvo

Sigurnost cestovnog prometa izazovi novih tehnologija

Novi ekosustav urbane autonomne mobilnosti



verne



13 KAMERA / 3 LIDARA DUGOG DOMETA / 6 LIDARA KRATKOG DOMETA / 6 RADARA

MOBILEYE ADS SUSTAV

TRUE REDUNDANCY

ROBUSTAN SUSTAV PERCEPCIJE OKOLINE KOJI SE SASTOJI OD DVA NEOVISNA PODSUSTAVA:

KAMERE I RADARI + LIDAR

ROAD EXPERIENCE MANAGEMENT

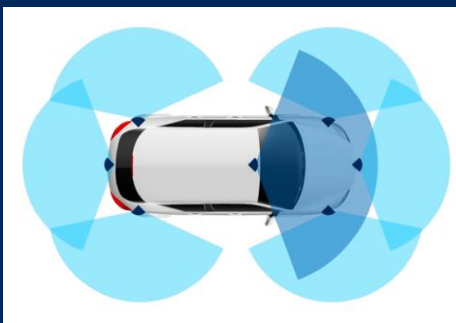
VLASTITO, KONSTANTNO AŽURIRANO MAPIRANJE GRADOVA ZA AUTOMATIZIRANA VOZILA

RESPONSIBILITY-SENSITIVE SAFETY

FORMALNI MODEL ZA DONOŠENJE ODLUKA KOJI OSIGURAVA SIGURNOST AUTOMATIZIRANIH VOZILA

REGULATORNO ODOBRENJE

MOBILEYE PRVI DOBAVLJAČ SUSTAVA AUTOMATIZIRANJE VOŽNJE KOJI JE DOBIO KBA ODOBRENJE ZA VOŽNJU JAVNIM PROMETNICAMA



PRIJELAZ KONTROLE VOZILA OD VOZAČA NA SUSTAV AUTOMATIZIRANE VOŽNJE ZAHTIJEVA PARALELNO DJELOVANJE NEKOLIKO VRSTA SENZORA.

MOBILEYE RAZVIJA NEOVISNE SUSTAVE PERCEPCIJE OKOLINE KAKO BI LIDAR, RADAR I KAMERE MOGLI NEOVISNO JEDNI O DRUGIMA PRUŽATI PODATKE NUŽNE ZA UPRAVLJANJE VOZILOM.

RADAR I LIDAR: ZA RAZLIKU OD KAMERA KOJE PASIVNO RAZUMIJU SVOJE OKRUŽENJE, RADAR I LIDAR DJELUJU AKTIVNIM EMITIRANJEM SIGNALA I MJERENJEM NJIHOVIH REZULTATA.

