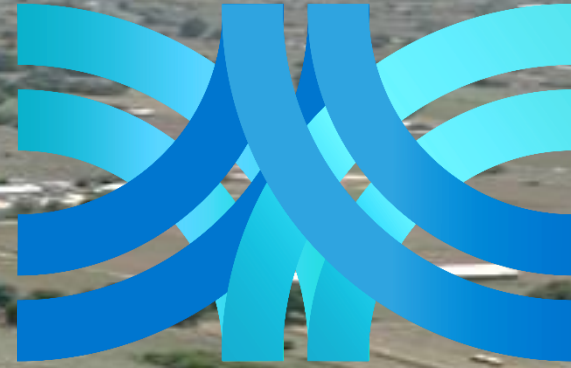


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Macroscopic Accident Analysis at “Korinthos-Patra”

Ioannis Handanos - Civil-Transportation Engineer, M.Sc. - Quality & Administrative Support Manager

Costa Navarino, Messinia, Greece

29-31 May 2019

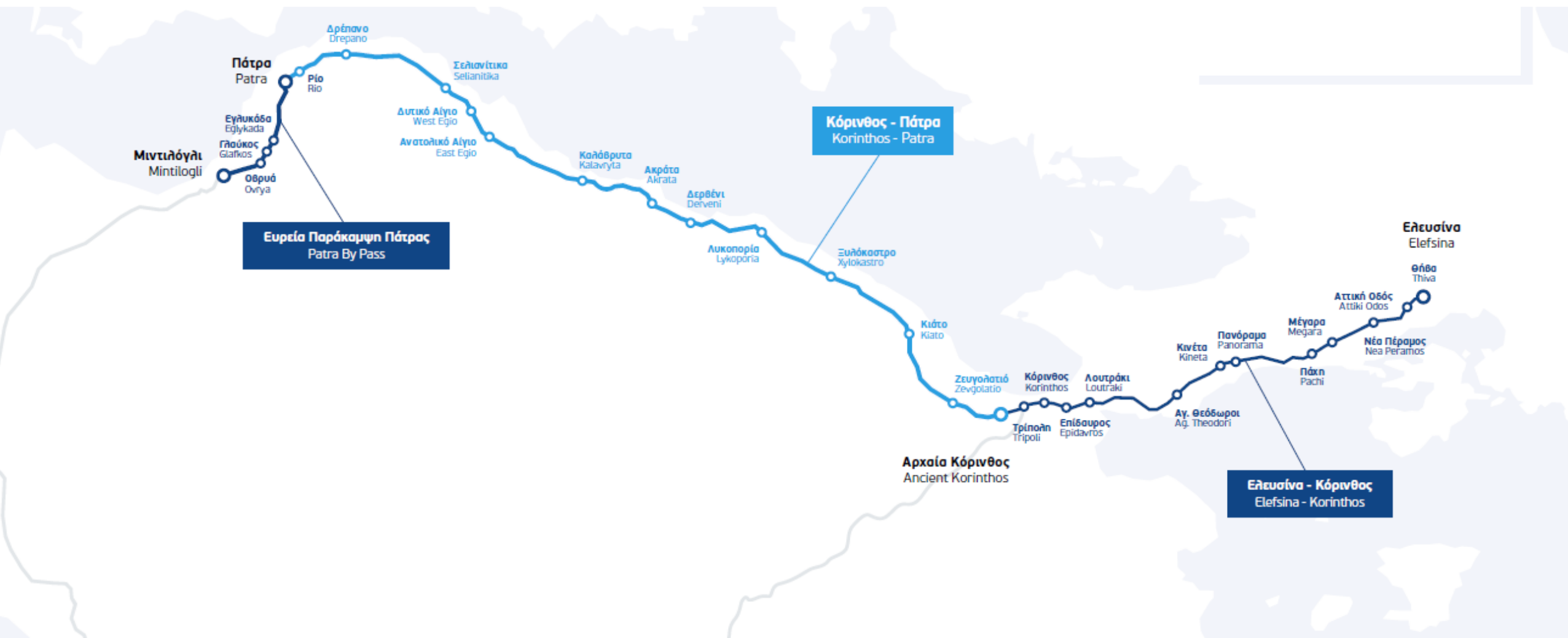
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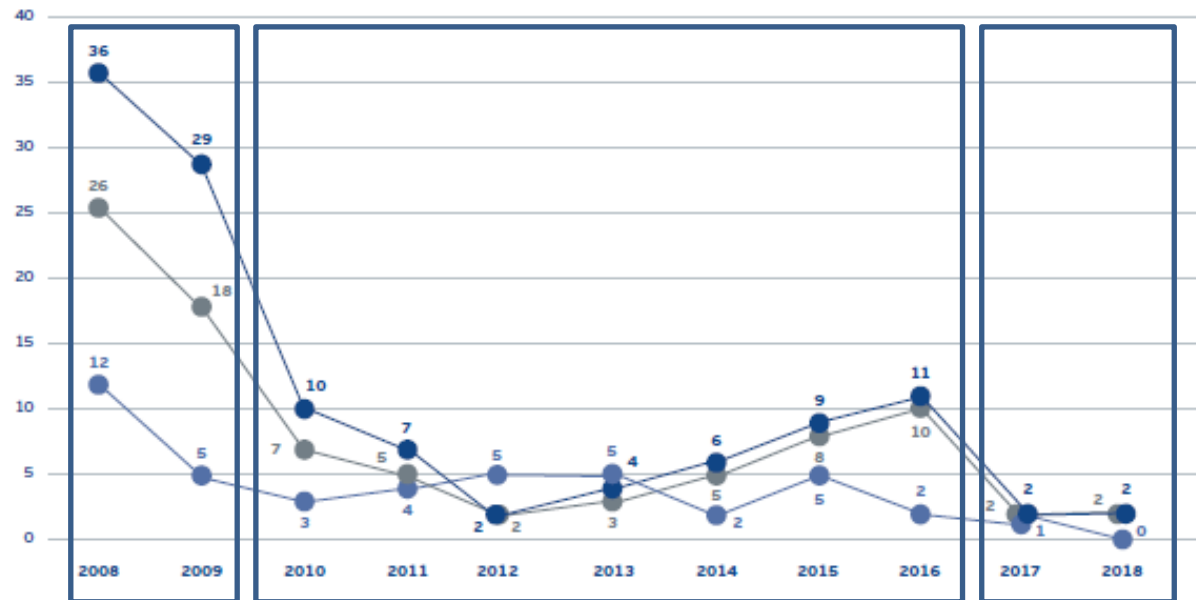
“Korinthos-Patra” Section “Before & After”





