egnatia odos observatory

MONITORING THE SPATIAL IMPACTS OF THE EGNATIA MOTORWAY 2015

http://observatory.egnatia.gr

MINISTRY OF INFRASTRUCTURE, TRANSPORT AND NETWORKS

EGNATIA ODOS A.E.

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A tool at the service of spatial development

The Egnatia Motorway Observatory monitors and informs about the spatial impacts of the Egnatia Motorway, as well as of the Egnatia Motorway-Vertical Axes system as a whole, on socio-economic growth and territorial cohesion, on spatial structure, on polycentricity and networking of settlements, on mobility and transport systems, and on the environment.

The Egnatia Motorway is one of the largest road projects constructed in the last years in Europe, and it has been integrated into the priority projects of Trans-European Transport Networks (TENs-T). The 670 km long motorway crosses Northern Greece, connects most of its major urban centres, links 4 major harbours and 6 airports. Over 25 Industrial Areas, Industrial Parks, Small Industry Parks and, in general, developmental zones are located within a radius of 5km on either side of the Egnatia Motorway and each of its vertical axes. The motorway also directly or indirectly connects an abundance of tourist and cultural sites.

Consequently, the Egnatia Motorway:

- has direct or indirect impact on the development and territorial spatial planning in Northern Greece,
- affects the accessibility of local and regional markets and services, the networking of cities and settlements, and the protection and enhancement of the natural and cultural environment,
- reorganises international interconnections and accesses of Greece within the wider area of Central and South-Eastern Europe, and via its Vertical Axes becomes a collector route for the Trans-European Transport Networks and transport corridors.

Within this framework, "EGNATIA ODOS AE" established and has been operating the Egnatia Motorway Observatory acknowledging that the importance of the project and the size of the investment demand the promotion of supplementary actions that will multiply the benefits and prevent the negative impact of the project operation.

Based on documented scientific methods and an infrastructure of modern information systems, the Egnatia Motorway Observatory gathers, processes, and provides valid and updated data on indicators that concern:

- the mobility and accessibility of regions, urban centres, markets and services,
- the level of development and the territorial cohesion according to socio-economic shifts,
- the building development, the land uses and the networking of urban centres,
- the properties of the transport system and the operation of the road network, and
- the quality of the environment.

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The Observatory is a strategic tool providing information and support services to regional development and spatial planning policies and programmes. The results, the reports and the material produced by the Observatory, in general, are available to citizens and interested agencies and institutions via the Internet, but also via print material, booklets, special events, etc.

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Organization-infrastructure-production

The Egnatia Motorway Observatory is the only observatory of transport and spatial impacts in Greece having a permanent organisational structure and operation. Except for the usual statistical reports, it aims at providing valid and updated information and documentation on critical magnitudes and phenomena. By incorporating the Observatory in the structure of EGNATIA ODOS A.E., the maximum possible compatibility and complementarity with the rest of the company activities is achieved, at the minimum possible cost, since the existing human resources and equipment are utilized in a more rational and effective manner.

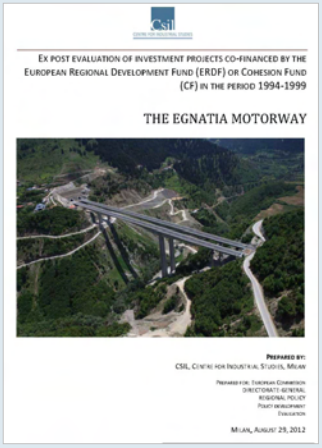
A pivotal activity of the Observatory is the development of specialised know-how aiming at the organisation and operation of an Information System for Spatial Data Management and Indicator Monitoring that enables the recording, calculation and monitoring of various features-indicators, as well as their geographic analysis.

The Observatory Information System includes the operation of an Internet website (http://observatory.egnatia.gr) through which Observatory products are presented and diffused in digital format. Furthermore, an electronic geospatial data and metadata library has been developed, in accordance with Directive 2007/2/EC INSPIRE and Law 3882/2010.

«The accumulated expertise, experience and network of relationships and partnerships developed by the Observatory, create a very important system to record and process data and to monitor the effects of road network in Northern Greece. In this context, the future of the Observatory as a valid mechanism may be associated with the gradual expansion of the scope of its activities to the entire network of roads in the country and the wider region of SE Europe, linking decision making for the transport infrastructure to priorities of spatial development».

