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ROAD USER CHARGING IN EUROPE, INFORMATION FOR THE TRANSPORT COMMUNITY COUNTRIES

1ST ROAD TECHNICAL COMMITTEE MEETING
BELGRADE, SERBIA, 12.02.2020

JOSEF A. CZAKO, PRESIDENT & CEO, MOVING FORWARD CONSULTING
EUROPEAN MEMBER OF IRF COMMITTEE ON ITS / ROAD USER CHARGING

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TRANSPORT COMMUNITY

The **Transport Community** comprises of the European Union, Republic of Albania, Bosnia and Herzegovina, Republic of North Macedonia, Kosovo*, Montenegro, Republic of Serbia.

The Transport Community shall be based on the progressive **integration of transport markets** of the South East European Parties into the European Union transport market, on the basis of the relevant acquis, including in the areas of **technical standards, interoperability, safety, security, traffic management, social policy, public procurement and environment**, for all modes of transport excluding air transport.

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AGENDA.

- OVERVIEW IRF, AND MOVING FORWARD CONSULTING
- RUC IN THE EUROPEAN UNION
- CLASSIFICATION AND STRUCTURE OF RUC SCHEMES
- RUC TECHNOLOGIES: DSRC, RFID, ANPR, GNSS, SMARTPHONES
- RUC TECHNOLOGIES SWOT
- EXCELLENCE IN STAKEHOLDER COMMUNICATION
- CONCLUSIONS

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OVERVIEW
INTERNATIONAL ROAD FEDERATION
SHARE, ENGAGE & GROW WITH IRF GLOBAL

THIS PRESENTATION IS POWERED BY BRENDAN HALLEMAN, IRF VICE PRESIDENT

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SEVEN DECADES OF GLOBAL SERVICES

IRF is a **global not-for-profit organization**, founded in 1948 serving a network of public and private sector members in more than 70 countries. We provide world-class **knowledge** resources, **advocacy** services, and continuing **education** programs which together offer a global marketplace for **best practices** and **industry solutions**.

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IRF - WORLDWIDE PRESENCE

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IRF HELPS TO STAY CURRENT IN YOUR FIELD

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For 70 years, an essential part of IRF's mission has been the organization and delivery of continuing education services that help build the skills of road professionals and contribute to the dissemination of knowledge and expertise worldwide.

Classroom training

Study tours

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IRF FOSTERS BEST PRACTICES

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3,000 Highway Professionals attend an IRF Program every year

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IRF SERVES WITH HUGE VARIETY OF DISCIPLINES

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- Performance-Based Contracts
- Procurement & Contract Management
- Toll Collection & Road User Charging
- Construction Supervision
- Ethics & Financial Integrity
- Pavement Design
- Low Volume Road Engineering

- Climate-resilient roads
- Road Safety Audit Team Leaders
- Roadside Safety Management
- Vulnerable Road User Safety
- Workzone Safety
- Speed Enforcement
- Post-Crash Investigation

- Managing Road Assets
- Bridge / Tunnel Inspections
- Roadway Analytics
- ITS Systems Architecture
- Traffic Forecasting
- Congestion Management
- Traffic Signal Control
- …and more …

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IRF ROAD USER CHARGING COMMITTEE

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The chief aim of the **RUC committee** is to offer IRF members an opportunity to **formulate policy** and **technological recommendations** that support informed policy-making and lead to **cost-effective solutions** in those cases where road user charging meets clearly identified **mobility objectives and societal goals**."

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ROAD USER CHARGING – IRF EVENTS

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Ghana study tour to Austria (2018)

e-Tolling expert workshop in Zagreb (2019)

Global leadership seminar on future of road pricing, Las Vegas (2019)

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IRF WHITE PAPER: FUTURE OF ROAD PRICING

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Charging road users is currently experiencing a renaissance thanks to pressing **funding concerns** and the concurrent emergence of a **wider range of technology options**

Road pricing programs affect the travel patterns of hundreds of thousands, and can bring about important **societal benefits** that extend well beyond the funding equation. But these programs also **provide mobility actors** with the opportunity to take advantage of the dynamic data now available to them via new data points, which can provide value outside of traditional charging services, such as in the realm of **road safety, telematics-based insurance, fleet management, or congestion analysis**.

