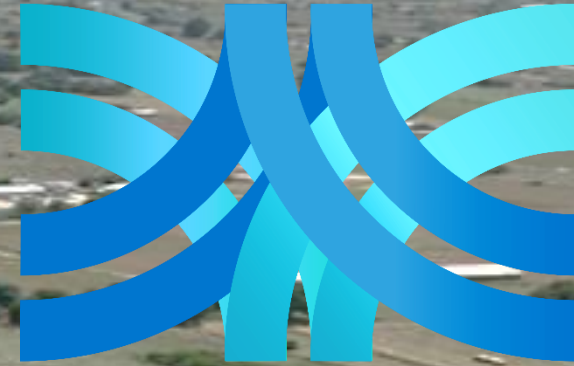


ASECAP DAYS



COSTA NAVARINO 2019

47TH ASECAP STUDY & INFORMATION DAYS

*The road towards free flow ETC in Greece. Current and future challenges
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Contents

- 1. Current Motorway & Tolling Context in Greece**
- 2. Foreseen Changes by the Greek State in Tolling – Objectives**
- 3. Foreseen Changes by the Greek State in Tolling - Characteristics**
- 4. Foreseen Changes by the Greek State in Tolling - Concerns/Questions**
- 5. The Alternative proposal for the road towards Free Flow – Basic Concept**
- 6. The Alternative proposal for the road towards Free Flow – Phasing**
- 7. Conclusions**
- 8. Annex – The Hybrid Toll System Concept**

Current Motorway & Tolling Context in Greece (1/2)

- **Total length** of the Toll Motorway Network is **2.133,2 km**
- **Operated by 7 Private companies** (AO, Gefyra, AMSA, NO, KO, Moreas, &OO) through specific Concession Contracts & **1 Public Company (EO)**, which is also under privatization
- **Tolling Policy**
 - The Tolling System is an **open (rather zonal) system**, comprising Mainline Toll Stations (every 30-40km) & Ramp Toll Stations on selected exits & entrances. Closed system with manual toll collection was not feasible due to dense interchanges (space restrictions, unreasonably high costs for capex & opex, ...)
 - The toll stations provide **manual toll payment** capability, as well as **electronic payment with ETC transponders**. There are currently **46 Mainline and 99 Ramp Toll Stations** (780 toll gates, of which 491 are ETC or of mixed operation (manual / ETC)).
- **ETC payment : only in the 7 Concessions, with over 831.000 DSRC ETC Vehicles and average ETC penetration exceeding 30%**
- **2 ETC Interoperability Schemes:**
 - AO, AMSA, GEFYRA, OO, MOREAS: **~743km, ~746.000 tags**
 - NO & KO: **~503km, ~85.000 tags**
- **EO ~887km**
 - No DSRC ETC
 - Today 13 Toll Stations, to increase to ~40



Current Motorway & Tolling Context in Greece (2/2)

- The annual toll revenue from all motorways in 2018 reached 820 million Euros (incl. VAT) and is going to increase significantly in the forthcoming years because of the further development of tolling in EO
- This revenue is collected by 263,4 million individual toll transactions (88% Light Vehicles and 12% Heavy Vehicles)
- The **number of violations today is at a very marginal level (<0,5%)** thanks to the existence of the barriers in combination with a strict preventive enforcement legal framework according which toll violation is severely punishable traffic code violation.
- Thus, revenue and financial stability for both public and private motorway sector is currently fully secured (Collectability)

Potential Improvements/Perspectives under the Existing Scheme

- **Distance Based Charging through Hybrid System** (combination of existing toll plazas with barriers and free flow DSRC ETC gantries resulting to a closed and fully proportional charging system for ETC subscribers)- **Already being implemented in Olympia Odos**
- **Full interoperability between 2 existing schemes**



Foreseen Changes by the Greek State in Tolling (1/3)- Objectives

The Greek State is willing to develop a new Nation Wide Free Flow Toll Collection System (and for that purpose has launched a relevant tender) with the following objectives:

- **Fully proportionate Electronic Distance Based Tolling**
- **Interoperability, one tag one contract**
- **Free flow tolling without toll plazas**
- **Improved level of service for users**
- **Control of Commercial Traffic for Safety, Security and Smuggling, and enforcement in banned or parallel local network.**
- **Compliance to EU Directives for Interoperability and Data protection**
- **Acceptance of European Electronic Toll Service providers**