Conclusion of the EVALUATION AND PERSPECTIVES OF THE EGNATIA MOTORWAY OBSERVATORY (Ref. Assoc. 5212) - completed in February 2014. http://observatory.egnatia.gr/06_extras/6_4_reports.htm

"From the endogenous dynamic perspective, the project was innovative. With the creation of the Egnatia Odos and its Observatory, it brought about a new organisational scheme for the management of public infrastructure projects in Greece and, moreover, developed new knowledge and expertise for the construction of road infrastructures, while minimising their impacts on the landscape. The impacts on institutional quality could have been much higher, if the innovations introduced by the project had been applied in a consistent manner. In particular, an ad hoc private law company, such as the Egnatia Odos, could have been established also for the upgrading of PATHE motorway, which was started in the same period and is still underway." (Page 3)


Ex post evaluation of investment projects co-financed by the European Regional Development Fund (ERDF) or Cohesion Fund (CF) in the period 1994-1999

THE EGNATIA MOTORWAY

Prepared by:
CSIL, Centre for Industrial Studies, Milan

Prepared for: European Commission
Directorate-General
Regional Policy
Policy Development
Evaluation

Milan, August 29, 2012

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https://intranet.egnatia.gr

http://observatory.egnatia.gr

http://www.egnatia.eu

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The system of indicators

The Observatory was examined by the research institute NordRegio as a case study for the implementation of the ESDP (European Spatial Planning Perspective) in the context of the ESPON programme (European Spatial Planning Observatory Network - project 2.3.1: Application and effects of the ESDP in Member States, 2007, URL: http://www.espon.eu/main/Menu_Projects/Menu_ESPON2006Projects/Menu_PolicyImpactProjects/esdpimpact.html)

The Observatory bases the recording, monitoring and study of the Egnatia Motorway's spatial impacts over time on a system of indicators, by applying scientifically documented specifications, methods, and analysis tools used in current European practice. The system of indicators is developed towards full compliance with the attempts made for the assessment of the Trans-European Networks impacts on the development and cohesion of the European Area. The indicators are compatible with and comparable to indicators used by main EU programs involved in the study of the spatial impacts of transport infrastructures (i.e. DGREGIO, ESPON, ETISplus, etc).

The system of indicators is dynamic –it undergoes a constant review and is being adapted to new conditions, requirements and scientific developments. It comprises 50 indicators, which use specific and calculable magnitudes to provide information on the status of developmental, spatial, demographic, environmental and transport characteristics of the areas affected by the Egnatia Motorway and its vertical axes. For operational purposes and in correspondence with the categories of the spatial impacts of a road axis, the indicators are classified into three large groups: (a) socio-economic & spatial planning (b) environmental, and (c) transportation indicators.

For each indicator the following are drafted:

(a) A Technical Bulletin providing the scientific and technical–methodological specifications for calculating and monitoring the indicator.

(b) A Calculation Manual describing each step of the calculation and monitoring method.

(c) A Results Factsheet presenting the processed results and the development of each indicator over time and in different geographic areas.

The combined assessment and evaluation of indicator results is carried out around a series of basic parameters related to the main objectives of EU policy. Such parameters focus on:

– mobility - accessibility,
– cohesion - development,
– balance - networking, and
– environment – climate change.

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SOCIO-ECONOMIC AND & SPATIAL PLANNING INDICATORS	
SET01	Benefited population
SET02	Market Size
SET03	Work Force
SET04	Growth and prosperity level (GDP per head)
SET05	Unemployment rate
SET06	Accessibility of transport modes
SET07	Accessibility of industrial areas
SET08	Accessibility of sites of cultural & tourist interest
SET09	Population change
SET10	Urban population changes
SET11	Hierarchy of urban centres
SET12	Population density
SET13	Composition of production by industry sector (GVA)
SET14	Composition of employment by industry sector
SET15	Foreign trade
SET16	Urban landuse changes
SET17	Industrial and commercial landuse changes
SET18	Real estate changes
SET19	Business location
SET20	Enterprise development

ENVIRONMENTAL INDICATORS	
ENV01	Population exposed to traffic noise
ENV02	Air pollution
ENV03	Cohesion - fragmentation of settlements
ENV04	Tunnel air quality
ENV05	Landscape restoration
ENV06	Fragmentation of natural areas
ENV07	Land use changes
ENV08	Proximity to protected areas
ENV09	Crossings with surface waters

TRANSPORTATION INDICATORS	
TRA01	Traffic volume (AADT)
TRA02	Traffic composition
TRA03	Person Movements
TRA04	Travel-time
TRA05	Time-distance
TRA06	Freight (transport of goods)
TRA07	Annual Vehicle kilometres
TRA08	Road safety
TRA09	Level of service
TRA10	Road network density
TRA11	Traffic Volume on National Road
TRA12	Trans-border movements
TRA13	Intermodal transport
TRA14	Characteristics of Vehicle Movements
TRA15	Passenger Journeys by alternative transport modes