The need to charge according to a growing number of parameters (location, destination, number of occupants) will become even more appealing to **policy-makers**. For drivers, journey time will no longer be the only variable, since frequent trade-offs will need to be made between time and cost, possibly embedded within the vehicle's navigation system.

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STRONG EUROPEAN TEAM

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- ECA Regional operations headquartered in Brussels
- Primary contact point for IRF Members & Fellows in 30+ countries
- Active stakeholders in regional forums (SEETO/TCT, Eastern Partnership Transport Panel, etc.)
- Regional training facility in Zagreb, Croatia

Your Contacts

Brendan Halleman
Vice President, Europe & Central Asia

Tom Antonissen
Senior Advisor

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INTERNATIONAL ROAD FEDERATION

BETTER ROADS. BETTER WORLD.

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OVERVIEW
MOVING FORWARD CONSULTING

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OUR VISION: SUSTAINABLE MOBILITY & TRANSPORT

FOSTER INNOVATIVE, INTEGRATED, SUSTAINABLE, SEAMLESS AND ACCESSIBLE MOBILITY FOR PEOPLE AND GOODS.

SOLVE CHALLENGES OF TODAY AND ENSURE THE FUTURE IN THE AREAS OF FINANCING, EFFICIENCY, ENVIRONMENT, SAFETY, AND SECURITY.

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OUR MISSION: INTELLIGENT TRANSPORTATION SYSTEMS

SMART MOBILITY

SHARED MOBILITY

SAFE MOBILITY

CLEAN MOBILITY

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WHO WE ARE.

- Founded 2015, independent, we serve public and private clients
- Focus on Intelligent Transportation Systems (ITS) applied to road transport, public transport, urban and smart cities, freight & logistics
- Innovation management and deployment in digitalization, automation, electrification, smartphonisation, disruptive technologies
- Long term and global experience flagship projects

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OUR EXPERTISE.

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- **Studies:** Markets, Smart Cities, ITS, traffic safety, transport economy, technology, innovation
- **Policy development**, stakeholder communication, KPI models
- **Urban mobility**: shared mobility, parking, access, dynamic traffic management
- **Road Pricing**: Electronic Toll Collection (ETC), Road User Charging (RUC), Mobility Pricing), PPP and BOT schemes
- **Road Safety** and Security: Violation enforcement of speed, red light, or weight; safety programs, safety certification
- **Freight and logistics**: Fleet management, harbour access, urban last mile delivery
- **Technology and disruptions management**: digitalization, automation, electrification, MaaS, autonomous driving
- **Business development** support: country and market entry, tender support, partner acquisition, project management

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EXPERTISE: ROAD USER CHARGING.

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Electronic Toll Collection

- Electronic Toll Collection (ETC)
- Road User Charging (RUC)
- Mobility Pricing (MP)
- Congestion Charging, City Charging
- Interoperability, European Electronic Toll Service (EETS)

Enforcement

- Toll violations
- speed offences
- red light offences

Technology Application

- DSRC (Microwave)
- RFID (ISO 18000 A/B/C Sticker Tags)
- Satellite/GNSS (GPS, GLONASS, GALILEO)
- 3G/4G/5G Telecommunication networks
- APNR (Video based number-plate recognition)

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SUPPORT OF INTERNATIONAL TRAFFIC & TRANSPORT ASSOCIATIONS.

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- **ASECAP** – Association of European Road Concessionaires, Brussels, Belgium
- **AVENIR MOBILITE**, Zurich, Switzerland
- **ERF** – European Road Federation, Brussels, Belgium
- **EROAD** - Automated road user charging and compliance
- **ERTICO** – ITS Europe, Brussels
- **IBTTA** – International Bridge, Turnpike and Tunnel Association, Washington D.C., USA
- **IRF** – International Road Federation
- **IRU** – International Road Transport Union
- **ITF** – International Transport Forum (OECD)
- **NATIONAL ITS ASSOCIATIONS**
- **POLIS** – Network of European Cities and Regions, Brussels
- **UNECE** – Economic Commission for Europe, Geneva, Switzerland

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REFERENCES (EXTRACT)

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- Automated Driving
- Business Development
- Electric Vehicles
- ITS in Cities
- Mobility as a Service
- Road Pricing: RUC, ETC, e-Vignettes, e-Tolling, Congestion Charging, Managed Lanes
- Road Safety
- Smart Cities
- Traffic Control Center
- Traffic Management

