Toll Road PPP’s: A tool for Innovation Promoting Cost-Efficiency through High-Quality Pavements

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Roads are used to move the majority of people and freight across Europe:

72% of passenger traffic is moved by car.
45% of freight is moved by trucks.

Road Network requires big investments.

State budgets are limited. A proven alternative is road Concessions.

**A Concession is a kind of Public–Private Partnership (PPP) under which a public authority (Concession Authority) grants specific long term rights to a private or semi-public organization (Concessionaire), to construct, overhaul, maintain and operate an infrastructure (\(\ast\)).**

\(\ast\) Evaluation and future of road toll concession, Pricewaterhouse Coopers for ASECAP, November 2014
Attiki Odos
Rio – Antirio bridge
Egnatia Odos
Nea Odos
Moreas
Aegean
Olympia Odos
Kentriki Odos
The Greek Toll Road Network

7 Private companies / Concessionaires

- Attiki Odos (Attica Tollway)
- Gefyra (Rion – Antirion Bridge)
- Nea Odos
- Moreas Motorway
- Aegean Motorway
- Olympia Odos
- Kentriki Odos

1 Public Company

- Egnatia Odos
Objectives and Goals of HELLASTRON

HELLASTRON is a professional, scientific, educational and research association and operates on a non-for-profit basis. Indicatively, the objectives of HELLASTRON are:

- In relation to the users: the continuous improvement of the services provided to the users of toll roads.
- In relation to the research and public benefit: the investigation, promotion and development of the scientific aspects related to road transportation, Road Pavement, construction and maintenance of roads and networks.
- In relation to the promotion of road transportation: the participation in similar associations, worldwide.
- In relation to the interests of the members of the Company: the protection and promotion of the interests of the toll road infrastructures sector.

(Excerpts from the Association’s Bylaws)
## HELLASTRON - Key Figures (2016)

<table>
<thead>
<tr>
<th>Code</th>
<th>2016 Data</th>
<th>Egnatia Odos</th>
<th>Attiki Odos</th>
<th>Olympia Odos</th>
<th>Moreas</th>
<th>Aegean Motorway</th>
<th>Kentriki Odos</th>
<th>Nea Odos</th>
<th>Gefyra</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td>INFO 1</td>
<td>Total Network Length (km)</td>
<td>885,3</td>
<td>70</td>
<td>202,3</td>
<td>205</td>
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<td>950</td>
<td>2,539</td>
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<td>757</td>
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<td>950</td>
<td>455</td>
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<td>469</td>
<td>119</td>
<td>321</td>
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<td>TOLL 1</td>
<td>Total Number of Toll Transactions (in millions)</td>
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<td>77,04</td>
<td>34,29</td>
<td>16,42</td>
<td>21,26</td>
<td>7,17</td>
<td>24,18</td>
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<td>REV 1</td>
<td>Annual Toll Revenues (mil €, without VAT)</td>
<td>56,70</td>
<td>170,65</td>
<td>65,85</td>
<td>30,75</td>
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<td>11,60</td>
<td>76,05</td>
<td>36,33</td>
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<td>TRAF 3</td>
<td>Heavy Good Vehicles Percentage (%)</td>
<td>14,7</td>
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<td>TRAF 4</td>
<td>Vehicle Kilometers Travelled (mil)</td>
<td>2.930</td>
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<td>173</td>
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</table>
ASECAP - Members

ASECAP Total Network: 50846.81 km
Pavements: Life Cycle and affecting factors

Pavement Condition deteriorates over the lifetime of the pavement because of specific affecting factors.

Factors affecting pavement deterioration

Traffic flow + Low availability of funds → Increasing deterioration rate
**Pavement Life Cycle**

Typical Pavement Life-Cycle

*Ground Zero*

Deterioration over time at an ever-increasing rate
When it’s time to intervene for improving pavement condition?
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When it’s time to intervene for improving pavement condition?
So, it is not easy to answer, before considering...

- What is the size of the pavement network?
- What condition is it in?
- How fast is it deteriorating?
- When do we need to perform repairs to maximize pavement life?
- Where should we focus our maintenance?
- How much will it cost?
Efficient Pavement Management System (1/2)

Maintenance cost

Cost (€)

Age (Years)
Efficient Pavement Management System (2/2)
Pavement Life Cycle Analysis

In the case of toll roads, efficient allocation of funding is of paramount importance:
- To organize maintenance/rehabilitation
- Extend pavement lifetime.

With the view to:
- Improving driving safety
- Increasing users’ satisfaction
Pavement Assessment

Main target → Providing safety to users and ride quality

- Total Pavement Assessment
  - Need for proactive maintenance and/or rehabilitation when needed
  - Effective allocation funding coming from tolls, for organizing maintenance/rehabilitation

Long Life Pavements (LLP) → High Quality Pavements
Pavement Monitoring System for Total Assessment

- Visual Inspection
- Structural Assessment
- Functional Assessment

Total Pavement Assessment
Centerline: 70 Kms
Length: 140 Kms (bidirectional)
39 Toll Stations/ 195 Toll Gates (95 ETC capable)
12.5 km of tunnels and cut & cover sections (9% of length)
Daily Entries 2016: 210,492 veh/day
Pavement Conditions Monitoring in Attica Tollway

Operator and Concessionaire team up with National Technical University

Data Collection

Database Development

Analysis

Assessment

Pavement Preservation
Attica Tollway: The Facts

- 25 years concession for finance, design, build, operate and maintain a greenfield toll motorway
- 1st Section opened 03/2001, all Sections 06/2004
- Offer assumed resurfacing every seven years
- Life cycle cost for pavements was introduced during the design and construction phase
- Innovative design extended intervention time to more than 10 years.
- Continuous semiannual monitoring, so that timing, nature and extend of intervention is determined early.
Pavement Preservation:

- Improves the overall condition of the pavement network
- Extends pavement life
- Reduces user delays
- Improves road safety
- SAVES MONEY

What’s new?
Many issues to be discussed...
Thank you!

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