SPECIAL SUBJECTS AND TECHNICAL INDICATORS (INDICATIVE)
Polycentric spatial development
Territorial cohesion
Transport infrastructure and spatial planning
Spatial perception of mobility (results of O-D research)
Functional Urban Areas (commuting)
Possession of vehicles
Construction - building
Evaluation and result indicators for co-funded projects
Carbonate fingerprint and climate change

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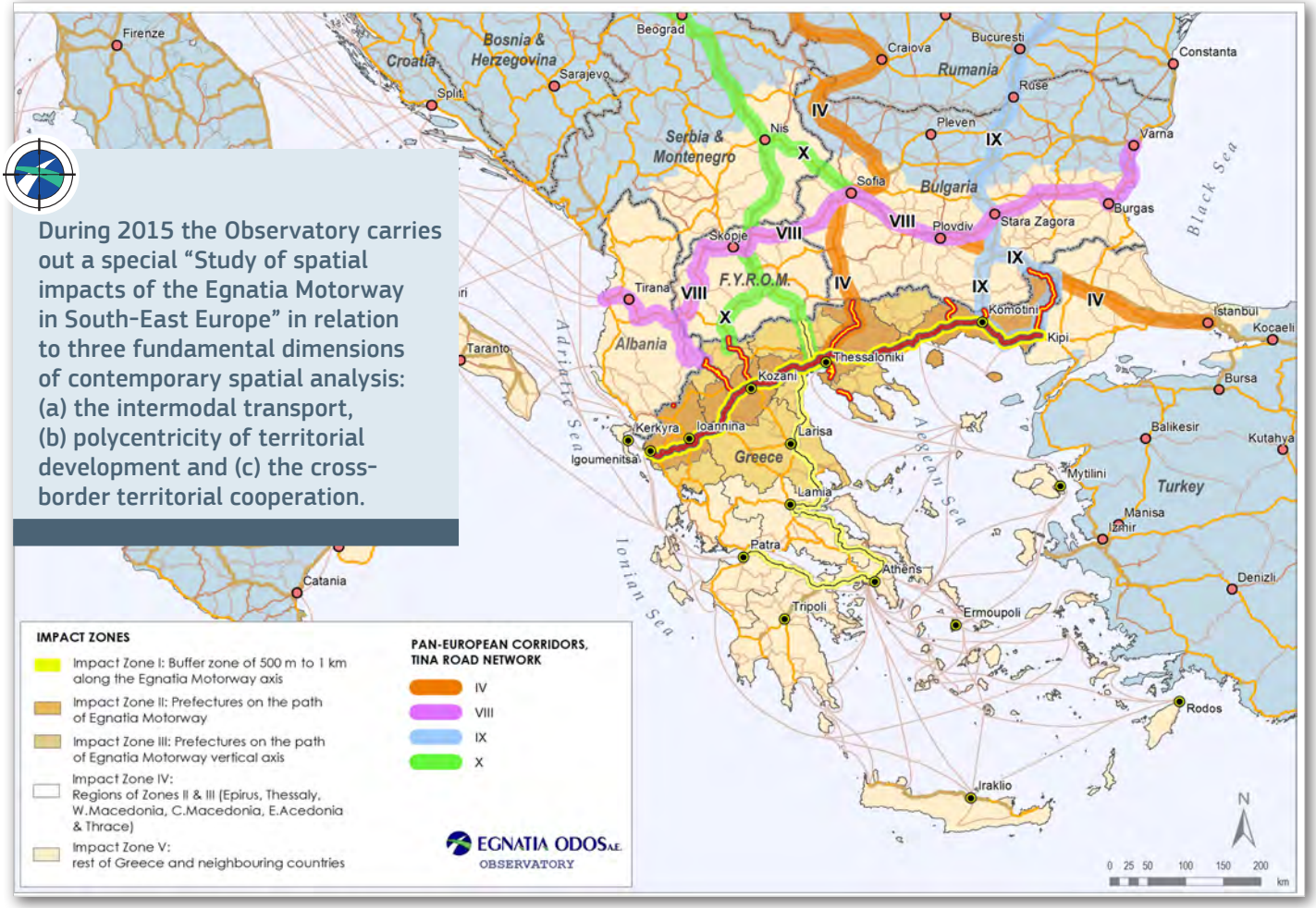
Impact zones

Taking a macroscopic perspective of the basic impact of the Egnatia Motorway and keeping in mind the fact that the developmental and spatial planning projections are made on the basis of programmes on a Regional level, the key area on which the research on the development of the indicator measurements monitored by the Observatory focuses is Zone IV, namely, the Zone comprising the five Regions crossed by the Egnatia Motorway and its vertical axes: Eastern Macedonia & Thrace, Central Macedonia, Western Macedonia, Epirus and Thessaly.