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RUC IN THE EUROPEAN UNION, EUROPEAN LEGISLATION

PRESENTATION POWERED BY PETER SZATMARI, DG MOVE

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TODAY'S CHALLENGES

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EU TRANSPORT POLICY OBJECTIVES

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- Connected Mobility
- Interoperability of electronic road toll and charging systems
- Harmonisation of technologies and interfaces
- Cross-border enforcement

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OBJECTIVES OF THE EXISTING LEGISLATION (PRICING)

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- **Elimination of distortions of competition** between transport undertakings in the Member States
- **Fairer system of charging**, based on the **'user pays' and 'polluter pays'** principles
- Recovery of **infrastructure costs**
- Promotion of **sustainable transport** and reducing negative impacts of transport

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EXISTING CHARGING SYSTEMS IN THE EU: HEAVY DUTY VEHICLES

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EXISTING CHARGING SYSTEMS IN THE EU: LIGHT VEHICLES

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TOLL VARIATION – EXISTING PRACTICES

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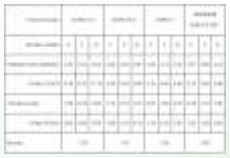

Revenue neutral variation of charge to address congestion: The Czech Republic applies it on its tolled network (Friday afternoons, HGVs only) – shifted 15% of HGV traffic to less congested hours

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EU ROAD PRICING LEGISLATION

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- **DIRECTIVE 1999/62/EC** on the charging of heavy goods vehicles for the use of certain infrastructures, consolidated version including updates of maximum amounts
  https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01999L0062-20180701&from=EN
- **DIRECTIVE 2006/38/EC** amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures
  https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0038&from=EN
- **DIRECTIVE 2011/76/EU** amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011L0076

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MAIN OBJECTIVES OF THE REVISION (1)

31

- **Simplify/clarify existing rules**
- Contribute to **Paris Agreement** and the **2030 goals** through a reduction of CO2 emissions from road transport
- Progress on the application of the **polluter pays** and **user pays principles**, incl. contribution to infrastructure financing, the quality of roads

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MAIN OBJECTIVES OF THE REVISION (2)

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Scope extension: for the first time, EU legislation would cover:

- Buses and coaches (similar rules to trucks)
- Light vehicles (cars, vans, minibuses):
  - Proportionality of the price of short term vignettes
  - Certain general tolling principles (e.g. emission-based variation)

Choice of charging instrument

- Phase out vignettes for HGV and bus/coach by 2023
- Phase out vignettes for LDVs (van, minibus, passenger car) by 2027

Possibility to reduce vehicle tax (HGVs>12t)

- Minimum vehicle tax levels gradually removed

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COMMISSION PROPOSAL: TOLL VARIATION

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A. ENVIRONMENTAL PERFORMANCE

- HDVs:
  - CO2 instead of EURO for revenue-neutral variation of infra charge
  - Easier but compulsory external-cost charges (pollution and noise)
- Cars and vans:
  - Variation based on CO2 and real-driving pollutant emissions
- Toll reduction (75%) for zero emission vehicles

B. DEALING WITH CONGESTION

New possibility of congestion charging on top of the infrastructure charge on the main inter-urban network (instead of revenue-neutral variation for trucks only):

- For all vehicles
- Capped and can be applied only on congested roads

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COMMISSION PROPOSAL: INVESTMENT IN INFRASTRUCTURE

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TODAY

Earmarking of revenues only from **mark-ups** of 15-25% (only in mountainous regions)

- Applied by Austria and by Slovenia to finance the Brenner Base Tunnel and the upgrade of the Koper-Divača rail link, respectively

PROPOSAL

- Possibility to apply **mark-ups outside mountain areas**
- **Earmarking of revenues** from mark-ups and congestion charges to develop transport infrastructure and services
- Enhanced reporting requirement

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POLICY OBJECTIVES EUROPEAN ELECTRONIC TOLL SERVICE (EETS)

35

- Access to EETS market
- Interoperability of electronic road toll systems
- Harmonisation of technologies and interfaces
- Cross-border enforcement (new)

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STATE OF LEGISLATIVE PROCESS - EUROVIGNETTE

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Commission proposal in May 2017

European Parliament report adopted in Oct 2018 – going beyond COM proposal:

- actually replacing vignettes by tolls for all vehicles
- mandatory external cost charging on toll roads for all vehicles from 2026
- earmark all revenues to transport infrastructure and services

Council

- Different views in Council
- Limited progress for 1,5 year
- **RO Presidency: restarted the discussions on the Eurovignette Directive**
- **FI Presidency: objective to reach a general approach**

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EU LEGISLATION - EETS

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- **Directive (EU) 2019/520 of 19 March 2019** on the interoperability of electronic road toll systems and facilitating cross-border exchange of information on the failure to pay road fees in the Union (RECAST): https://eur-lex.europa.eu/eli/dir/2019/520/oj
- Applies in all Member States of the EU as of **19 October 2021**
- **Repeals** Directive 2004/52/EC and Decision 2009/750/EC which are currently in force
- Implementing and Delegated Acts still to be adopted by COM during 2019 will also apply as of **19 October 2021**

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TECHNOLOGIES IN EETS

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- 3 main technologies for Electronic road toll systems using an On Board Equipment (OBE)
  - Satellite positioning
  - Mobile communications
  - 5,8GHz microwave technology
- The scope of the legislation is extended to video tolling systems (ANPR)
- Users will have one counterpart (the EETS provider) to pay any electronic toll, whatever the technology applied
- EETS allowed, until 2027, to serve cars with simple and cheap DSRC OBE
- Other technologies allowed for local projects, e.g. RFID, 5G, V2X

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CROSS-BORDER ENFORCEMENT

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- **Applies to all kinds of tolling**, also time-based systems, light vehicles etc.
- **Automatic mechanism for the exchange, between Member States, of information on the identity of the owners or holders of vehicles for which a toll is suspected of not having been paid**: with this information, Member States will be able to follow up cases of tolls not paid by non-resident drivers
- **Simple system of exchange of information**: To reduce costs and administrative burden, the mechanism used will be the same as for the exchange of information on road-safety-related traffic offenses

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EXPECTED IMPACTS

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Main benefits:

- Savings for road users (predominantly for heavy vehicles): reduced compliance cost and burden
- Savings for toll chargers: less OBE to be procured for purely national purposes
- Better enforcement of tolls from foreign offenders: €150 million additional revenues per year.

Main costs:

- Investment by toll chargers in upgrading interfaces to harmonised standards

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CLASSIFICATION AND STRUCTURE OF RUC SCHEMES

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EVOLUTION OF CHARGING

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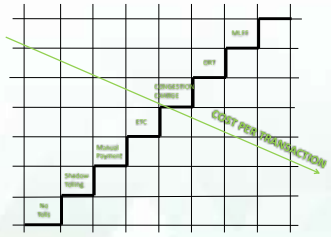

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EVOLUTION OF PAYMENT MODES

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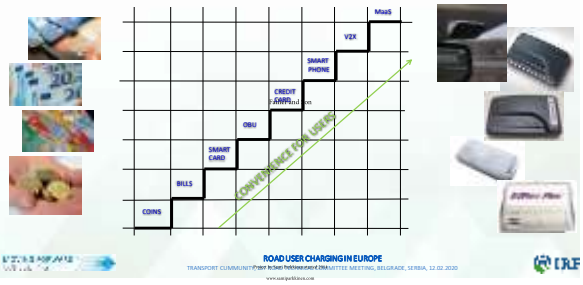

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RUC SYSTEM STRUCTURE

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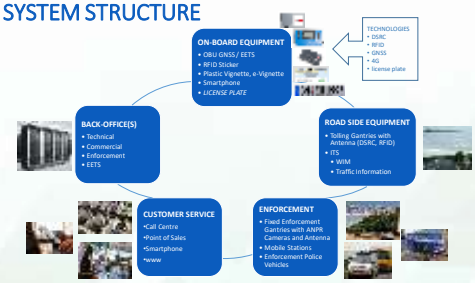

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SUSTAINABLE TARIFFS (PRICING)