Foreseen Changes by the Greek State in Tolling (2/3)- Characteristics

Key characteristics :

- For **Private Vehicles: Video Tolling** using Automatic Number Plate Recognition cameras in all motorway entry/exit points **combined with RFID (ISO 18000-C/B) on board units (sticker tags)**
- For **Commercial Vehicles including Light Commercial Vehicles (not only Heavy Vehicles)**: all vehicles equipped with **GNSS (Satellite) OBU**
- **Existing Systems and toll plazas to be gradually dismantled**
- **Existing ETC systems, customer base and OBU's not used**
- New **State Managed National GNSS Issuer** and Video Tolling Service Provider are created
- Enforcement performed by Traffic Police
- All foreign vehicles entering country must register at ports / border crossings

Foreseen Changes by the Greek State in Tolling (3/3)- Concerns/Questions

- **The fundamental Concessionaire's right (and obligation) under the Concession Agreements to impose and collect tolls with a system of their choice and control in terms of design, implementation, maintenance and operation is practically removed.**
- From the available information, **it seems that the Greek State takes direct control** (and thus responsibility also) of toll collection from Concessionaires, **but it is totally unclear who (and how) finally collects the tolls.** In any case **it is impossible to allocate/ share the risk of toll collection between the State and Concessionaires with such a mixed scheme** (ie different parties design, select, implement, maintain, operate the system and perform the enforcement)
- **Significant drastic changes of Concession Contracts are required**, with complex and lengthy re-negotiations and ratifications
- **Regardless of the pre mentioned concerns the proposed system introduces significant risks of Revenue Collectability, which do not exist today (820million €/year collected with almost zero violation)**
 - By removing physical barriers **violations will increase** (both from users doing it on purpose and those that do it by omission) **and due to their increased level it will be practically unmanageable to process**, regardless of size or the nature (public-private, police, tax authorities or other) of enforcement mechanism
 - Inherent **difficulties of an ANPR based system with absence of a single framework** allowing for the identification of all **license plates** (which are often outdated, poorly maintained, in certain cases forged, unrecognizable or completely absent) and **lack of a central license plate database** that would allow for each vehicle to be associated with the actual owner
 - Collection from **foreign users**
 - **Non- existent enforcement legislation**, framework, mechanism and procedures **for free flow**
- **Other issues:**
 - **Existing DSRC systems, infrastructure, subscriber base and relevant investments are not taken advantage of**
 - **Unclear migration** phase to ensure continuous level of service to users and avoid service disruptions