Map of impact zones



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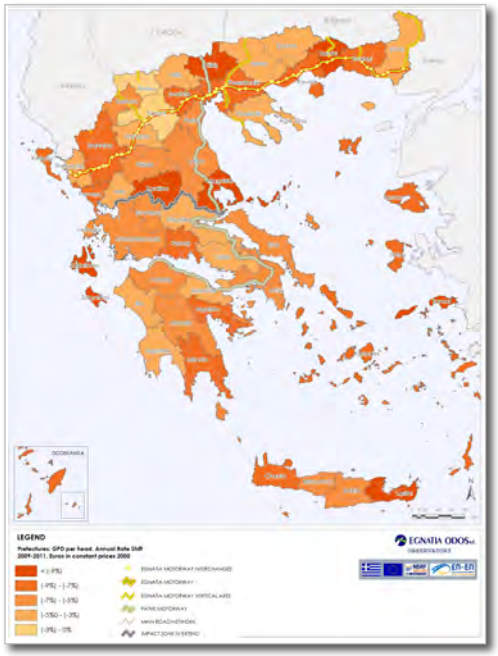
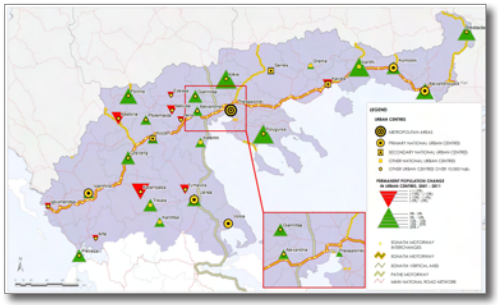
Map of annual rate shift. GPD per head



Map of permanent population change in urban centres



Zone IV, which includes the five Regions crossed by the Egnatia Motorway (Eastern Macedonia & Thrace, Central Macedonia, Western Macedonia, Epirus and Thessaly) represents:

50% of the national territory

36% of the national population (2011)

27% of the national Gross Domestic Product (GDP) (2011)

27% of national exports (2011)

34% of the national employment (2011)

37% of the total national employment in industry – craft enterprises anmd

30% of the construction sector

In Zone IV there are 9 airports, 5 ports, 48 developmental infrastructures sites, out of which 34 are statutory receptors.

In the years 2001-2011, the total population in the Zone of the five Regions was decreased by 0.29%, a decrease percentage that is lower than the one for the whole of Greece (-1.09%). The population in the majority of the Prefectures shows a negative trend, while the largest urban centres, except for Kavala and Veria, show an increase in their population. In the last twenty yeas (1991-2011), the urban population in the Zone has increased by 16.8% (by 11.6% in 1991-2001 and by 4.7% in 2001-2011).

Tourism

For the period 2007-2012, the 5 Regions of Zone IV represent 25.5% of the arrivals regarding all kinds of tourist accommodation establishments, in the whole country. With regard to overnight stays at tourist accommodation establishments in this period, Zone IV represents the 19% of overnight stays in the country, while the fullness of hotels was in average 35%. As far as the tourist accommodation establishments are concerned, throughout the period, the number for such establishments in Zone IV was imcreased by 5.5% while for the whole country has increased by 4.5%.

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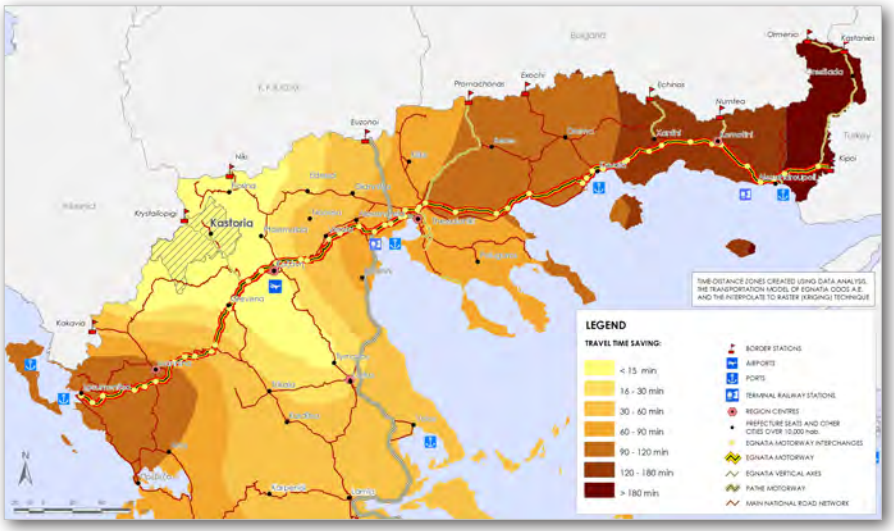
The Egnatia Motorway facilitates combined transport growth, as well as growth of manufacturing, commercial and tourist activities in its impact zone. It considerably decreases the time-distance between cities, terminal stations and transit centres.