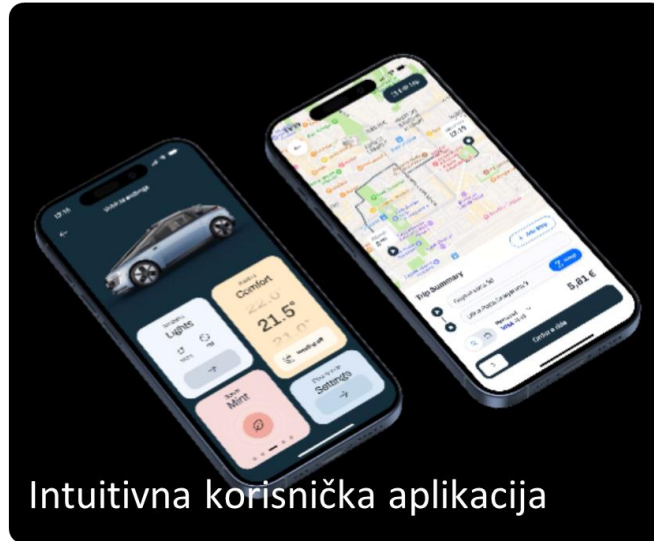
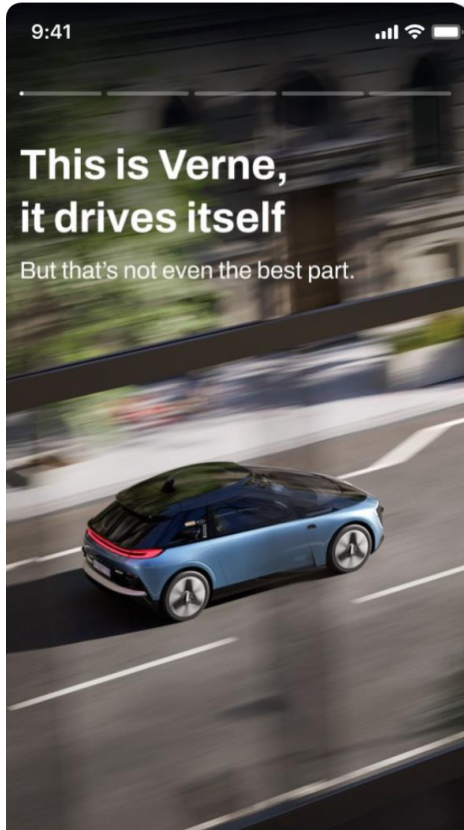
TO IM OMOGUĆUJE DETEKCIJU DRUGIH OBJEKATA I SUDIONIKA U PROMETU TE ODREĐIVANJE RELATIVNE UDALJENOSTI.

RADAR TO ČINI RADIOVALOVIMA, DOK LIDAR KORISTI INFRACRVENO SVJETLO. OBJE SU VRSTE ŠIROKO PRIHVAĆENE U INDUSTRIJI AUTONOMNIH VOZILA ZBOG SVOJIH JEDINSTVENIH MOGUĆNOSTI, PRI ČEMU SVAKA POPUNJAVA SLIJEPE TOČKE KOJE OSTAVLJA DRUGA.

TRUE REDUNDANCY: PRIJELAZ KONTROLE VOZILA OD VOZAČA NA SUSTAV AUTOMATIZIRANE VOŽNJE ZAHTIJEVA PARALELNO DJELOVANJE NEKOLIKO VRSTA SENZORA.

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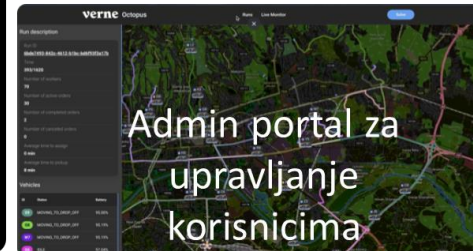
Razvoj softvera za uslugu autonomne mobilnosti



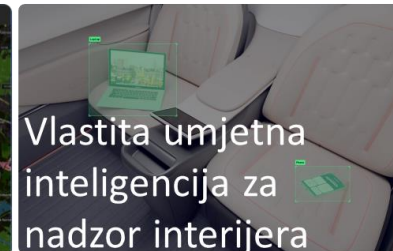
Intuitivna korisnička aplikacija



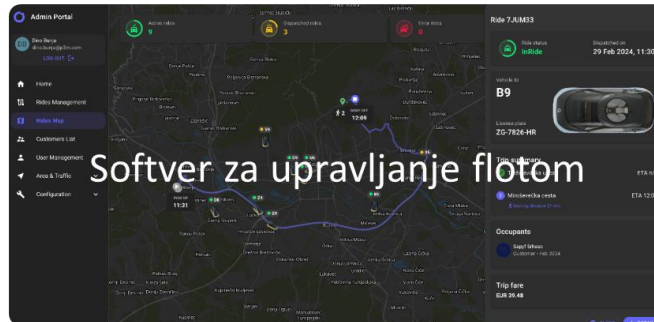
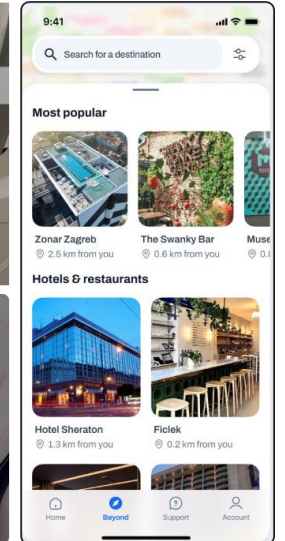
3D simulator za razvoj usluge i validaciju funkcionalnosti



