

University of Thessaly
Department of Planning and Regional Development
Graduate Program in European Regional Development Studies

Thesis Title:
**EVALUATION OF THE FINANCIAL CONSEQUENCES OF LAND
SLIP IN TEMPI VALLEY**



Supervisor : Polyzos Serafeim

Student: Kalogirou Vassiliki

September 2010

**ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
ΒΙΒΛΙΟΘΗΚΗ & ΚΕΝΤΡΟ ΠΛΗΡΟΦΟΡΗΣΗΣ
ΕΙΔΙΚΗ ΣΥΛΛΟΓΗ «ΓΚΡΙΖΑ ΒΙΒΛΙΟΓΡΑΦΙΑ»**

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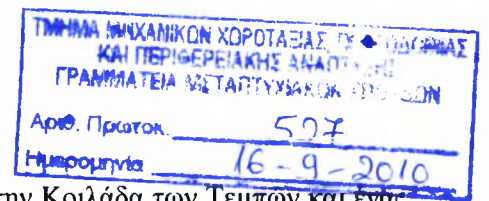
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Στους γονείς μου Κωνσταντίνο και Φωτεινή

Για την αμέριστη συμπαράσταση και βοήθεια που μου παρείχαν

To my parents Konstantinos and Fotini

For their help and assistance during this year



Περίληψη

Στο τέλος του έτους 2009 ένα τρομερό ατύχημα συνέβη στην Κοιλάδα των Τεμπών και ένας Ιταλός Αρχιτέκτονας έχασε τη ζωή του. Αυτό το γεγονός μαζί με την εξάμηνη παράκαμψη-ταλαιπωρία των οχημάτων μέσω Αγιάς, Ελασσόνας και Μουργκάνι αποτέλεσαν το έναυσμα για την παρούσα διπλωματική εργασία.

Το βασικό συμπέρασμα είναι ότι οι περιοχές που επηρεάστηκαν κυρίως από το γεγονός ήταν η Θράκη και η Πελοπόννησος. Η ανάπτυξη στην Ελλάδα γενικά δεν επηρεάστηκε αλλά η ζημιά στον τουρισμό ήταν μεγάλη ιδιαίτερα κατά τη διάρκεια των διακοπών των Χριστουγέννων. Επιπλέον ο νομός της Λάρισας επηρεάστηκε από αυτό το γεγονός σημειακά.

Λέξεις κλειδιά: Κοιλάδα Τεμπών, Πίνακας, Αξιολόγηση, Περιοχή-Νομός, Προέλευση, Προορισμός.

Summary

In the end of the year 2009 a terrible accident happened in Tempi Valley and an Italian architect lost his life. This fact together with the six-month traffic deviation of the vehicles via Agia, Elassona and Mourgani were the starting point for this thesis.

The basic conclusion is that the regions that were most affected from this event were Thrace and Peloponnese. Growth throughout Greece in general was not influenced but the damage on tourism was horrible for the period of Christmas. Moreover the prefecture of Larissa was affected as a point from this fact.

Key words: Tempi Valley, Matrix, Evaluation, Region, Origin, and Destination.

Résumé

A la fin de l'année 2009 un accident terrible est survenu dans la vallée de Tempi et un architecte italien est décédé à la suite de ceci. Cet événement ainsi que la déviation des véhicules pendant six mois via Agia, Elassona et Mourgani ont suscité la présente thèse.

La conclusion primordiale est que les régions qui ont été le plus affectées par cet événement ont été la Thrace et le Péloponnèse. Le développement en Grèce n'a pas été affecté en soi mais le tourisme a subi des pertes importantes surtout pendant la période des vacances de Noël. La circulation vers certains points de la Préfecture de Larissa a été aussi affectée.

Mots - Cles: Vallée de Tempi, tableau, évaluation, région, provenance, prédestination

ΕΥΧΑΡΙΣΤΙΕΣ

Η εργασία αυτή έγινε κατά τη διάρκεια του καλοκαιριού 2010 κατόπιν του ατυχήματος που σημειώθηκε το Δεκέμβριο του 2009 στην Κοιλάδα των Τεμπών. Τούτο είχε σαν επακόλουθο μια απίστευτη εξάμηνη ταλαιπωρία για όλους τους οδηγούς που μετακινούνταν μέσω των παρακάμψεων που παρουσιάζονται αναλυτικά στην παρούσα διπλωματική εργασία.

Για τη διεκπεραίωση της παρούσης εργασίας θα ήθελα να εκφράσω τις ευχαριστίες μου:

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This thesis was done during the summer period of the year 2010 after the accident that happened in December 2009 at Tempi Valley. As a consequence all drivers were really tormented and the vehicles were transported via deviations that are analytically presented in this essay.

I would like to thank:

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ACRONYMS

EOMA Ειδικές Ομάδες Μηχανημάτων Ανασυγκρότησης
ΚΤΕΛ Κοινό Ταμείο Επαγγελματιών Λεωφορείων
MOMA Μεικτές Μονάδες Μηχανημάτων Ανασυγκρότησης
ΟΣΕ Οργανισμός Σιδηροδρόμων Ελλάδος
ΠΑΘΕ Πάτρα-Αθήνα-Θεσσαλονίκη-Εύζωνοι
ΣΔΙΤ Συμπράξεις Δημοσίου Ιδιωτικού Τομέα
ΥΠΕΧΩΔΕ Υπουργείο Χωροταξίας και Δημοσίων Έργων

BEA Bureau of Economic Analysis
CBO Congressional Budget office
EPC Energy Performance Contracting
EU European Union
GDP Gross Domestic Product
GIS Geographical information System
INTERCO-PPP Interregional Cooperation concerning PPP
IRR Internal Rate of Return
MIRR Modified Internal Rate of Return
O&P Operation & Maintenance
PATHE Patra-Athens-Thessaloniki-Evzoni
PPP Public Private Partnerships
SPV Special Purpose Vehicle
SRF Ship Repair Facility
TEN Transport European Networks
UK United Kingdom
VfM Value for Money
VHS Video Home System

Introduction

In the end of the year 2009 a geological phenomenon was observed in Tempi Valley. Rocks fall in the National Road that leads from Athens to Thessalonica (also Known as Π.Α.Θ.Ε. in Greek) and a man lost his life on Wednesday the 16th of December of the year 2009.

The victim, identified as an Italian architect engineer, was killed when boulders smashed into the vehicle he was driving. The deceased was the project director of the bridge being constructed at the site, who had just arrived with other employees of the Malliakos-Klidi consortium to inspect damage caused by falling rocks at the same spot on Wednesday the 16th of December and Thursday the 17th of December of the same year. Another landslide occurred as the 62-year-old engineer and the consortium employees arrived in two cars.

The Tempi Valley is placed in the centre of Greece, in the region of Larissa and the prefecture of Thessaly and one of Greece's best-known and rugged canyons. It is also placed between the two highest mountains of Greece: Olympos and Ossa. It is believed that mountain Olympos was the Residence of the 12 Old Gods of Mythology. This fact together with the church of Santa Paraskevi and the peculiar geography of the Valley has made the region touristically developed. After the accident the Greek government together with the police and the construction firm of the tunnels was obliged to close the road. The vehicles were diverted either by the route Larissa→Agia→Stomio (mainly the cars) or by the route Larissa→Elassona→Katerini (mostly the buses and the trucks). Due to the difficulty of driving in those two routes (many curves and bad condition of the road surface) some drivers even preferred following the route Larissa→Trikala→Grevena due to the fact that driving in Egnatia odos is easier and more convenient for a driver. The latter is an issue for consideration especially for professional drivers (either bus or truck ones) if someone co-estimates the value of fuels.