Map of travel time saving



Map of annual average traffic volume 2014

The main traffic data source for the Observatory and a valuable collaborator in issues pertaining to the traffic indicators is the Traffic Department of EGNATIA ODOS A.E. (Division of Operation, Exploitation and Maintenance). The Traffic Department has developed an integrated system for the collection and processing of traffic counts, as well as a traffic forecasting model that provides an abundance of traffic data, forecasts and analyses.

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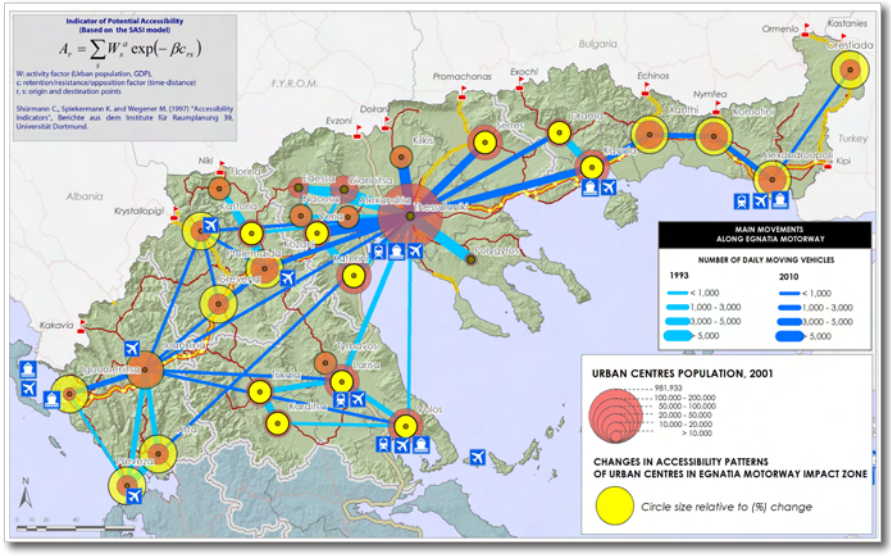
The Egnatia Motorway:

– decisively contributed to improve access to some of the less accessible Regions of Greece and the EU, such as the Regions of Epirus, Western Macedonia and Thrace,
– contributes to reducing regional inequalities in terms of accessibility and enhances a more polycentric model of spatial growth,
– affects regional growth and spatial planning thus radically changing the traffic data that are related to the attraction of investments, the allocation of new activities and regional planning,
– directly affects the access of products and services to local and regional markets, the mobility and the networking of cities and settlements, the land uses and land values, as well as the protection and enhancement of the natural and cultural environment, and
– upgrades the role of harbours, while, through its vertical axes, it functions as a collector route for the Trans-European Transport Networks.

A specific social dimension of the Egnatia Odos motorway's positive effects regards the removal of isolation brought about a significant number of smaller settlements and villages, by significantly improving the ease of travel to and from urban centers and related social and economic services. For example, within 30 minutes the city of Ioannina is now accessible from 137,000 thousand residents, were previously it was accessible from less than 95,000 inhabitants (+70%). Moreover, in two and a half hours by road network, the city of Ioannina is now accessible from more than 2.3 million people, while before the construction of the Egnatia Odos motorway this population did not exceed 381 thousand residents.