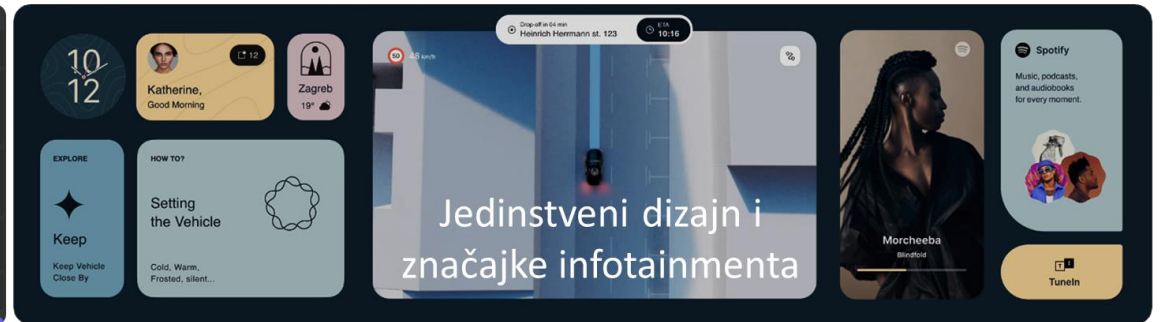
Admin portal za upravljanje korisnicima



Vlastita umjetna inteligencija za nadzor interijera



Softver za upravljanje flotom



Jedinstveni dizajn i značajke infotainmenta

Get started

By tapping "Get started" you agree to Verne [Terms & Conditions](#) and [Privacy Policy](#).

Optimizirana inspekcija, održavanje, čišćenje i punjenje



Inspekcija vozila
minimalno jednom
dnevno



~32min
Vrijeme punjenja od 5% do 85%



Čišćenje interijera i
eksterijera



<1 sat

Ciklus punjenja, čišćenja i
održavanja

REGULATORNI OKVIR

OD TESTIRANJA DO KOMERCIJALNE USLUGE
PRIMJER SAVEZNE REPUBLIKE NJEMAČKE

Faze implementacije usluga autonomne mobilnosti

Faza testiranja

- Testiranje prototipova autonomnih vozila
- Fokus na validaciju sigurnosti komponenti motornog vozila
- Testiranje ADS sustava u raznovrsnim scenarijima
- Dozvola za testiranje

Faza inicijalne usluge

- Kontinuirana provjera sukladnosti tehničkih uvjeta
- Provjera organizacijskih uvjeta za pružatelja usluge
- Širenje područja prometovanja
- Regulatorna osnova za licenciranje putničkog prijevoza

Faza zrelosti

- Autonomna vozila kao dio sustava gradskog prijevoza
- Politike nadležnih tijela usmjerene na optimizaciju prednosti novih oblika mobilnosti
- Široka dostupnost vozila, kvalitetna usluga za sve