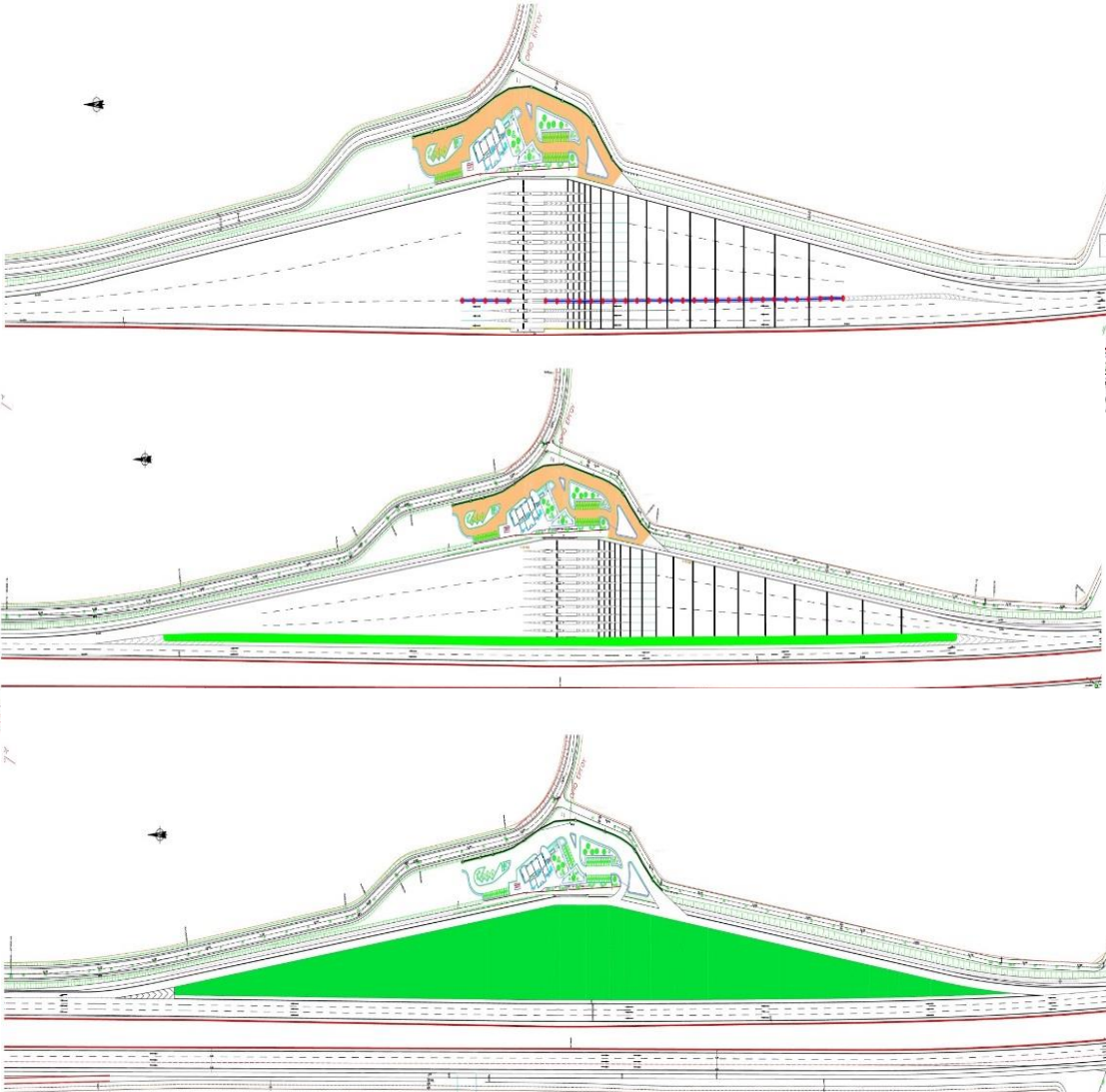
The Alternative proposal for the road towards Free Flow (1/2) – Basic Concept

However, despite the pre-mentioned concerns **it's possible to achieve the same key State objectives towards a modern Free Flow Toll System by evolving rather than dismantling existing systems and contracts by considering a more gradual & sustainable evolution to free flow.**

How?

- **Fully proportionate distance based charging for all vehicles can be achieved through Hybrid Toll System (ref relevant Annex here in),**
 - that takes advantage of existing Toll Plaza infrastructure & ETC customer base,
 - increases ETC penetration and improves in Level of Service,
 - does not increase the risk for toll evasion and does not require an enforcement mechanism,
 - doesn't require major contractual changes (requires only financial model updates for impact on revenues against open system in some cases)
 - paves the way for MLFF following necessary contractual and legal arrangements
 - infrastructure (ETC gantries) can be re-used in case of migration to MLFF
- **Full Interoperability** is a simple contractual/commercial matter between the 2 existing interoperability schemes
- **For commercial vehicles to implement the Satellite System as foreseen by the State with the single OBU for all commercial vehicles to be used as follows:**
 - **Toll Collection by Concessionaires for all vehicles via DSRC**, with State and EETS OBU Issuers connected to existing Interoperability Schemes
 - **Safety, Security and Smuggling –banned network Control by State via GNSS/GSM** components of OBU's

The Alternative Proposal for the road towards Free Flow (2/2) - Phasing



Phase 1: Hybrid Toll System

- Existing Toll Plazas remain unchanged & Hybrid Gantries installed
- Distance based charging for ETC users & Promotion of ETC
- Preparation of legal and other framework for free flow operation, including contractual negotiations/arrangements with the concessionaires as regards the impact of the distance based charging versus existing status (open system) and guarantee of lost revenue from violations
- Commercial Vehicles equipped with GNSS/DSRC/GSM OBU's to be read by DSRC for toll collection

Phase 2: Free flow for ETC users only (with rebate model)

- **Dedicated free flow lanes gradually created in pilot existing toll plazas**
- **Enforcement mechanism trial and evaluation**
- Promotion of ETC continues along with gradual reduction of level of service in cash lanes
- Following success of enforcement mechanism and reduction of violations to acceptable levels dedicated free flow ETC lanes created in all plazas

Phase 3: Free flow ETC for all (with origin-destination model)