Map of potential accessibility



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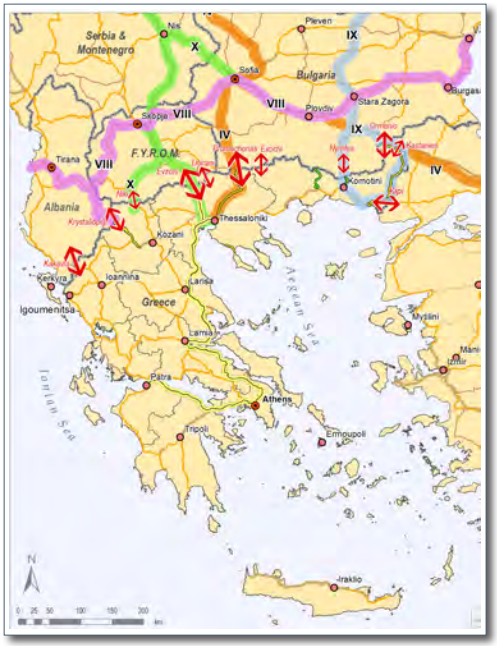
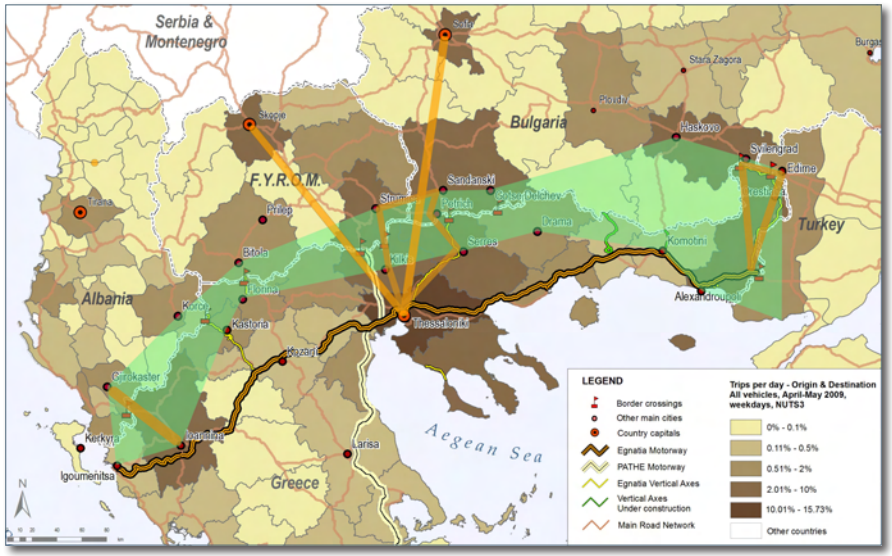
Cross-border trips

An Origin-Destination survey conducted at border stations in the spring and summer of 2009 indicated that:

- commuting was increased by 90% (2005-2009)
- 35% of trips are either daily (commuting) or regular (1-4 times a week)
  - 6% daily trips (commuting)
  - 29% regular trips (1-4 times a week)
- 33% of trips concern regular travelling (1-3 times a month)
- 43% are business trips
- 12,4% concerns commuting
- 30,6% concern business purposes
- 45% of trips are touristic / recreational ones
- 12% of trips serve other purposes (including shopping)
- 45% of vehicles (approximately 10,200 vehicles per day) travel over a distance longer than 50km from border stations.



Map of cross-border trips



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Between the years 1999 and 2009 and in the areas affected by the 17 intersections of the Egnatia Motorway, the following were recorded:

100%
average increase in commercial land uses

76%
average increase in mass transport facilities and transit centres

73%
average increase in touristic and recreational uses

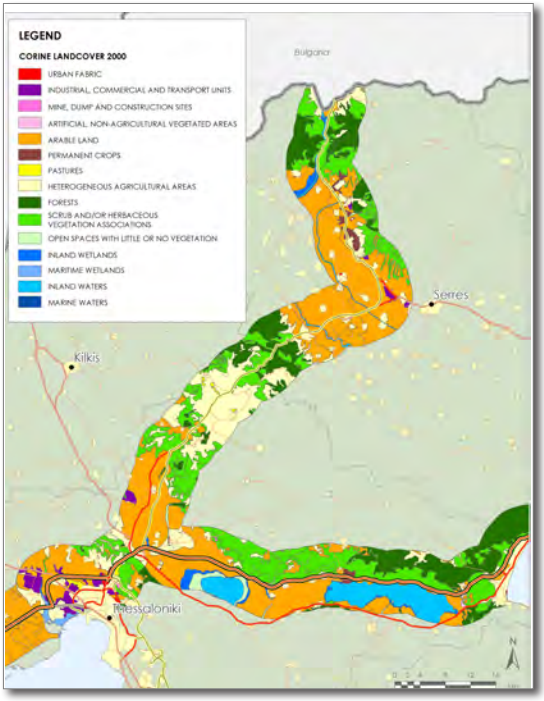
41%
average increase in new businesses.
Furthermore, the following changes took place in the I/C areas of Egnatia motorway and in the same time period:

908
new businesses were formed, out of which:

59,8%
in the tertiary sector

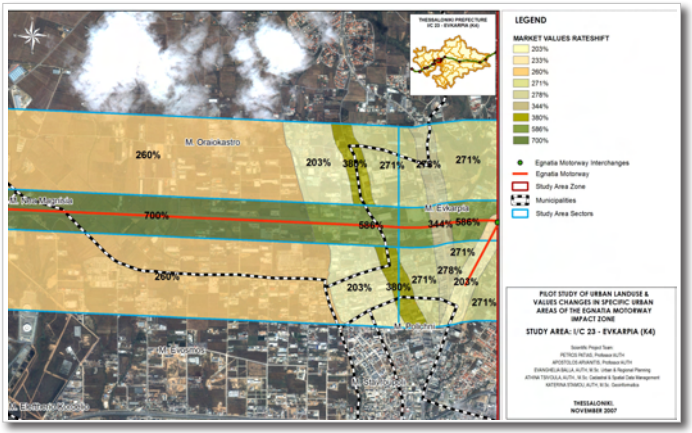
39,9%
in the secondary sector

0,3%
in agriculture.

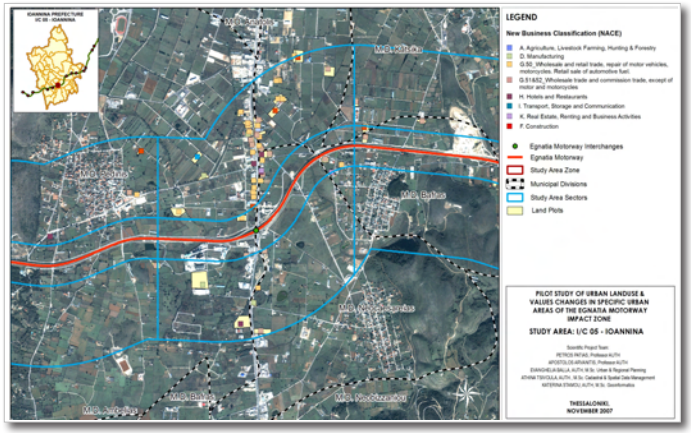


Map of corine landcover

Map of market values rateshift SET18



Map of new business classification SET19



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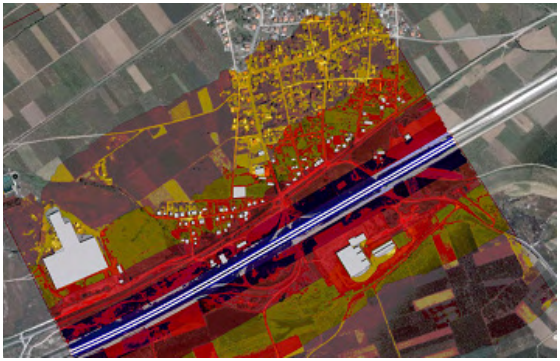
Road traffic noise and pollutant emission levels

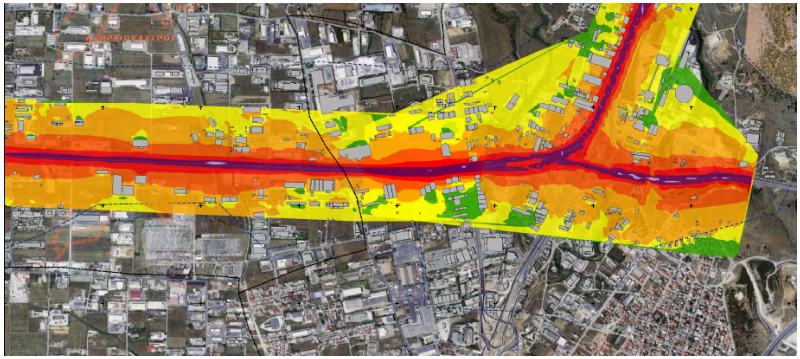
For the full monitoring of road traffic noise and pollutant emission levels, the Observatory collaborates with the EGNATIA ODOS A.E. Environment Unit (Division of Operation, Exploitation and Maintenance) which performs regular noise counts and air pollutants measurements in the built-up areas at both sides of the motorway putting an emphasis on road sections that are seriously affected by road traffic noise, as well as on those crossing sensitive ecosystems. In addition, special studies are conducted regarding the "Measurement and Mapping of Road Traffic Noise in Residential Areas in the vicinity of the Egnatia Motorway", complying with the requirements set in Directive 2002/49/EC.

The construction and opening to traffic of the largest part of the motorway has led to the bypass of many existing settlements and their statutory borders, thus improving the quality of life by reducing the percentage of population exposed to traffic noise.