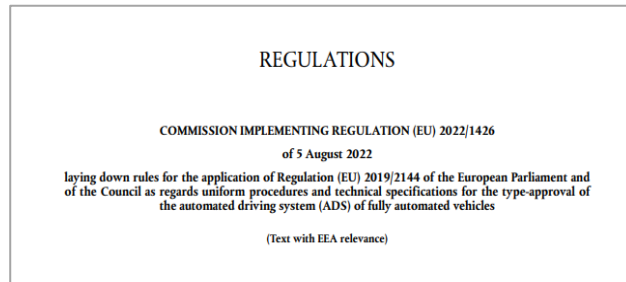
FOUR KEY RELEVANT AREAS OF REGULATION FOR OUR SERVICE				
	TECHNICAL	ROAD SAFETY	SERVICE	INSURANCE
DESCRIPTION	<ul style="list-style-type: none"> HOMOLOGATION AND TYPE APPROVAL PROCEDURES VALIDATES THAT THE ADS CAN OPERATE SAFELY WITHIN A DEFINED ODD 	<ul style="list-style-type: none"> LEGAL FRAMEWORK GOVERNING AV OPERATION ON PUBLIC ROADS SETS OUT CONDITIONS FOR AV PERMITS AND REGISTRATION OUTLINES OBLIGATIONS FOR PUBLIC AUTHORITIES AND PRIVATE OPERATORS 	<ul style="list-style-type: none"> LEGAL FRAMEWORK GOVERNING AUTONOMOUS PASSENGER TRANSPORT SERVICES SETS OUT ORGANIZATIONAL REQUIREMENTS FOR AV OPERATORS 	<ul style="list-style-type: none"> LEGAL FRAMEWORK SURROUNDING AUTONOMOUS VEHICLE INSURANCE SETS OUT MANDATORY INSURANCE PRODUCTS AND MINIMUM LIMITS
ROBOTAXI RELEVANCE	<ul style="list-style-type: none"> EUROPEAN WHOLE VEHICLE TYPE APPROVAL PROCEDURES AMENDED NEW EU REGULATIONS (IN FORCE SINCE 2022) ENABLE TYPE APPROVAL OF FULLY AUTOMATED VEHICLES 	<ul style="list-style-type: none"> PROCEDURES GOVERNING APPROVAL OF TECHNICAL, OPERATIONAL, SECURITY AND SAFETY STANDARDS FOR AV OPERATION DEFINITION OF LEGAL ACTORS AND THEIR RESPONSIBILITIES ALLOCATION OF RESPONSIBILITY TO DECISION-MAKING AUTHORITIES 	<ul style="list-style-type: none"> SERVICE LICENSING PROCEDURES SETTING OUT OPERATING CONDITIONS SHIFT TO REGULATING OPERATORS AND VEHICLES, AS OPPOSED TO DRIVERS AND VEHICLES 	<ul style="list-style-type: none"> VERNE HAS APPOINTED A GLOBAL INSURANCE BROKER (MARSH MCLENNAN) VERNE WILL CHOSE A STRATEGIC PRIMARY INSURANCE PARTNER BY Q1 2025
	EU REGULATION 2022/1426 AND 2022/2236	STRAßENVERKEHRSGESETZ(STVG) VERORDNUNG (AFBGV)	PERSONENBEFORDERUNGSGESETZ (PBEFG)	PFLICHTVERSICHERUNGSGESETZ (PFLVG)

European Whole Vehicle Type Approval (EWVTA)

Homologation and type approval procedures that motor vehicles intended to be placed on the market for consumers meet the relevant environmental, safety and security standards

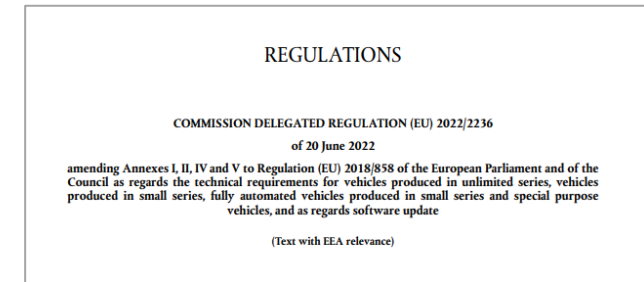
AUTOMATED DRIVING SYSTEMS IMPLEMENTING REGULATION

- COMMISSION IMPLEMENTING REGULATION (EU)2022/1426
- HIGH-LEVEL FRAMEWORK FOR THE TYPE-APPROVAL OF AUTOMATED AND FULLY AUTOMATED VEHICLES TO ENSURE THEIR SAFE OPERATION ON THE ROAD
- ENTERED INTO FORCE ON SEPTEMBER 15TH 2022