- Ramp ETC gantries in all interchanges
- Mainline gantries in place of all mainline plazas
- **Mandatory equipping of all vehicles with transponders**
- Conventional toll plazas are dismantled
- Multi Lane Free Flow distance based system

Conclusions

The implementation of the alternative approach with the Hybrid System (phase 1):

- ✓ Ensures fast-track implementation of distance based charging
- ✓ Builds and expands on existing investments and customer base
- ✓ Does not disrupt the stability of the Concessions & minimizes the required contractual amendments (ie revenue impact from distance based scheme and undertaking by the State as regards to the violations for next free flow phases)
- ✓ Paves the way for eventual smooth evolution towards a free flow ETC system
- ✓ Combines :
 - Tolling via DSRC for all vehicles by Concessionaires
 - Safety, Security and Smuggling – banned network Control of Commercial Vehicles by State via GNSS

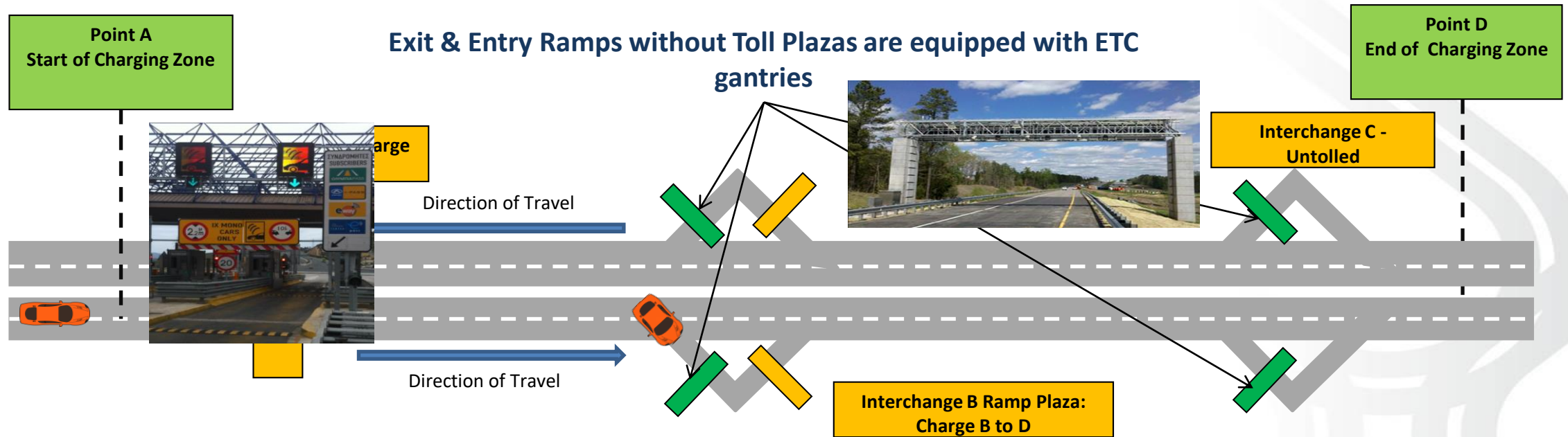
And the gradual implementation of Free Flow (phase 2 & 3) subject to the necessary preparation (legal & contractual arrangements and testing of enforcement mechanism)

- ✓ Minimizes the resources and needs for toll enforcement, since free flow is implemented after all vehicles are equipped with transponders and enforcement mechanism and procedures have been validated at a pilot stage
- ✓ Minimizes the risks of revenue collectability

The proposed alternative approach is the fastest, most economic and realistic approach in order to achieve the key State's objectives, while at the same time protecting the stability of the Concessions and maintaining the high level of toll collectability and level of service

Annex – The Hybrid Toll System Concept

The “Hybrid Toll System” combines existing toll plazas with barriers and free flow DSRC ETC gantries resulting to a closed and fully proportional charging system for ETC subscribers



Vehicle enters from mainline Toll Plaza ETC lane, is charged for distance **A to D**, but travels ONLY part of charging zone **A to B**

When Vehicle exits at Interchange B, ETC gantry records the vehicle & tag

The System matches the transaction from the Mainline Plaza with the passage recorded from the ETC Gantry, and generates a rebate (credit) to the user's ETC account equal to the distance not travelled **B to D**. Final Toll Paid = **(A to D) – (B to D) = A to B** i.e. actual distance travelled

Thank you for your attention

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