Traffic noise map 1



Traffic noise map 2



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The setting-up, development and operation of the Observatory in the period 2000-2009 were co-funded by the EU and the OP-RAPUD. The implementation of the programmed actions of the Observatory for the period 2011-2015 (NSRF - National Strategic Reference Framework) is co-funded through the OP-Accessibility Improvement.

COMPLETED STUDIES

- Report on the status of the Egnatia Motorway Impact Zones.
- Pilot study on the urban planning changes in three selected urban areas in the Egnatia Motorway direct impact zone.
- Study on urban planning changes in land uses, in the setting-up of businesses and in land values in the vicinity of 17 Egnatia Motorway intersections.
- Measurement and mapping of road traffic noise.
- Study on transport indicators: freight and combined transport, characteristics of trips at border stations and trips with alternative means
- Study on accessibility indicators for areas of special interest and mass transport in the zone of the regions crossed by the Egnatia Motorway.

INDICATIVE REPORTS AND PUBLICATIONS

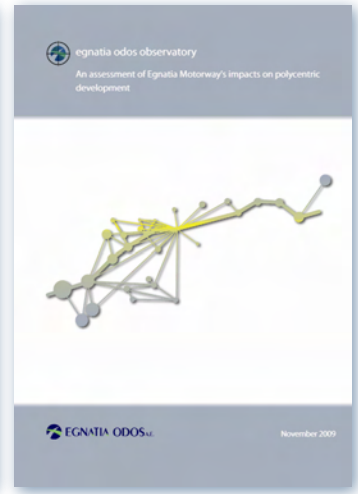
- Cross-border trips in Northern Greece: recording the corresponding spatial interactions.
- Transport policy and territorial cohesion: the case of the Egnatia Motorway in Northern Greece.
- Entrepreneurship in the Egnatia Motorway Impact Zone.
- Determination of Functional Urban Areas based on daily commuting.
- The role of the Egnatia Motorway and its vertical axes in the polycentric growth of their impact zone.
- 1st Report on the Spatial Impacts of the Egnatia Motorway: mobility– cohesion – balance - environment.

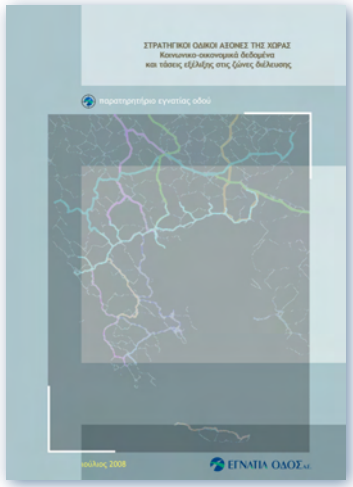
RESEARCH STUDIES PLAN 2011-2015

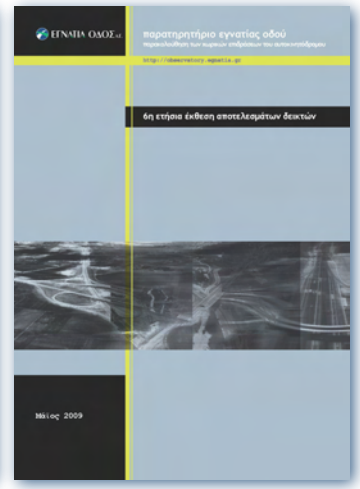
- Study on the assessment and future prospects of the Observatory.
- Study on the Egnatia Motorway impacts on the intermodality of transports, the polycentric spatial growth and the cross-border cooperation in SE Europe.
- Origin – Destination survey study aiming at recording the characteristics of vehicle movements on the Egnatia Motorway and its vertical axes.
- Study on the accessibility indicators for the sites of special interest.
- Research study on freight, combined transport, characteristics of trips at border stations, and trips with alternative means of transportation.
- Study on land use changes, the setting-up of businesses, and land values.
- Study on annual calculations and analyses of the environmental indicator “water quality”.
- Study on annual monitoring and analyses of the environmental indicator “air quality”.
- Study on annual monitoring and mapping-analyses of the environmental indicator “population exposed to traffic noise”.

INDICATIVE PLAN FOR SPATIAL IMPACTS REPORTS, 2011-2015

- Spatial structure and population changes 2001-2011.
- The Egnatia Motorway and the spatial structure of tourist sites.
- 2nd & 3rd Spatial Impacts Report
- Egnatia motorway in spatial planning design and application







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NSRF 2007-2013 NATIONAL STRATEGIC REFERENCE FRAMEWORK (NSRF) 2007-2013
ΕΠ-ΕΠ ΕΠΙΧΕΙΡΗΣΙΑΚΟ ΠΡΟΓΡΑΜΜΑ