All the above-mentioned facts changed the economic, social and touristic equilibrium of many Greek regions during the six-month stabilization works at the specific site. Finally transportation in Greece had changed especially concerning the mass media as the trains and the National Railway Organization (Ο.Σ.Ε. in Greek) raised their income and the public interurban buses (broadly known as Κ.Τ.Ε.Α. in Greece) were traveling almost empty.

The aim of this essay is an evaluation of the situation that occurred from the 16th of December of the year 2009 until the 7th of May of the year 2010. More specifically the main question that is attempted to be answered is: “Was the region of Larissa the most affected from the land slip in Tempi Valley?”. The sub questions are: “Which other regions and prefectures were affected from the tragic fact?”, “Which sections of the local economy confronted the main problems?”. Finally the conclusions that will occur concern mistakes that may have been concerned or future policies either for local development or for national development.

The main methodology that will be used is the reevaluation of the existing survey, from the year 1997, of the “Doxiadis” Transport Survey Office (that is addressed in Kifisia-Athens, 13 Aigidon Road) and the Greek Government has financed.

The originality of this essay deals with the short time from the accident (16 of December 2009) until the deposit of the essay meaning only some months, less than a year later. Even more with this essay there will be made a trial to examine in which way an accident in the center of Greece affects freight transportation, trade, tourism and the local society in general.

The utility of this thesis is complex and compound at the same time.

First of all it will be useful for the University of Thessaly as it is a first approach after the accident and the severe coincidences that occurred in Regional Economy.

Secondly it will be useful to the Prefecture of Larissa and the Municipalities that are mostly been affected from the incidence either negatively or positively. For example the Community of Ambelakia (a region that is historically important for Greece and the region) seems to be affected negatively concerning tourism arrivals. and the Municipality of Elassona also. The urban road net of the Municipality of Elassona confronts grant problems with the maintenance of the road surface inside the limits of the city as the heavy trucks caused huge damages. On the other hand Sotiritsa, Agiokampos and Velika, three coast villages were greatly benefited if someone interprets the stops of the vehicles passing through and the raised income in restaurants and fish tavernas. But the road net was not ready to hold out the freight of the trucks and buses that were diverted from that route as it was transformed to a national road.

Thirdly the representatives of drivers of both Public Trucks and Public Buses could use the conclusions that will occur as a mean of pressure towards the Government considering the lack of income that they dealt with the last months during their transportations from a certain region to another one and mainly if they were obliged to divert their usual route.

Finally the Greek government (meaning the Ministry of Environment and Social Works – in Greek ΥΠΕΧΩΔΕ and the Ministry of Economy) could and should consider under thought the conclusions that will occur from the flows of vehicles from prefecture to prefecture inside Greece and their modification after the traffic changes. A Special mention may occur for the Planning of Road Construction as the Road from Agia to Omolio is greatly damaged.

The main problem: traffic diversification

Road travel between northern and southern Greece remained problematic on Saturday the 19th of December, following the landslide at the Tempi Valley that cut off the main north-south axis.

Announcements by the Greek traffic police said that private cars and small trucks up to 3.5 tonnes using the Athens-Thessaloniki national highway heading south would be diverted at the junction near the city of Katerini and led to Agios Dimitrios and from there to the Katerini-Elassonas-Tyrnavos-Ambelonas-Gyrtoni national highway to the old Larisa-Thessaloniki national highway and then onto the Sykourio-Larisa rural road, where they would rejoin the Athens-Thessaloniki national highway at the Sykourio junction.

Larger vehicles and coaches will be directed off the national highway at Kleidi, Imathia toward the Egnatia Highway between Veria and Kozani, from which they would join the Kozani-Elassonas national highway and then follow the same route as cars and smaller goods vehicles.

Vehicles moving north, likewise, will be directed off the national highway at the Sykourio junction and follow the reverse routes toward Thessaloniki.

Transports and Networks Minister Dimitris Reppas stated on Friday 18 of December of 2010 that the Tempi Valley section of the Athens-Thessaloniki national motorway will be closed for at least a month as a result of the major landslide on Thursday the 17th of December that virtually cut Greece in half and killed one person.

The Minister in statements that he made in the city of Larissa, central Greece, stressed that a clearer picture of the situation will be available on Monday the 21st of December 2009, when the extent of the problem will be fully assessed by Greek and foreign experts who will suggest solutions. Minister Reppas referred to the use of alternate routes namely, the Larissa-Elassona-Kozani road, the Larissa-Elassona-Katerini road and the Larissa Prefecture coastal road, all of which had to undergo improvements to cope with the increased traffic due to the holiday season.

This traffic diversification lasted until Friday the 7th of May with the exception for 15 days for Easter holidays (between Friday the 26th of April and Monday the 12th of April) and the weekend that concluded the holiday of the first of May. The exact routes can easily be seen in the map that follows (Map 1). The map was printed by the Ministry of Transport and Networks and was distributed to the Greek drivers in the tolls. It was always available in the Ministry's Internet site.



Map 1 Traffic Deviations

Chapter 1. Presentation of the area

1.1. Historical data

The river Pinios and its tributaries in the Larissa district, the Sarandaporos or Titarisios and the Farsalitikos or Apidanos, which in a blessed watery equilibrium make their life giving across the heart of Thessaly, water the Thessalian plain. The end of the rivers course is the Vale of Tempi, a delightful narrow stone gorge between Ossa and Olympos, whose praises have been sung since the depths of antiquity by poets, conquerors and travelers. And now only their eternal works of art, the mythological references, poems, engravings and paintings, the adjectives and descriptions remain to record the attraction, the aesthetic pleasure and the spiritual fulfillment. The Vale of Tempi was a place where the eternal divinities of fire, beauty and combat were venerated: the ancient gods Apollon and Aphrodite and their Christian successors St George and St Paraskevi, and on practically the same sites, as archeological research has shown. This ancient Greek tradition was continued, during the years of Ottoman rule, by the takes of Hasan Baba at the Western end of the Valley, which housed monks of the Muslim order of Bekhtasi dervishes, whose tradition shares many points of worship and dogma with the Christian faith. Down the sheer rock faces of the gorge grows the laurel, which according to tradition is the arboreal version of Daphne, daughter of Peneus, who was transformed into a bush in order to escape the amorous attentions of Apollon. According to a myth, the god Apollo was in love with Daphne, the daughter of Pinios. In order to prevent Apollo from catching his daughter, Daphne's father turned her into a plant (Daphne means bay in Greek) that is very common in the area. It was in the same vale - according to the myth - where the Greek god Pan used to chase the dryads and the nymphs.

Olympos is universally known from the Greek Mythology, as it was the residence of the 12 Gods of ancient Greece and the residence of the Muses. The 12 Gods lived in the canyons- "Olympus creases" as Homer called them-where there are their palaces, with the Pantheon (today called Mytikas) - was their meeting point. The mountain is sacred of Antiquity and became the cradle of the liberal Greek religion, philosophy and education. It is considered up until today the symbol of modern European culture. Olympos is incorporated into many myths for thousands of years. It

was laurel branches from Tempi, carried in sacred procession to Olympia that crowned the victors at the ancient Olympic games.

There is a reference of Kissavos in the Greek Mythology when the two mighty giants Otos and Ephialtes sons of Loeus, wishing to claim Zeus' power, placed Pelion on Kissavos so as to reach and conquer Olympus. In antiquity it was Magnites that inhabited this mountain, whereas it is associated with the veneration of the goddess Demeter (Dimitra in Greek), and also with Asclepius, Hercules, Philoctetes, Alexander the Great etc. Today a great part of Kissavos has been declared as "Ossa Aesthetic Forest" and classified as a special protection area by the Pan- European network Natura 2000, as it is an area of exceptional natural beauty.