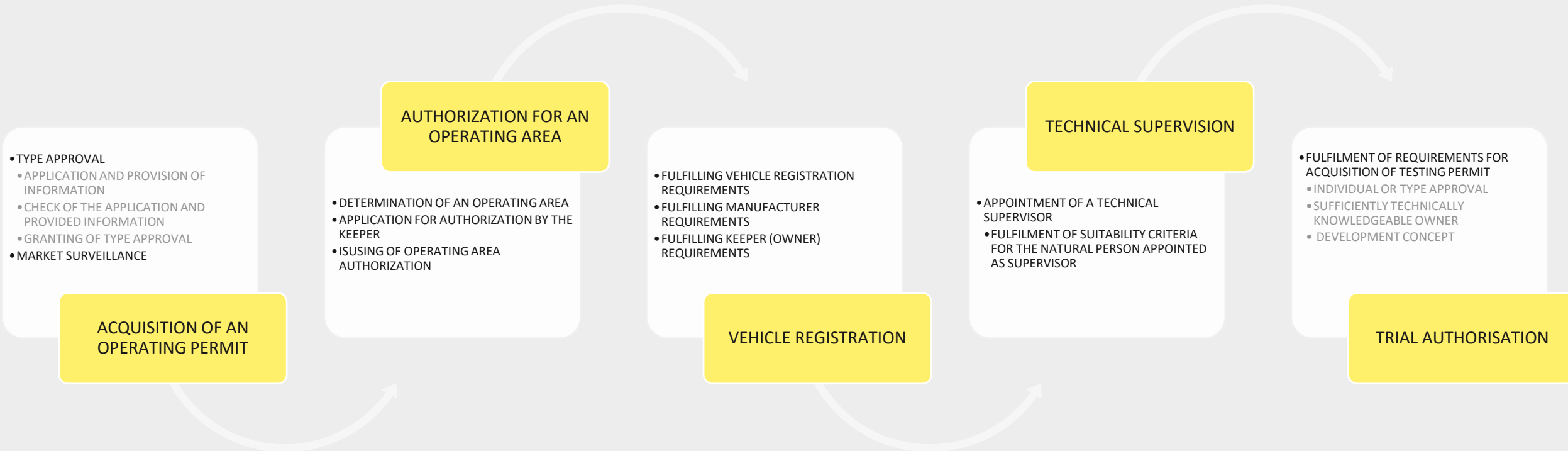
SMALL SERIES & SPV DELEGATED REGULATION

- COMMISSION DELEGATED REGULATION (EU) 2022/2236
- SETS OUT THE TECHNICAL REQUIREMENTS FOR OBTAINING EWVTA FOR FULLY AUTOMATED VEHICLES
- ONCE A FULLY AUTOMATED VEHICLE OBTAINS EWVTA IN ONE EU MEMBER STATE, THIS APPROVAL WILL AUTOMATICALLY BE VALID IN ALL OTHER MEMBER STATES
- ENTERED INTO FORCE ON DECEMBER 6TH 2022



WHILE FOR THE TIME BEING, EWVTA CAN ONLY BE OBTAINED FOR 1500 UNITS OF FULLY AUTOMATED VEHICLES PER MANUFACTURER, BOTH REGULATIONS INCLUDE A COMMITMENT TO ADOPT THE NECESSARY REQUIREMENTS FOR THE EWVTA OF **FULLY AUTOMATED VEHICLES IN UNLIMITED SERIES BY END OF 2024**