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PARAMETERS	DISTANCE	TIME OF DAY	PLACE	VEHICLE	USER	DEMAND	EMISSIONS
STATIC	• SEGMENTS DRIVEN • KM DRIVEN	• RUSH HOUR	• HIGHWAY • CITY • HOSPITAL • SCHOOL	• AXLES, TRAILER • WEIGHT • EMISSION CLASS • ELECTRIC / CLEAN	• TRIP PURPOSE • PEOPLE IN CAR	• FASTEST ROUTE • SHORTEST • "BEST" (SUSTAINABLE)	
HISTORICAL	• COST OF INFRASTRUCTURE		• TOURISTIC LANDSCAPE • DANGEROUS			• TRAFFIC VOLUME • CONGESTION LEVEL	
DYNAMIC		• NOT DURING RUSH HOUR			INTERMODAL TRIP WITH PUBLIC TRANSPORT	• SPORT EVENTS • LEVEL OF SERVICE • CONSIDER ROAD CAPACITY	• ENERGY USE • AIRQUALITY • NOISE • OTHER EXTERNAL COST
SUSTAINABILITY	**	**	*	**	***	***	***

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RUC TECHNOLOGIES: DSRC, RFID, ANPR, GNSS, SMARTPHONES

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WORLDWIDE USAGE OF RUC TECHNOLOGIES

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RUC TECHNOLOGIES SWOT, FINANCIAL IMPLICATIONS

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RUC TECHNOLOGIES SUITABILITY (HIGH LEVEL APPROACH)

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SUITABILITY / TECHNOLOGY	DSRC 5.8 GHZ	RFID	ANPR	GNSS	SMARTPHONE
OBE price	€10	€1	License Plate	€100+	€200+
OBE requires battery	yes	no	no	no	yes
Road-side infrastructure needed	tolling & enforcement	tolling & enforcement	enforcement	enforcement	enforcement
Suitable for ETC/Charging/Pricing	y-y-n	y-y-n	y-y-n	y-y-y	y-y-y
Suitable for full distance-based tariffs	yes	yes	weather dependant	yes	yes
Interoperability	Yes	yes	limited	yes	yes
Charging of huge networks	cost of infrastructure	cost of infrastructure	cost of infrastructure	yes	yes
Worldwide usage in charging	partly	yes	no	yes	limited
Future proof	Limited	good	good	5G, V2X	very good
Privacy level	yes	yes	yes	Tracking issues	Tracking issues
Security level	high	high	low	medium	medium
Reliability of technology	good	good	fraudulent plates	network coverage	network coverage
High quality digital maps required	no	no	no	yes	yes

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TECHNOLOGIES, FINANCIAL IMPLICATIONS

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TECHNOLOGY [13] FINANCIAL IMPACTS	DSRC 5.8 GHz	RFID	ANPR	GNSS	SMART-PHONE
Cost for the user	medium [1]	low [2]	None	high [4]	service fee [6]
Cost for the system operator	medium [11]	lower than DSRC [2]	higher than RFID [3]	complexity [5]	low [12]
Revenue security for operator	High	High	Good [8]	Good [9] [10]	limitations [7]

http://digital.itsinternational.com/2019/global/sept-oct/html5/index.html?pn=33

NOTES
(1) Typically €8-10 ■ (2) Typically less than €1 ■ (3) Higher cost, because of more complex back office processing of license plates ■ (4) Typically €200-300 ■ (5) Due to high system complexity ■ (6) Smartphone not included ■ (7) Depends on smartphone network availability; also, operational issues exist ■ (8) Weather dependent, thus not suitable for fully distance-based tariffs ■ (9) Higher cost per transaction ■ (10) Depends on quality of the GNSS-position provided; also, issues exist in skyscraper cities, tunnels or underground roads ■ (11) Higher cost for infrastructure, OBU distribution logistics; and need of battery replacements ■ (12) Low costs for operator because: 1) no specific road side infrastructure required; 2) multiple usage of smartphone and 3) use of GSM network ■ (13) Technology is capable to independently perform ETC/RUC/mobility pricing

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EXCELLENCE IN COMMUNICATION WITH ALL RUC STAKEHOLDERS ENSURES PROJECT SUCCESS

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THE „ART" OF COMMUNICATION FOR RUC PROJECTS

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- Policy to be sustainable and fair
- Requires intensive, continuous, and stakeholder specific communication and dialogue
- Must be based on understandable arguments and facts to be used to discuss and explain advantages
- Communication is required during all project phases: policy, legislation, financing, planning, tender, selection, implementation, operation, updates
- Specific communication is required, e.g.
  - for completely new projects
  - for change from traditional tolling to electronic toll collection
  - For satellite-based tolling
  - For LVs or HVs
  - Etc.