1.2. Geographical data

Tempi valley is situated in the area between the mountains Olympos and Kissavos (Ossa), and is run by the river Pinios. The river flows through the mountains and the vale, to finally flow into the Aegean Sea. Some historians have argued that in the distant past Thessaly was an enormously big lake, which literally split in two after a huge earthquake and emptied its waters in two the sea. The result was the formation of two mountains instead of the one that was previously there, with the valley of Tempi in between.

Olympus lines between the two prefectures of Greece, Thessaly and Macedonia, and more specifically between Pieria and Larissa, and its highest peak, Mitikas rises to 2,917 meters high. Over 1,600 meters it is an alpine zone. Its slopes are steep and covered by evergreen bushes and forests of conifer and deciduous trees. Through the deep mountain gorges two small rivers flow precipitately: Enipeas and Tilianas flow into the Golf of Thermaikos. Olympus is the highest mountain range in Greece. Olympus has an enchanting natural environment as it stands out for its rich flora and fauna and is the first area in which a special protection regime was established 50 years ago, as it was declared a National Forest in 1938. Many welcoming villages lie on the slopes of the mountain whereas the whole area is a favorable destination for nature-lovers and visitors who wish to relax. Olympos is 20 km away from Ellassona (a market town belonging to Larissa's prefecture) and 18 km away from Litohoro (a market town belonging to Pierre's prefecture). The limits of the mountain spread in a circle around its roots, with a perimeter of 150 km and an

average diameter of 26 km whereas the overall area covered is 600 square km. The mountain has numerous deep ravines and a lot of regularly shaped peaks (many of which are more than 2,000 meters high). The highest and most impressive peaks are steep though. Apart from Mitikas other impressive peaks are Skolio and Stefani, which are 2,911 and 2,909 meters high respectively. These peaks rise almost vertically, thus forming an arrow called “Megala Kazania” (the Big Cauldrons), the biggest precipitous funnel-shaped hollow of Olympos, being 1,000 meters wide and 600-700 meters deep.

Kissavos, also known as Ossa, lies on the east side of Thessaly south of Tempi Valley, facing mount Olympus. The two mountains are divided by Tempi vale. The forests in Kissavos and the landscape are magnificent. Precipitous brooks create many waterfalls and ponds within large rocks, plants trees and dense vegetation including beeches, fir trees and chestnut trees. Waterfalls, rivers and ponds are very alluring. A large part of Kissavos has become the “Aesthetic Forest of Ossa” and is protected by the European Network NATURA 2000. Its east side is all green and joins the Aegean Sea creating many small beaches with clean waters. Between the two mountains Olympos and Kissavos and in parallel with the river Pinios (traveling through the Tempi Valley) is the most significant National Road of Greece also known as Ethniki Odos in Greek.

1.3. Geological data

Above the eastern side of the Thessalian Plain gently rises the shapely, conical massif of Mount Kissavos, Ossa. One with Pelion, Olympos, Vermion and Vitsi, it was born at the same hour and of the same spasm of the earth. Geologists tell us that this, and the entire “Pelagonian Arc”, was formed in the Eocene period, some 70-80 million years ago. Then, much later, came the waters, slowly spilling out of the vast Thessalian Lake and with unsuspected force carving themselves a channel to the Aegean, cutting Kissavos off from the other mountains as they created the much-sung, god-inhabited Vale of Tempi and leaving it, as the past says, to pine with envy for Olympos.

Its rocks and its moist Mediterranean climate, with abundant rain and snowfall (estimated at 1100-1200 mm/year) and temperatures ranging between +25 and -10°C, have made Kissavos a habitat filled with all kinds of life.

Forests-dense, vigorous and bursting with health-of strawberry trees, chestnuts, oak, beech and fir cover 15,000 hectares of its eastern flank. And they provide the people who live there with timber and firewood, and those who venture to explore them with passages along its handful of shady watercourses, full of sent and color and the unceasing play of light and shadow, and through bright glades with ineffably restful views, passages immediately accessible from any location via the network of trails created methodically and systematically by the Forestry Service. Purling streams of cold, limpid water and innumerable scattered springs have for thousands of year's refreshed gods, nymphs and dryads, woodcutters, hunters and climbers. These gifts very early brought Man to live among its foothills and lower reaches. Higher up, says Homer, in its gorges and on its summits, lived centaurs. And today the same land, in places like Ambelakia, Spilia and Stomio sustains a world of 15-18,000 people. For climbers Ossa with its soft and gentle slopes is a great experience and delight.

1.4. Important facts concerning the area

The Tempi Valley has always been an issue for great interest for Greece. Either for the beautiful geomorphology, or for the church of Santa Paraskevi (Agia Paraskevi in Greek) and together the financial profits and scandals, either for the long traffic queues that are observed there (mostly on Summer time). Even more on the 13th of April of the year 2003 a tragic accident happened and 21 children from Makryhori (a large village of the region of Imathia) and two other elder people that were following the bus lost their lives. The accident involved one bus that carried the students from Athens to their village after a school trip, one car (the one that was mounted by a couple) and a truck carrying wooden blocks. After this accident the need for faster and mainly safer passing of the Tempi Valley grew intensely. This led to a tunnel construction in Mount Ossa and unfortunately during the working process the accident involving the Italian architect engineer happened.

Chapter 2. Construction of roads and railways in Greece

2.1. Description of the Greek interregional highways

The Greek highways that have been constructed or will be carried out are:

- The “PATHE” (Patra-Athens-Thessaloniki-Evzoni)
- The “Egnatia” highway
- The highway of West Greece (“Ionia” highway)
- The “Korinthos-Kalamata highway
- The highway of West Thessaly (E65)
- The “Kristalopigi-Ieropigi” highway
- The “Thessaloniki-Serres-Promahona” highway

These highways will be the basic infrastructures of transportation in Greece for the next years. The problem that this essay is studying is in Tempi Valley and concerns the first highway (The “PATHE” -Patra-Athens-Thessaloniki-Evzoni).

2.2. Public Construction (The case of MOMA)

MOMA, which in Greek means Mixed Groups of Reconstruction Machines, was a military service that was founded approximately in the year 1956 from the Greek government in order to be occupied with the rehabilitation of the Greek open air and of Greece in general. Before MOMA (Μεικτές Ομάδες Μηχανημάτων Ανασυγκρότησης) there was another Military Service called EOMA (Ειδικές Δυνάμεις Μονάδων Ανασυγκρότησης), which translated from the Greek language means Special Groups of Reconstruction Machines. MOMA was the military technical service that was occupied with the opening of the first road in Tempi Valley, that lead from Larissa to Katerini, in between the years 1958-1961. MOMA was disbanded in the year 1990 and the employees were transmitted to other Technical branches of the Greek Government such as those of the Prefectures or the municipalities creating a large hole in the rehabilitation of Greece and especially the Greek open air.

From that year (1990), begins a new chapter for the Greek Infrastructure and work ship in general.

2.3. PPP (Σ.Δ.Ι.Τ.)

2.3.1. Introduction

Public Private Partnerships (PPPs) are contractual agreements, usually long-term ones, between a public entity (the Contracting Authority) and a private counterpart, with the objective of implementing a project and / or providing a service. In a PPP scheme, the private partner bears, in whole or in part, the implementation cost of the project, as well as a substantial part of the risks related with its construction and operation. The public partner, on the other hand, lays out a set of output specifications on the design, technical, and operational characteristics the project and determines the private partner's payment mechanism, either through partial (e.g. annual) payments linked with the availability of the project and the compliance with its output specifications or through direct payments by the end-users via fees (e.g. tolls).