Accidents Evolution vs. Project Milestones

Τμήμα Κόρινθος-Πάτρα
Korinthos - Patra Section



● Θανατηφόρα Ατυχήματα / Fatal Accidents ● Θύματα / Fatalities
● Ατυχήματα με Βαρύ Τραυματισμό / Accidents with heavy injuries

Κόρινθος - Πάτρα (θύματα ανά 10⁸ διαυθθέντα οχηματοκιλόμετρα)
Korinthos - Patra (fatalities per 10⁸ vehicle-kilometers travelled)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Δείκτης Θανάτων/οχημ/κμ / Fatality Index	3,86	3,08	1,22	1,03	0,35	0,74	1,13	1,68	2,00	0,32	0,30

2008 - 2009 Development of Safety Improvement Measures

- 2008 Concession Commencement
- 2009 First safety measures

2010 - 2016 Full Development of Traffic arrangement

- 2011 Works suspension
- 2014 Reconstruction - Project Restarted
- 2015 Capital Controls
- 2016 Delivery of first motorway sections

2017 - 2018 Completion of Motorway

- 2017 Operation Completion
- 2018 Full Completion

2008 – 2009

Initial Safety Improvement Measures

□ Initial road safety measures in the first 12 months implemented by the Construction JV

- ✓ 74 km of existing safety barriers replaced/improved
- ✓ Improvement of ant-skid pavement capacity at a length of 66 km and 50,000 m2 of local pavement repairs
- ✓ 240 km of road marking
- ✓ improvement of visibility and increase of the width of the road by green maintenance alongside 176km of the road
- ✓ 1000 pcs of damaged signs cleaned and replaced
- ✓ 17,700 pcs of safety barriers reflectors were cleaning and or replaced
- ✓ 38 km of road lighting repairs
- ✓ 242 km cleaning of the shoulders and bases of plants, soil and waste and opening of the water catchment kennels.
- ✓ 25 km "cats eyes installed
- ✓ Arrangement of existing parking spaces with marking, barriers and signing