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ALL STAKEHOLDERS TO BE INCLUDED

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ALL QUESTIONS NEED SUSTAINABLE ANSWERS

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COMPLEX AND VARIETY OF QUESTIONS

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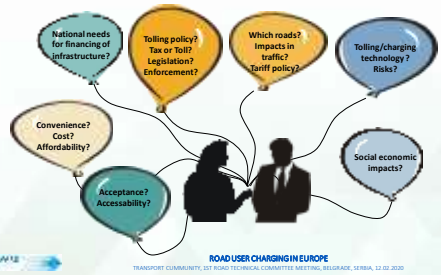

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QUESTIONS FROM VARIOUS USER GROUPS

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ADVANTAGES OF THE "PAY-AS-YOU-DRIVE" PRINCIPLE

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1. The users, rather than the taxpayers, are to pay according to their actual use of the infrastructure, only
   - Little use of toll roads = little payments
   - Drive a lot on the toll road = higher payments
2. The user pays principle is fair, proportional, and non-discriminatory
3. The principle replaces distortionary taxes and subsidies by fair pricing

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ADVANTAGES OF THE POLLUTER-PAYS PRINCIPLE?

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1. According to EU Treaty 191/2, the polluter-pays principle is to increase sustainability of mobility and transport
2. The polluter-pays principle also recommended by OECD
3. The polluter-pays principle reduces the environmental impacts of air pollution, congestion, or noise caused by transport
4. Many positive examples in HGV toll schemes by fostering lower emission vehicles

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WHY TO PAY MORE (TAXES) TO USE THE ROAD?

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Public budgets are more and more unable to finance the initial investment, extensions, upgrades, maintenance, …

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ADVANTAGES OF RUC FOR THE AUTHORITY

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1. RUC fosters long term and sustainable financing of road infrastructure: construction, maintenance, upgrades
2. Thus reducing bottlenecks of tax based financing
3. Sustainable tariffs (Road Pricing) fosters sustainable mobility: better efficiency with less congestion, less accidents, better environmental protection
4. Transparency in fee collection

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USE OF REVENUES FROM RUC SCHEMES ?

61

1. Invest into better road quality
   → higher road safety
2. Intelligent traffic management
   → reduce congestion
3. Adaptive maintenance (winter, road surface)
4. Better information and signage for drivers
   → travel times, accidents
5. Invest into rest areas

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CAN REVENUES FROM RUC BE EARMARKED?

62

1. Earmarking is possible by a respective political will and majority vote.
2. Earmarking shall be exactly defined, e.g. for extensions, maintenance, safety.

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IS MY PRIVACY ENSURED?

63

1. General Data Protection Regulation (GDPR) ensures proper privacy deployment on national and European levels
2. Data Subject Rights : breach, access, forgotten, portability, officers and enforcement, design
3. Increased territorial scope
4. Penalties
5. Consent

https://eugdpr.or

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COST COMPARISON FOR VARIOUS RUC TECHNOLOGIES?

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1. During design phase, technology alternatives and impacts for investment, operation and maintenance
2. Analysis of actual cost for toll collection (for existing schemes)
3. Digitalization and automation offer higher convenience for users and cost savings for operation
4. Return on investment to consider also social economic savings:
   a. Lower congestion
   b. Less accidents and fatalities
   c. Reduced external cost: pollution, noise
   d. Enhanced quality of network requires less vehicle repairs and maintenance

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HOW CAN I REGISTER AND PAY ?

65

Registration and payment are possible via:

- Gas stations
- POS
- Service terminals
- Via the www
- Smart phone apps
- Retail stores
- …

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HOW WILL I PAY IN FREE-FLOW RUC SCHEMES ?

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In free-flow RUC systems, the fees are paid cashless without stopping at toll plazas, by:

1. Pre-payment to my toll account
2. Post-payment of the monthly bill of my toll account via my bank, credit card, debit card, etc.

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WILL RUC HARM THE BUSINESSES ?

67

1. Tolled roads offer better traffic flow and thus reduce travel times
2. Tolled motorways are safer (Asecap, IBTTA, IRF)
3. Inter-modality fosters use of public transport (Stockholm, Milan, London), thus increase of quality in city centres

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WILL INTERNATIONAL USERS ALSO CONTRIBUTE AND PAY ?