The objective of PPPs is to involve private partners in the implementation of projects or the provision of services, aiming not only at securing additional financial resources, but also at benefiting from their know-how, human resources, innovative approach and ability to efficiently manage complex projects for the public benefit. The main benefits of PPPs are the following:

Ability to finance more projects

The Government, along with the local authorities, have to respond to the constantly increasing needs and requirements of the citizens for modern and qualitative provision of infrastructure and services. The use of private funds, complementary to the public ones, may contribute to the faster implementation of projects and the delivery of services. PPP schemes are a new means of achieving the strategic priorities of public entities, complementary not only to the traditional public works, which by no means will be limited, but also to other forms of partnership between the public and the private sector, such as the concession agreements of the Ministry of the Environment and Public Works or the collaborations of Local Authorities with private partners, that continue to be implemented.

Under PPP schemes, public entities implement and offer to citizens more works and services in a faster and more efficient manner.

The integration, depending on the structure chosen, of the design, financing, construction, and operation of a project under a PPP structure, along with the transfer of relevant risks to the private partner, creates incentives for a more diligent and efficient design and implementation of the projects. This, in effect, results in substantial reductions, if not abolishment, of cost and time overruns.

Moreover, the fact that the private partner also undertakes the responsibility for maintaining the projects results in services of higher quality, with greater functionality throughout the project's life cycle.

Enhancement of the investment environment

PPP schemes mobilize more funds than those that the public sector alone could mobilize, providing, hence, the opportunity to various parties and investors of the private sector to get involved in infrastructure projects, innovate and develop new activities. The long-term nature of PPP projects results in setting up financially stable companies with predictable cash flows. These cash flows feed the market and thus promote the growth of the economy.

Features of Public Private Partnerships

The selection of the private partners that will undertake a PPP project is made through an international public tender. PPPs are implemented through contractual agreements, whereby all the aspects of a project, not only during its construction period but also during its operational phase, as well as the obligations of the two contracting parties, are clearly set and agreed upon. At the end of the contractually predefined operational period the projects implemented under a PPP scheme are transferred from the private partner to the Contracting Authority.

Project's financing and reimbursement

Upon the termination of the tender, the private partner selected creates a Special Purpose Vehicle (SPV) that will undertake, according to the scheme of the partnership:

- the finalisation of the design of the project,
- its construction, and
- either the operation and exploitation of the project or its maintenance according to the contractual agreement.

The SPV signs an agreement with the Contracting Authority, whereby all aspects related to the project are regulated and its financing is secured. Typically, the financing comes from, to a small extent, the private partner's equity and to larger on from bank loans.

The SPV undertakes the responsibility of constructing the project's infrastructure (construction, renovation of existing infrastructure, installation of equipment, etc) and the provision of pre-agreed services during the life of the contract, using either own resources or subcontractors that meet the criteria determined by the Contracting Authority. During the project's life, the SPV is paid either through regular instalments by the Contracting Authority (availability payments) or through fees paid by the end users. In turn, it gradually repays the loans it has obtained and, provided that it records profits, it distributes dividends to its equity investors, based on the yield on its equity. "AEGEAN MOTORWAYS" (AYTOKINHΤΟΔΡΟΜΟΙ ΑΙΓΑΙΟΥ) is such an example. "AEGEAN MOTORWAYS" (AYTOKINHΤΟΔΡΟΜΟΙ ΑΙΓΑΙΟΥ) is responsible for the part "Maliakos-Klidi" of the PATHE and takes advantage of the motorway tolls for a period of about thirty years.

The roles of the public and the private partner in a PPP

In a PPP scheme, the roles of the public and private partners are clearly determined.

The public partner undertakes:

- the determination of the general PPP scheme
- the evaluation of the private partners' proposals
- the support of the implementation of the project
- the monitoring of the implementation of the project and of the contractual obligations of the private partner

The private partner undertakes:

- the elaboration of the design of the project
- the construction of the project
- the securing of the financial resources
- the management and operation of the project and /or its maintenance
- the transfer of the project to the public sector at the end of the contractual period

In the Table that follows (table 2.1.) one can see the Roles of the Public and the Private Sector with the basic aspects of each category.

Table 2.1. The Roles of the Public and Private Sector in the PPPs

Public Sector's Role		Private Sector's Role	
Formation of Output Specifications	Evaluation	Design	Construction
Approval	Support/Monitoring	Financing	Operation

The success of a PPP scheme depends on the efficient and smooth collaboration of all the parties involved both public and private ones.

A. Private Sector

- Construction Companies
- Banks / Financial Institutions
- Operators
- Advisors

B. Public Sector

- Interministerial PPP Committee
- Contracting Authorities
- Special Secretariat for PPPs, Ministry of Economy and Finance

The Legal Framework of Public Private Partnerships (PPPs) in Greece

Law 3389/2005 introduces a new legal framework for the implementation of Public - Private Partnerships in Greece. This legal framework aims at regulating the implementation of projects and the provision of services through PPP schemes. Specifically, the law defines the Public Entities that can implement partnership contracts with Private Entities, in areas falling within the scope of their competence.

Law 3398/2005 aims at providing incentives for both public and private entities, so as to engage themselves in PPPs for the construction of infrastructure or the delivery of services, when it can be demonstrated that this procurement method delivers value for money for the public sector. This Law defines the minimum content of a PPP contract, with a clear description of the rights and obligations of both parties, regulates specific issues, such as financing, participation of public entities in

partnerships, the payment mechanism, the granting of permits, the protection of the environment, the treatment of archeological findings, expropriations and cases of projects undertaken by Public Utility companies.

Moreover, legal issues related to these partnerships, such as the transfer of claims, validity of sureties in rem, taxation and resolution of disputes (arbitration) are clearly defined. According to the new legal framework, parliament ratification of PPP contracts is no longer required, while specific issues related to risk allocation, which were difficult to be dealt with in the past, are efficiently tackled.

The new legal framework provides that under a partnership contract, the Private Entities assume a substantial part of risks associated with the financing, construction, availability of or demand for the partnership object, against payment to be made as a lump sum or in installments by the Public Entities or by final users of the works or services. As such, the financing, in whole or in part, for the construction of the works or the provision of services, is provided by resources and funds secured by the Private Entities that are paid back during the operational period of the projects. Finally, the procurement procedures are in line with the EC Directive 2004/18.

2.3.2. The Public Private Partnerships Unit

Under Law 3389/2005, a Special Secretariat for Public-Private Partnerships (PPP Unit) has been established in the Ministry of Economy and Finance, having the responsibility to identify projects that can be delivered via PPP schemes.

The establishment of this PPP Unit has been based on other similar units already operating in other Members - States of the European Union for the promotion and implementation of PPP projects. The PPP Unit aims at supporting the Inter-Ministerial PPP Committee and Public Entities, while its main tasks involve the following:

- Identification of the works or services that could be implemented or provided through Partnerships and be included under the provisions of Law 3389/2005,
- Evaluation of the proposals submitted by public entities and their subsequent forwarding to the Inter-Ministerial PPP Committee for approval,
- Promotion, in general, of the construction of works or the provision of services through the Partnership framework,

- Facilitation and support of Public Entities in pursuing contract award procedures, as defined in Law 3389/2005, for the selection of Private Entities,
- Monitoring of the implementation of Partnership Contracts.

A Public Entity (Contracting Authority), wishing to implement a PPP project submits a proposal to the PPP Unit, whereby all related technical, financial and legal aspects of the project are outlined. The PPP Unit evaluates this proposal and if the criteria are met it is included in the "List of Proposed Partnerships", a non-binding list with proposed PPP projects that can be implemented via a PPP scheme and fall under the provisions of Law 3389/2005.

For every project included in the "List of Proposed Partnerships" the PPP Unit drafts a short report, addressed to the Inter-Ministerial PPP Committee, outlining the following:

- The financial, technical, socioeconomic and legal reasons that justify the implementation of the projects under a PPP scheme
- The criteria taken into account for the selection of the projects included in the "List of Proposed Partnerships"
- Any actions undertaken by the Contracting Authorities for the preparation of the partnership, such as, for example, the appointment of financial, legal and technical advisors, preliminary designs and drafting of project contracts
- The type of the proposed contract award procedure and an indicative time schedule
- An indicative budget of the project.