Ordinance on the Approval and Operation of Autonomous Vehicles



Ordinance on the Approval and Operation of Autonomous Vehicles

PART I: ACQUISITION OF AN OPERATING PERMIT

- 1. TYPE APPROVAL**
 - A. APPLICATION AND PROVISION OF INFORMATION
 - B. CHECKS OF THE APPLICATION AND PROVIDED INFORMATION
 - C. GRANTING OF TYPE APPROVAL
- 2. MARKET SURVEILLANCE**
 - A. REGULAR CHECKS ENSURING COMPLIANCE WITH THE ORDINANCE

PART III: VEHICLE REGISTRATION(PLACEHOLDER)

- 6. FULFILLING VEHICLE REGISTRATION REQUIREMENTS**
- 7. FULFILLING MANUFACTURER REQUIREMENTS**
- 8. FULFILLING KEEPER REQUIREMENTS**

PART II: DETERMINATION OF AND ACQUISITION OF AUTHORISATION FOR AN OPERATING AREA (OA)

- 3. DETERMINATION OF AN OPERATING AREA**
 - A. DEFINITION OF THE OA BY THE KEEPER
 - B. APPROVAL OF THE OA BY THE COMPETENT AUTHORITY
- 4. APPLICATION FOR APPROVAL OF A DEFINED OPERATING AREA BY THE KEEPER**
- 5. ISSUING OF THE DEFINED OPERATING AREA AUTHORISATION**

PART IV: TECHNICAL SUPERVISION

- 9. APPOINTMENT OF A TECHNICAL SUPERVISOR**
 - A. APPROPRIATE ACADEMIC QUALIFICATIONS
 - B. APPROPRIATE TRAINING PROVIDED BY MANUFACTURER
 - C. VALID DRIVERS' LICENSE
 - D. RELIABILITY WITH REGARD TO PERFORMANCE OF TASKS

Ordinance on the Approval and Operation of Autonomous Vehicles

STEP 3: DETERMINATION OF AN OPERATING AREA

Motor vehicles with an autonomous driving function may only be operated on public roads in an **operating area which has been previously defined and approved (§7 Verordnung)**.

The definition of an operating area is **made by the keeper of the motor vehicle, and then approved by the competent authority** – it may be granted jointly for several identical vehicles, provided that a corresponding type approval is available in each case.

STEP 4: APPLICATION FOR AUTHORISATION BY THE KEEPER

The **application for approval** of a defined operating area must contain (§8(1) Verordnung):

- A concrete **description of the defined operating area**, in particular by depicting a **cartographically limited area**, the purpose of operation and the associated operating conditions
- The declaration by the keeper that the deactivability of the autonomous driving function and the possibility of enabling driving manoeuvres are guaranteed in this operating range
- A declaration that the personal and factual requirements according to §13 and 14 Verordnung are met

The keeper also must submit (§8(2) Verordnung):

- The type approval
- For the keeper (or persons appointed by the keeper) and technical supervisors: a certificate of good conduct for submission to an authority, and information from the driver license register
- Information about the driving aptitude register from technical supervision

Determination of and Acquisition of Authorisation for Defined Operating Area

STEP 5: ISSUING OF AN OPERATING AREA AUTHORISATION

APPROVAL FOR A DEFINED OPERATING AREA WILL BE GRANTED IF (§9(1) VERORDNUNG):

- A **TYPE APPROVAL** FOR A MOTOR VEHICLE WITH AUTONOMOUS DRIVING FUNCTION EXISTS
- THE DEFINED OPERATING IS **SUITABLE FOR THE OPERATION** OF THE MOTOR VEHICLE
- THE **PERSONNEL AND MATERIAL REQUIREMENTS** ACCORDING TO §13 AND 14 VERORDNUNG ARE MET

AN OPERATING AREA IS **SUITABLE** IF THE COMPETENT AUTHORITY DETERMINES THAT (§9(2) VERORDNUNG):