68

1. All users to pay the same charges for using the infrastructure
2. This applies to both, to national and international users.
3. Thus, all users contribute to the financing of road infrastructure

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SHOULD THE CHARGE BE A TAX OR A FEE ?

69

1. Both alternatives depend on the political will and the financing policy
2. Taxes contribute to common tax incomes of a country; it is possible to earmark to finance road infrastructure
3. Charges via toll fees usually serve a dedicated purpose as agreed in the national toll collection legislation

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NEGATIVE EXAMPLES OF INSUFFICIENT COMMUNICATION

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ROAD RAGE AS ALBANIA INTRODUCES TOLL ON KOSOVO HIGHWAY

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RAGES IN FRANCE - ECOTAX PROJECT

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History:

- 2014 … abandoned
- 2016 … the Court of Auditors says 'a mess' that will damage the public finances ….
- 2017 … French regions want new initiative for ecotax project
- 2020 … ?

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CONCLUSIONS

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PROJECT SUCCESS CREATED IN VARIOUS PHASES

Planning	Launch	Operation	Extensions
• Agreement on policy, system design, financing, legislation, interoperability, … • Common sense between government, users, professional associations • Professional and fair tender, selection, agreements	• Intensive test of all system portions • Sufficient training of management and staff • Good communication about value of ETC scheme to all stakeholders • Additional staff during launch phase • Dynamic reporting system	• Highest operational quality & reporting • Excellent customer service • Proper invoicing • Vehicle registration databases are up to date • Friendly but efficient enforcement • Fraud prevention	• Highest operational quality & reporting • Excellent customer service • Proper invoicing • Vehicle registration databases are up to date • Friendly but efficient enforcement • Fraud prevention

Excellent management & team
Continuous communication and respect to feedback of users
Continuous improvements

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TECHNOLOGIES HELP TO SOLVE CHARGING ISSUES

ISSUE	SOLUTION
NEED TO SLOW DOWN OR STOP AT TOLL PLAZAS, SEPARATED LANES	MULTI-LANE & FREE-FLOW (MLFF), OPEN ROAD TOLLING (ORT)
DIFFICULT PAYMENT ALTERNATIVES: (EXACT) CASH, PRE-PAY, POST-PAY, CREDIT CARD,	CASHLESS PAYMENT
DIFFICULT REGISTRATION PROCESS, OBU PURCHASE	DIGITALIZATION, SMARTPHONES
COMPLICATED TARIFFS: TIME, BASED, DISTANCE BASED, TICKETS, HOV, HOT	ROAD PRICING / MOBILITY PRICING
LACK OF (EUROPEAN) INTEROPERABILITY	COMMON EUROPEAN POLICIES, EETS
HEAVY ROADSIDE INFRASTRUCTURE	SATELLITE BASED TOLLING: GNSS, ITS UNITS, SMARTPHONES
POOR CUSTOMER SERVICE	INCREASE OF SERVICE QUALITY
PRIVACY ISSUES	HONOR GDPR

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IMPORTANT RECOMMENDATIONS

1. Consider national policies and future requirements
2. Create powerful communication and information exchange between all stakeholders
3. Select mode of operation, payment, and proven technologies not cause congestion by the RUC scheme
4. Ensure common system architecture for RUC, ITS, Road Safety and BEST investment and operational cost
5. Create affordable tariffs to serve financing AND sustainability
6. Implement an efficient enforcement regime to ensure incomes
7. Ensure interoperability to your neighbours and into Europe
8. Consider inter-urban and urban charging platforms
9. Ensure scalability, growth, technology disruptions

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EUROPEAN RUC FOSTERS SUSTAINABILITY

1. RUC & ETC schemes foster sustainable financing of road infrastructure for construction and maintenance
2. The user-pays and polluter-pays principles support sustainability: reduction of congestion, better travel times, higher road safety
3. European legislation eases project planning and implementation, interoperability, and cross border enforcement

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SALUS POPULI SUPREMA LEX ESTO.

WELL BEING OF THE PEOPLE TO BE THE SUPREME LAW.

Marcus Tullius Cicero, 106-45 BC
Roman statesman, orator, lawyer and philosopher

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QUESTIONS
DISCUSSION
APPLICABILITY
FOR PROJECTS YOUR COUNTRY

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THANK YOU !

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