Based on the data of this short report the Inter-Ministerial PPP Committee approves and includes under the provisions of Law 3389/2005 the proposed partnerships.

2.3.3. Summary of Approved Projects

Up to date (February, 2008), 34 PPP projects with a total budget of approximately 4 billion Euros have been approved, corresponding to 216 new infrastructure sites.

The majority of these projects will be implemented in the province of Greece, a fact that justifies in practice the role of PPPs as an additional, multidimensional tool of regional development that aims at contributing to the social convergence and cohesion.

The table below summarizes the tendering timetable of all approved projects.

Table 2.2. Presentation of approved PPP projects

Project	NP Value	Status
Public Sector Accommodation		
1	Construction and maintenance of seven new Fire Stations	€38 M PPP tender under way Selection of the PPP contractor: 3 rd Quarter 2008
2	Facility management of four buildings of the Hellenic Police	€36 M PPP tender: 3 rd Quarter 2008
3	Construction and maintenance of 14 new buildings of the Hellenic Police	€181 M - PPP tender for Piraeus Police Headquarters was launched in December 2007 - 8 consortia submitted expression of interest - PPP tender for the remaining 13 police stations was launched in April 2008
4	Construction and maintenance of a Government House for the Prefecture of Fthiotida	€34 M PPP tender was launched in April 2008
5	Construction and maintenance of a Government House for the Prefecture of Achaia	€ 3 6 M PPP tender was launched in April 2008
6	Construction and maintenance of a Government House for the Prefecture of Corinth	€25 M PPP tender was launched in February 2008 - 6 consortia submitted expression of interest
7	Construction and maintenance of a Government House for the Prefecture of Trikala	€23 M PPP tender was launched in February 2008 - 6 consortia submitted expression of interest
8	Reconstruction of the "Domboli" building complex for the accommodation of the services of the Region of Epirus	€23 M PPP tender: 3 rd Quarter 2008

9	Construction and maintenance of the Administration Park building in the city of Alexandroupolis	€26 M	PPP tender: 3 rd Quarter 2008
10	Construction and maintenance of a Government House for the Prefecture of Imathia	€29 M	PPP tender: 3 rd Quarter 2008
11	Construction and maintenance of the new buildings of the Ministry of Economy and Finance, of sports infrastructure and animation park of the Chalandri Municipality, and construction of buildings for the accommodation of services of the Chalandri Municipality	€255 M	PPP tender: 3 rd Quarter 2008
Tourism and Sports			
12	Construction of an International Conference Center in the Faliro Pavilion (Tae Kwon Do stadium)	€65 M	PPP tender under way Selection of the PPP contractor: 4 th Quarter 2008
13	Implementation of 5 sports centers and 2 swimming centers	€67 M	Advisors' tender: 3 rd Quarter 2008
Justice			
14	Construction and maintenance of three new prisons	€238 M	PPP tender was launched in January 2008 - 6 consortia submitted expression of interest
15	Construction and maintenance of two Court Houses	€120 M	PPP tender: by end June 2008
Education			
16	Construction and maintenance of new buildings for the University of the Peloponnese	€89 M	PPP tender was launched in December 2007 - 7 consortia submitted expression of interest
17	Construction and maintenance of 27 new school buildings in the region of Attica	€180 M	PPP tender for the first group of 14 schools was launched in April 2008 - 7 consortia submitted expression of interest PPP tender for the 2 nd group of schools: 2 nd Quarter 2008
18	Construction and maintenance of 31 new school buildings in the region of Central Macedonia	€139 M	PPP tender: 2 nd Quarter 2008
19	Construction and maintenance of 23 new school buildings in the regions of East Macedonia and Thrace, West Macedonia, Epirus and Ionian islands	€76 M	Advisors' appointment: June 2008 PPP tender: 3 rd Quarter 2008

20	Implementation of students residence halls for the University of the Peloponnese	€73 M	Advisors' tender was launched in April 2008
21	Implementation of students residence halls for the University of Thrace	€89 M	Advisors' tender was launched in April 2008
Health			
22	Construction and maintenance of the new Children's Hospital of Salonica	€389 M	PPP tender: 3 rd Quarter 2008
23	Construction and maintenance of the new Oncological Hospital of Salonica	€396 M	PPP tender: 3 rd Quarter 2008
24	Construction and maintenance of the new General Hospital of Preveza	€131 M	Advisors' appointment: June 2008 PPP tender: 3 rd Quarter 2008
25	Implementation of the Rehabilitation and Recovery Center of Northern Greece	€124 M	Advisors' appointment: June 2008 PPP tender: 4 th Quarter 2008
Ports Infrastructure			
26	Installation and operation of security systems in twelve Greek Ports	€342 M	PPP tender: 3 rd Quarter 2008
Environment			
27	Implementation of infrastructure for the Integrated Waste Management System in the Region of Western Macedonia	€117 M	Advisors' appointment: 3 rd Quarter 2008 PPP tender: 4 th Quarter 2008
28	Implementation of infrastructure for the Integrated Waste Management System in the Prefecture of Salonica	€291 M	Advisors' tender was launched in April 2008
29	Implementation of sewerage networks and sewage treatment unit in the Municipality of Rafina	€48 M	Advisors' tender: 3 rd Quarter 2008
Defence			
30	Implementation of residences, nursery schools and sports facilities for the Army and the Air Force	€158 M	Advisors' tender was launched in May 2008
31	Facility Management of the "Evelpidon" military school	€47 M	Advisors' tender was launched in May 2008
32	Implementation and exploitation of a new hotel unit in Methana		Advisors' tender was launched in May 2008

33	Installation and operation of security systems in 23 ammunition dumps	€30 M	Advisors' tender: July 2008
34	Implementation of a flight simulators center	€65 M	Advisors' tender: July 2008

2.3.4. The PPP Unit and the Procedure

Proposal to the PPP Unit

The Public Entity (Contracting Authority) wishing to implement a PPP project may submit a proposal to the PPP Unit, which then evaluates the feasibility of the specific project under a PPP scheme. This proposal should include the following:

- Detailed description of the project that will be provided as a PPP, and its technical characteristics,
- Indicative budget of the proposed PPP project,
- Operation and maintenance cost,
- Schedules,
- Presentation of the proposed PPP scheme,
- Value for Money (VfM) evaluation, which justifies the implementation of the project under a PPP scheme,
- Other issues that influence the implementation of the project, such as legal and environmental.

The above data should provide a reliable indication for the nature of the project, its financing needs and its lifetime. As such, a detailed financial analysis is needed, especially in the case where the private partner bears the demand risk, in order to correctly quantify this risk that affects the anticipated revenues.

The PPP unit analyses the public entity's proposal and determines whether it can be implemented as PPP under the provision of Law 3389/2005. In case that the proposal is positively evaluated, as it was initially submitted or was finally amended with necessary modifications, the PPP unit includes it in the "List of Proposed Partnerships" and notifies the public entity of this decision.

Decision of the IM PPP Committee

If the involved Public Entity decides to submit an "Application for Inclusion" within no more than two months after the date of notification the Minister of Economy and Finance, acting as the President of the IM PPP Committee, sets this application as an item of the agenda of the next meeting of the IM PPP Committee and invites all regular members and the Minister that supervises the involved Public Entity. In this meeting, the report drafted by the PPP Unit is presented to the Ministers, and all necessary and additional information and clarifications are provided, so as to help Ministers to reach a decision. After that, the IM PPP Committee announces its decision, to either approve or reject this application. If the IM PPP Committee decides to approve a partnership, the PPP Unit has to coordinate and monitor all contract award procedures, as defined in Law 3389/2005, so as to select the SPV that will participate in the partnership.