- THE MOTOR VEHICLE CAN **INDEPENDENTLY PERFORM THE DRIVING TASK** IN THIS SPECIFIED OPERATING RANGE ACCORDING TO THE SPECIFICATIONS OF THE OPERATING PERMIT
- THE **ROAD INFRASTRUCTURE MEETS THE TECHNICAL REQUIREMENTS** FOR THE OPERATION OF THE MOTOR VEHICLE ACCORDING TO THE TYPE APPROVAL
- THE **POSSIBILITY OF THE TECHNICAL SUPERVISOR INTERVENING TO DISABLE OR ENABLE MANOEUVRES** IS ENSURED AT ALL TIMES
- THE OPERATION OF THE MOTOR VEHICLE WITH AUTONOMOUS DRIVING FUNCTION IN THIS OPERATING RANGE NEITHER IMPAIRS THE SAFETY AND EASE OF ROAD TRAFFIC NOR ENDANGERS THE LIFE AND LIMB OF PERSONS

THE COMPETENT AUTHORITY MAY ALSO REVOKE OR SUSPEND THE AUTHORISATION OF AN ESTABLISHED AREA OF OPERATION IN CASE THE PREVIOUSLY MENTIONED REQUIREMENTS ARE NO LONGER FULFILLED ACCORDING TO §10 VERORDNUNG

Passenger Transport Licensing Procedure

2021 REFORM OF THE PASSENGER TRANSPORT ACT (PERSONENBEFÖRDERUNGSGESETZ)

- IN MARCH 2021, A REFORM OF THE PASSENGER TRANSPORT ACT (PERSONENBEFORDERUNGSGESETZ – PBEFG) HAS BEEN PASSED TO CREATE A RELIABLE LEGAL FRAMEWORK FOR NEW MOBILITY SERVICES. THE NEW MOBILITY OFFERS OFTEN CANNOT BE CLEARLY ASSIGNED TO THE LEGALLY PRESCRIBED TYPES OF THE PASSENGER TRANSPORT ACT (PBEFG), CREATING A GREY AREA.
- IF NEW MOBILITY SERVICES ARE ALLOWED TO BE APPROVED FOR **PRACTICAL TESTING FOR A MAXIMUM PERIOD OF FIVE YEARS**, THE REQUESTED SERVICE CAN – INSTEAD OF BEING REJECTED – BE APPROVED ACCORDING TO THE TYPE OF TRANSPORT OR FORM OF TRANSPORT TO WHICH IT MOST CLOSELY CORRESPONDS (SO CALLED **MIXED-TYPE SERVICES**).
- UNDER THE PBefG, AN APPLICATION FOR SUCH A SERVICE REQUIRES, INTER ALIA, **ALIGNMENT BETWEEN THE TRANSPORT PROVIDER AND LOCAL AUTHORITY ON THE OPERATING AREA OF THE SERVICE**, WHICH WILL BE THE SUBJECT OF DISCUSSION BETWEEN VERNE AND CITY AUTHORITIES IN THE NEXT STAGE

§2(6) PBefG

IN THE CASE OF CARRIAGE WHICH DOES NOT MEET ALL THE CHARACTERISTICS OF A MODE OF TRANSPORT, A LICENCE MAY BE GRANTED IN ACCORDANCE WITH THOSE PROVISIONS OF THIS ACT WITH WHICH SUCH CARRIAGE MOST CLOSELY CONFORMS.

§2(7) PBefG

FOR THE PURPOSE OF PRACTICAL TESTING OF NEW MODES OF TRANSPORT OR MEANS OF TRANSPORT, THE LICENSING AUTHORITY MAY, ON APPLICATION IN INDIVIDUAL CASES, GRANT DEROGATIONS FROM PROVISIONS OF THIS ACT OR FROM PROVISIONS ISSUED ON THE BASIS OF THIS ACT FOR A MAXIMUM PERIOD OF FIVE YEARS, PROVIDED THAT PUBLIC TRANSPORT INTERESTS DO NOT CONFLICT WITH SUCH DEROGATIONS.