□ Results

- ✓ 19% reduction of fatalities
- ✓ 91% of fatalities due to head-on collisions

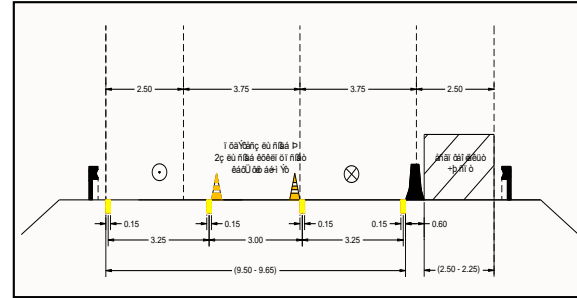


2010 – 2016

Development of Traffic arrangements

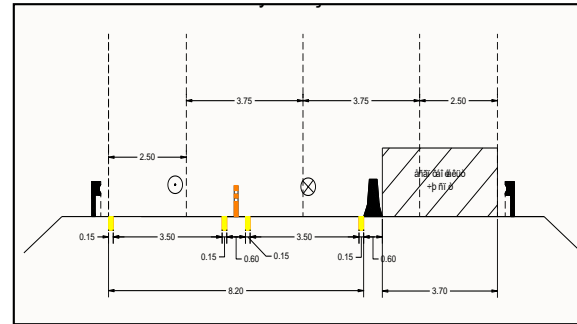
□ 2+1/1+2 type

- ✓ implemented in areas with higher traffic
- ✓ where the alternative route is of limited capacity and the required width is available
- ✓ Arranges the traffic in 3 lanes ($3,25+2.80+3,25=9,30$ m)



□ 1+1 type (with lay-bys)

- ✓ available width for traffic doesn't allow for 1+2 type
- ✓ one lane per direction is provided
- ✓ with a light mean of visual separation (bollards) in between



□ presence of traffic arrangements, imposing restrictions on reckless driving (speed, overtaking)

- ✓ 86% reduction of head on collisions
- ✓ further 79% reduction of fatalities

2017 - 2018

Completion of Motorway

❑ New Motorway Characteristics

- ✓ 13 interchanges
- ✓ 22 over passes, 140 under passes and 47 bridges
- ✓ 9 tunnels (12 branches) of 16 km total length
- ✓ 165 culverts
- ✓ 5 MSS

❑ ITS equipment

- ✓ ERT's
- ✓ Cameras
- ✓ Variable Message Signs
- ✓ Traffic Detector Loops
- ✓ 6 Meteo Stations

❑ 2 fatal accident per year

- ✓ >90% reduction comparing to the period before the Concession
- ✓ Majority of accidents with casualties are run-off the road accidents



❑ Integrated Operation Services

- ✓ Traffic & Incidents management & safety of users
- ✓ Continuous Inspection & Routine maintenance of infrastructure and equipment
- ✓ Specific O&M Requirements and Certified O&M Manuals
- ✓ Modern Systems & Equipment
- ✓ Agreements with Police & Fire Brigade & Use of common Actions Plans
- ✓ Drills for Winter Maintenance and Tunnel Safety

❑ Systematic Monitoring of KPI's

- ✓ ~20.000 incidents per year
- ✓ 13 min. response time
- ✓ 5.500 EEM& IT and 2.500 Civil Works Repairs per year
- ✓ 25.000 incoming calls at 4-digit "1025"

❑ Significant contribution of both:

- ✓ Systems
- ✓ Personnel



Conclusions

- ❑ Road Safety Level improvement is possible even before heavy construction works
 - ✓ Significant effect of the “Low Cost Measures” implemented during the first period
 - ✓ Well prepared traffic arrangements ensure better management of traffic and provide safer environment
- ❑ The presence of a mechanism providing operation services contributes to the improvement of road safety
 - ✓ Positive and effective contribution of the Patrol services in improving safety and reducing congestion
 - ✓ Faster detection of problems / incidents and quick response time
 - ✓ Direct resolution of a large number of “routine” incidents before evolving and turning into major incidents
 - ✓ Patrol Services save resources and free up the emergency agencies to concentrate on their duties
 - ✓ Reduction of accidents and prevention of secondary accidents
- ❑ Fatal accidents and fatalities have been reduced by more than 90%



Thank you for your attention!!

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