Contract award procedure

Beyond specific regulations with the award of PPP contracts, it must be noted that Law 3389/2005 is in line with the general principles of both national and Community law (equal treatment, transparency, protection of public interest etc), regulating the contract award procedures and the relations of the Contracting Authorities with candidates. The procedures for contract award are either open or restricted. In the case of complex contracts, the process of the competitive dialogue or the negotiated procedure may be applied.

Contracts will be awarded by the Public Entity acting as Contracting Authority either on the criterion of the tender being the most economically advantageous or on the criterion of lowest price. The minimum qualifications and abilities of the tenders who participate in the contract procedure are clearly defined by the Invitation to Tender.

The Special Secretariat for PPPs

The Special Secretariat for PPPs was set up in the Ministry of Economy and Finance along with the ratification of Law 3389/2005. This Unit follows the structure

and role of equivalent units in other Member States of the European Union for the promotion and implementation of PPPs. The mission of the Special Secretariat is the provision of support and assistance to the Inter-Ministerial PPP Committee and to public entities, while its main tasks involve the following:

- the identification of the works or services which might be constructed or provided through Partnerships and be included under the provisions of Law 3389/2005,
- the evaluation of the proposals submitted by public entities and their subsequent forwarding to the Inter-Ministerial PPP Committee for approval,
- the promotion in general of the construction of works or the provision of services through the Partnership framework,
- the facilitation and support of Public Entities in pursuing contract award procedures, as defined in Law 3389/2005, for the selection of Private Entities,
- the monitoring of the implementation of Partnership Contracts.

The main responsibilities of the Special Secretariat for PPPs involve the following:

- the coordination of PPP projects that are promoted or planned by Public Entities, by seeking data related with them,
- the evaluation of projects that may be implemented via a PPP scheme according to the provisions of Law 3389/2005, by elaborating data or information gathered from any Public or Private entity,
- the elaboration of the information it receives from professional and business entities or associations, including the Greek Banking Association, the Technical Chamber of Greece, the Economic Chamber of Greece, and the Association of Contracting Companies,
- the study of comprehensive proposals elaborated by Public or Private Entities for the construction of works or the supply of services,
- the monitoring of all financial obligations undertaken by Public Entities, and especially of the future burden upon the Public Investment Programme ,
- the diffusion of expertise to all relevant stakeholders, by preparing and distributing printed material with information and instructions related to

Partnerships, the purposes they serve, the internationally accepted methods of establishing,

- the standardization of documents, which can be used for the needs of the Contract Award Procedures,
- the standardization of all kinds of Partnership Contracts or Ancillary Agreements, in order to assist Public and Private Entities in formulating the terms and conditions of their Partnership Contracts,
- the submission to the Joint Ministers' PPP Committee of proposals intended to improve the legislative framework regulating the Partnerships,
- the coordination of the preparation of studies and the supply of auxiliary services in general to persons recruited pursuant to the provisions of Law 3389/2005.

Pursuant the above responsibilities, the Special Secretariat for PPPs collects the information necessary to decide which projects or services can be implemented through Partnerships, and evaluates the financial and technical parameters, as well as the associated legal and other issues. The Special Secretariat then proceeds to draw up a non-binding list of projects and services ("List of Proposed Partnerships") that may be implemented through Partnerships and may be included to the provisions of Law 3389/2005. For each project or service included in the List of Proposed Partnerships, the Special Secretariat draws up a brief report setting out its rationale for:

- the financial, technical, socio-economic and legal reasons for which it considers that the construction of the specific projects or supply of the specific services ought to proceed by means of a Public-Private Partnership,
- the criteria that it has taken into account to select the specific projects or services that have been included in the List of Proposed Partnerships,
- the actions which may have been taken by the Public Entity involved to meet the needs of preparing the award of the relevant Contracts,
- the form of the proposed Contract Award Procedure as well as the Public Entities acting as commissioning authorities,
- an indicative timetable of the Contract Award Procedure
- a report of the indicative budget of the project or services to be undertaken by the partnership under the Contract.

2.4. Why is the public sector turning to PPP Projects?

The main reason is that state usually has limited funds or has other priorities. At the same time the private sector is thought to ‘produce’ better work or the same work cheaper; is a better manager and takes better account of the risks involved. Also PSP & PFI are utilized; transferring to the private partner those risks that he can better manage; provided services are improved; and assets are better utilized reduces public sector risk. Finally, by taking advantage of private sector innovation, experience and flexibility, PPPs can often deliver services more cost-effectively than other traditional approaches. The resulting savings can then be used to fund other needed public services. The basic motives for PPP implementation are the need to secure state budget allocations; quality improvement of public infrastructure and provided services; mobilization of private sector’s know-how in project planning/implementation; limitation of the project/service operational cost; and finally sharing of financial risks. The expected results of PPPs are: better exploitation of existing public funds; differentiation of the way public infrastructure projects and services are being implemented, in order to advance innovation; increased competition and know-how transfer from the private to the public sector; and the need to guarantee the desirable level of projects’ social benefit and the quality of provided services on a constant basis.

2.4.1. Basic requirements for a PPP project successful planning and implementation

The basic presuppositions are the formation of strong «partnerships», the Public acceptance, and the management transfer from public to private sector and finally the guaranty of meritocracy and the performance evaluation during the contracting procedures. The main contribution of the public sector in the achievement of PPP goals is in the planning process, in the financial preparation of the partnership, and in the political and legislative preparation of the partnership. Additionally the public sector acts as the coordinator that ensures the social benefits of PPP projects. The governments ought not to consider PPPs as «easy solutions» on difficult matters. A lot of efforts should be made to ensure a cooperation context that will lead to success. In the past a lot of efforts have been made for the promotion of PPP in big projects.

2.4.2. Benefits and risks related to PPP projects implementation

The potential benefits from implementing PPP are: cost reduction; risk management and risk assessment; improvement of provided services; and generation of revenue or other indirect financial benefits (economic development reinforcement, employment growth, etc.). The potential risks for PPP are: loss of control by the public sector; political risks; accountability question matters; ill defined and thus unreliable services; lack of competition; and the blurriness in the partners' selection procedure.

2.5. Identification of the PPP success factors

PPP has attracted a lot of attention in the national and EU context. Changes and reallocations in the national and EU budget underline the necessity of increased engagement of private funds. Although EU Member States have different levels of experience and legislation, the general tendency is the increased importance of PPP. Several factors such as public acceptance and strong partners are considered as essential for success. In the near future, the ability of the administrations to create regional capacity for the implementation of PPP at a regional and local level will define the broad-scale success of PPPs. It becomes evident that PPP should become a mainstream option in EU countries with a heavy public sector legacy. However PPPs are not a panacea. Central and regional public bodies must develop the abilities to assess a PPP concept, calculate risks and benefits and decide for the most viable solution.

2.5.1. The INTERCO - PPP Project Partners

The INTERCO-PPP project presents the necessary link between theory and praxis of the project partners.

The project among others aims to the identification of the basic PPP success factors. This identification is based on the accumulated experience of the project partners and the local stakeholders, who transferred their know-how and experiences in the INTERCO-PPP network through the interregional Meetings & Study

Tours organized. The successful (or not) PPP Case Studies (projects) of the project partners, which have been thoroughly analysed, constitute the basic element of this identification procedure.