Local Example - Passenger Transport Licensing Principles

- INTRODUCTION OF NEW MOBILITY SERVICES DEPENDENT ON LOCAL/STATE GOVERNMENT, WHO CAN INTRODUCE **VARIOUS CONTROL OPTIONS AND INSTRUMENTS DEPENDING ON THEIR INDIVIDUAL PUBLIC TRANSPORT INTEREST**
- ADMINISTRATIVE GUIDELINE DRAWN UP BY LEIPZIG DEFINES THE CONCEPTS OF PUBLIC TRANSPORT INTEREST AND TRANSPORT EFFICIENCY FOR THE PURPOSES OF FUTURE OCCASIONAL SERVICES
- MIXED-TYPE SERVICES SHOULD COMPLEMENT THE PUBLIC TRANSPORT OFFER, A PRINCIPLE WHICH WILL BE TAKEN INTO ACCOUNT DURING MIXED-TYPE SERVICES:

CONTRIBUTION TO THE PUBLIC TRAFFIC INTEREST

1. CONTRIBUTION TO TRAFFIC EFFICIENCY
2. REQUIREMENTS FOR EMPLOYEES OF MIXED-TYPE SERVICES
3. TECHNICAL AND ORGANIZATIONAL REQUIREMENTS FOR SERVICE OPERATORS
4. DATA EXCHANGE BETWEEN PUBLIC AUTHORITIES AND SERVICE OPERATORS
5. MINIMUM TRANSPORT CHARGES
6. OBLIGATION TO RETURN



Stadt Leipzig

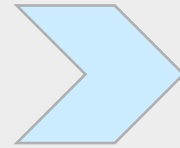
Verwaltungsrichtlinie

zu den Vorgaben für den Gelegenheitsverkehr in der Stadt Leipzig

TYPE APPROVAL



- COMPLIANCE WITH EU & UN REGULATIONS AND DIRECTIVES (~70 REGS, 2500 REQUIREMENTS)
- CONFORMITY OF PRODUCTION REQUIREMENTS MET
- ACQUISITION NATIONAL OR EUROPEAN WHOLE VEHICLE TYPE APPROVAL FOR THE VEHICLE AND ADS



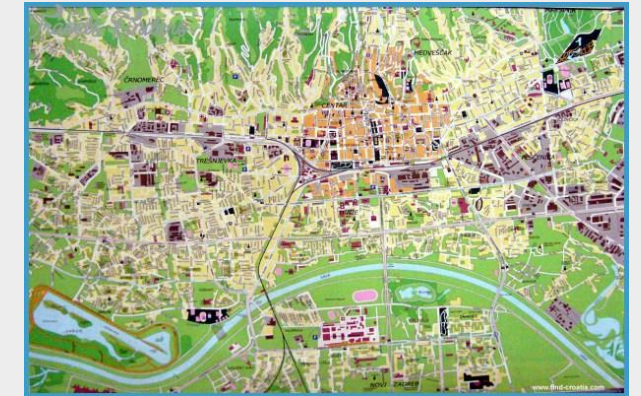
NATIONAL AUTHORISATION



- APPROVAL OF ADS TO OPERATE ON PUBLIC ROADS WITHIN A DEFINED SERVICE AREA
- ACQUISITION OF AN OPERATING PERMIT THROUGH STVG AND AFBGV COMPLIANCE
- FULFILLMENT OF TECHNICAL AND ORGANIZATIONAL FOR THE MANUFACTURER AND OPERATOR



CITY/STATE LICENSING



- PASSENGER TRANSPORT LICENSE TO OPERATE A MIXED TYPE SERVICE
- ALIGNMENT WITH LOCAL/REGIONAL GOVERNMENT ON OPERATING CONDITIONS AND MARKET SUPERVISION

Hvala na pažnji.

Lovro Nobile
Regulatory Expert