The PPP projects analysed within the INTERCO-PPP Project

This knowledge exchange process has led to the identification of the following set of twenty (20) factors:

- Formation of “Strong” Partnership Schemes
- Full Understanding / Acknowledgement of the Social Character of PPP
- Public / Community Acceptance
- Political Backing
- Public Interest Observance
- Focusing on MIRR and not on IRR (Private Actor)
- Profit Assurance for the Private Sector
- Management Transfer from Public to Private Sector
- Public Initiative

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- Public / Community Acceptance
- Political Backing
- Public Interest Observance
- Focusing on MIRR and not on IRR (Private Actor)
- Profit Assurance for the Private Sector
- Management Transfer from Public to Private Sector
- Public Initiative
- Knowledge Transfer
- Public Guarantees for Loans
- Quality & Product Standards Definition
- Delimitation of Competence Fields (for the Public and the Private Sector)
- Maturity of Technology / Project Concept
- The Guaranty of Meritocracy and Performance Evaluation During the Contracting Procedures

- Legislative Framework and Empowerment
- Capacity Development at National and Regional Level (Public Officials)
- Compatibility with Structural Funds and National Co-financing
- Establishment of an Independent Authority for Conflict Resolution

Of course, the above-mentioned set of factors doesn't cover all possible factors. It only represents the most crucial ones identified throughout the implementation of their respective PPP projects by the INTERCO-PPP project partners. For a successful PPP approach certain additional conditions have to be considered, such as:

- Distinct regulations are laid down concerning the responsibilities of the parties regarding costs/risks
- Project implement ability
- Favorable economic conditions & available financial market
- Appropriate Risk Allocation
- Effective procurement

2.6. Commenting the suggested factors

2.6.1. Formation of “Strong” Partnership Schemes

The partners could not decide on a common position and the meaning of strong partnership. The long-term character (20-30 years) of many PPPs underlined the need for “durable” partners and partnerships, there where hesitations about the binding character and the intensity of PPP schemes. There is a certain deviation from contractual provisions towards a partnership culture that still has to be adapted in the national and regional contexts of the EU Member States and regions.

•**(Greece):** The role of the public sector in the achievement of PPP results is in the planning process, in the financial preparation of the partnership, and in the political and legislative preparation of the partnership. The public and the private sector work together on basis of clear, contract agreements.

•**(Austria):** It is recommended that partnership schemes should be formed in a way to be able to work within the foreseen timescale sufficiently but not to construct “strong” partnerships that fix the partners in their role like into a corset. Especially the private partner usually doesn't feel comfortable within “strong” partnership schemes.

•**(Sweden):** The successive formulation of strong partnership schemes has been an important success factor, but not only in a contractual perspective, the spirit of co-operation and a mutual interest and commitment in the project has been equally important.

•**(Lithuania):** Dialogue, trust, long-term focus and reciprocal understanding constitute essential characteristics of the partnership culture that is crucial to the success of the PPP process. However, the PPP situation in Lithuania demonstrates the lack of such partnership culture. On the one hand, private sector partners often seek to maximize their short-term profits from the PPP contracts. On the other hand, public sector institutions are often unable to understand commercial interests of the private sector in the PPP process.

•**(Spain):** One of the pillars on which the success of these initiatives lies is that during the drafting phase of the projects the following steps are perfectly defined: the actions to develop, the objectives and goals to reach, the technical, legal and financial implications, etc.

2.6.2. Full Understanding / Acknowledgement of the Social Character of PPP

PPP projects are clearly Public Projects, thus their social character is integral. During the planning and drafting phase this dimension should be clearly communicated to the involved partners and the interested public. A sound approach is to break each project/concept down to its components and decide which parts can be implemented in a PPP scheme, thus sketching the roles of the involved partners.

•**(Greece):** The full understanding and acknowledgement of the social character of PPP is of great importance for the success of a PPP project. It is essential that all involved parties be constantly clarified on this issue. A common misunderstanding regarding PPPs is the nature of the service or product to be provided. Thus many endeavors of private character are usually interpreted as PPPs because the private sector is entering as a partner, e.g. recreation centers. PPPs focus on core tasks of the public sector and examines whether this tasks can be broken down in components, which can be object of a PPP. A typical case can be educational facilities. Whereas the construction and management of buildings can be easily reallocated to the private sector, however operational issues are a much more complex matter.

- (Austria):** In this case the interests of the public and private partners differ. Usually the public partners have social interests and the private economic interests. It is therefore necessary for the private partner to be aware of the social character of the project and vice versa. The public partner must accept the economic interests of the private partner. Both, social and economic interests (and their defined frameworks and borders) should be defined before starting the PPP in order to avoid problems.
- (Sweden):** The project was mainly an energy efficiency and O&M (operation and maintenance) improvement project. The issue of providing better services to the tenants of the city and secured indoor climate were nevertheless important social components that strengthen the project.
- (Lithuania):** As indicated above, the private partners are often unable or unwilling to understand the social character of PPP because their behavior is often driven by profit-maximization on the short-term or long-term basis.
- (Spain):** When the private sector decides to carry out a project of this nature the main aim is to achieve a predetermined economic benefit.

2.6.3. Public / Community Acceptance

Public acceptance is crucial to PPP success taking in account the political dimension and private interests safeguarding towards political changes. At the initial phases the public might be hesitant. Thus the focus of the public debate should be set on the objectives and gains of the PPP and not on contractual details. It is very important to emphasize on the alternatives and especially on the zero option of non-implementation.

- (Greece):** A common issue arising in public discussions on PPP in Greece is the accusation of disguised privatization. Where this fear might be unjustified in many cases it could easily lead to a deadlock. Thus the efforts for community acceptance should follow three directions: a) Clarification on the PPP context (in a manner that can be accepted by the public and not become another factor of suspicion); b) Transparency of the risk allocations, expected benefits and role definition (though respecting the potential demand of the private sector for confidentiality, especially in now-how matters); and c) Promotion of PPP cases that might cause smaller suspicion or disapproval, e.g. waste management instead of real estate development

•**(Austria):** The acceptance of the community is important at least for the political success of a PPP project as it should demonstrate, that the public partner is looking for modern solutions for the benefit of the community. To achieve as much community acceptance as possible it is necessary to make the community getting involved by informing them about the project, in order to create identification with the PPP project.

•**(Sweden):** A PPP in form of Energy Services was not the first alternative that was discussed in the municipality. However, facing the fact that the financial resources for the project were limited, the municipality and its civil servants had to opt for an alternative model that gave the most value for the available money. Despite the fact that there was some hesitance regarding the business model as such, the PPP Energy Service idea was eventually accepted and approved by the political body. Over the time of the contract the community acceptance raised significantly.

•**(Lithuania):** Acceptance from the public is important for the political success of PPP-like projects. The acceptance of PPP arrangements in the Lithuanian public is limited (because of corruption allegations under several previous or ongoing PPP projects). However, the public usually favors better public infrastructure and/or services developed with the application of PPP arrangements in Lithuania.

•**(Spain):** The project's acceptance by the community is vital for its future success. In order to achieve this it is essential that the citizens understand the benefits that they will gain by putting this action in practice.

2.6.4. Political Backing

The landscape of the available Structural Funds in the 2007-13 periods is changed for many NUTS 2 regions. Hence the PPP tool has a clear role in the production of public projects and services. It is crucial to have the “right” political bodies positively involved at the early stages, while citizens support can be regarded as a guarantee for political backing. Finally common suspicion of corruption and privatization, derived by the novel features of PPPs are clearly political and not administrative matters.

•**(Greece):** Greece, as other Objective 1 countries will experience a serious decrease in EU funding in the next programming period 2007-13. Hence whereas PPPs have been an option among others so far, they will rise in importance and necessity. This

will be especially the case for the Region of West Macedonia, which will join the “phasing out” regions. Thus PPP will inevitable enter the political agenda, especially at the regional and local level, since the support at the central level can be taken as granted.

•**(Austria):** Without any political backing and active involvement of policy makers most of PPP projects are convicted to failure. Depending on the kind of PPP it is crucial to have the “right” political bodies positively involved in order to have the necessary political backing. This is important especially if troubles or problems arise and political support is needed to be able to continue the project and also to have opportunities to overcome these problems.

•**(Sweden):** The political backing was not a success factor in this particular case, as Swedish politicians, and in particular local politicians, generally have a limited understanding of and interest in PPP. The project was however initiated and developed by senior civil servants, whereas the politicians were involved only in the later stage of the project development. Eventually they turned up to be positive, but lessons learned are that the political level must be involved in the process much earlier than in this case.

•**(Lithuania):** Political backing for PPP is mixed in Lithuania, depending on many reasons. Also, it is important to note that there is no political backing for PPP projects from the central government. Some Lithuanian politicians and top officials are suspicious about the transparency of PPP and its value added.

•**(Spain):** The political risks that can be generated as a consequence of Spain’s inexperience in PPP (rejection on behalf of the trade unions, the administrative staff or the society who associates PPP with privatization), may lead to the political power showing reticence to develop these projects. However, by the current necessity to collaborate with the private sector to implement some initiatives, the political backing is evident.

2.6.5. Public Interest Observance

Public Interest observance has to be visualized and be exposed to public debate at all possible opportunities. Understandably at the initial stage of the introduction of PPPs as a mean of public policy, projects should be chosen that show clear benefits of the Public Interest, not only on the results level, but also impact

oriented. The general regional context will decide if an Ex-ante (as in Sweden) or Ex-post approach (as in Lithuania) or a certain mix is most suitable.

•**(Greece):** It is imperative that the public sector acts as the coordinator that ensures the social benefits of PPP projects. Social goals have to be met at all times. In relation to the former success factors, the Observance of Public Interest has to be visualized and be exposed to public debate at all possible opportunities.

•**(Austria):** PPP project should be developed in such a way that it will be possible to observe the results regularly to prove that public interest is fulfilled as contracted in the beginning of the partnership.

•**(Sweden):** In the initial phase of the project development the public and the media about the project and its character raised a lot of questions. The media followed the project closely and once the upgrading of buildings as well as a higher level of service to the tenants had become visible, the response from the general public was very cost savings could generate better conditions for the tenants without raising costs or taxes.

•**(Lithuania):** There is limited observance of public interest under Lithuanian PPP-like projects. The design of PPP projects is often not conducive to such observance (with the exception of a few cases). A high level of transparency in the public and private sector and the effective exercise of accountability and control from the public are required in Lithuania.

•**(Spain):** PPPs are currently awakening an outstanding interest among the population and companies of the region. The citizens show a high degree of interest in the programmes aimed to reinforce the innovation implemented jointly by the public and private sectors because they can provide benefits for the region.

2.6.6. Focusing on MIRR and not on IRR (Private Actor)

The introduction of the MIRR element clearly signals the departure from a “traditional” contract-fulfillment approach to the point where the private partner is actively engaged in the success of the PPP. In general when expectations are met the demand for MIRR is possible, however, when unexpected failures are encountered, the Public partner is expected to offer solutions. Some partners considered the IRR approach to be more suitable when starting with PPPs. In any case the MIRR concept underlines the importance of the long-term commitment and the clear definition of the standard of services to be provided.

•**(Greece):** In accordance to the above-mentioned issues, the long-term reinvestment of the private sector must be motivated and facilitated. This element has a strong capacity building element in it. The partners should be able to renegotiate and extend their partnerships focusing on the objectives of the PPP and deviating from the “traditional” contract-fulfillment approach.

•**(Austria):** The welfare of the PPP project should have first priority. As long as the PPP project is developing in the foreseen way in case of rates of return, the focus on MIRR is possible. But in case of problems the internal rate of return has first priority.

•**(Sweden):** These issues had not been discussed in detail with the contractor. But since this project was considered as a bridgehead into the municipal sector to create confidence for the business model, is lightly the contractor internally used the IRR model, and not the somewhat lower return rate that normally become the result of when using the MIRR model.

•**(Lithuania):** No information is available whether the private actors focus on MIRR rather than on IRR. Usually IRR is applied during the project design stage. However, the nature of PPP-like projects implemented in Lithuania underlines the long-term commitment and the clear definition of the standard of services to be provided.

2.6.7. Profit Assurance for the Private Sector

A profit assurance for the private sector could prove to be contra productive. The level of profit for the private sector cannot be contractually guaranteed, but determined by a combination of competition during the tendering stage and operational efficiency of the private partner during the implementation stage.

•**(Greece):** Commercial goals have to be met at all times. The private sector can additionally provide some useful concepts such as minimal turnover guarantee etc. However, these approaches might be a political liability and offer ground for debates beyond the scope of the PPP project.

•**(Austria):** In many PPP projects it is not possible to assure profits in long term. Therefore it is necessary to discuss and clarify between public and private partners before the start of the PPP project what to do in the case of less or no profit or even in the case of loss of capital.

•**(Sweden):** Since being an EPC (Energy Performance Contracting) project the contractor did not have any guaranteed profit assured in the contract. But with a

thorough and good analysis, the risk for the contractor was in reality limited. The third party financier had however its revenues and profits assured due to separated EPC and financial contracts.

•**(Lithuania):** Since all contractual provisions are not fully available, it is difficult to determine any profit assurance for the private sector. However, such provisions are unlikely to be found under most PPP-like projects in Lithuania.

•**(Spain):** The agreement between public and private organizations is established to cooperate in the rendering of a service, to distribute risks and responsibilities fairly, to contribute joint resources (time, financing, knowledge) and to achieve mutual benefits. While the private sector pursues financial profitability, the public sector wishes for social success.

2.6.8. Management Transfer from Public to Private Sector

There is no general rule defining to which extent the management of the PPP will be transferred to the private sector. However, the management unit should be public initiative, e.g. setting up “private” units within public administrations. In any case the public sector should seek to acquire managerial know-how from the private partner and incorporate it in its structures.

•**(Greece):** One of the main reasons for PPP is the management transfer to the private sector. Even if the management remains in the public sector, it is beneficial to the project to set up “private” units. This model has been reproduced several times in Greece and has been proved to be successful in most cases and through different scales.

•**(Austria):** In most cases the management of PPP projects is done by the private sector. In some cases of smaller PPP projects there are positive experiences with a “privatized” management which means that the management is installed by the public partner but with a private contract, that is the management is not part of the public body.

•**(Sweden):** The management transfer from the public to the private sector was not a key issue for success in this case. However, the substantial training efforts and close co-operation between the municipality’s personnel and the contractor’s Key Account Managers boosted the management competence, and strongly supported the success of the project.

•**(Lithuania):** The transfer of management occurred under both the Vilnius city heating supply and city car parking projects. The relative success of the Vilnius city heating supply project is associated with strong performance of the experienced private operator, including good strategic and operational management of district heating services.

•**(Spain):** The partnership benefits from the experience that the private sector has in management techniques. The PPP takes advantage of the strong points of the private sector in order to improve the efficiency and to achieve savings through the economic management.

2.6.9. Public Initiative

All PPPs are based on a public initiative. However the public initiative should focus on the goals to be met and not the implementation methodology, which should be the task of the private sector.

•**(Greece):** There are a few cases, where initiative came from the private sector. However, the need for political support and the social character of PPPs, it is beneficial to present any PPP as a product of Public Initiative.

•**(Austria):** Experiences show that most of the PPP projects came out from a public initiative - in many cases because of lack of capital, lack of management know how or lack of personal capacities. Therefore, public bodies are recommended to screen PPP possibilities that reside within their tasks.

•**(Sweden):** There was no main public initiative behind the success of the project and its PPP business model. Nevertheless there was a public initiative initiating the project, as the municipality had to reduce the costs for energy and O&M by 10%, which in turn triggered the civil servants to seek creative solutions due to the lack of financing.

•**(Lithuania):** Main PPP-like projects are launched at the initiative of public sector institutions (primarily larger municipalities rather than the government). International financial institutions supported the preparation of the Vilnius city heating supply project.

•**(Spain):** The main promoter of these cooperation formulas is the public administration, due to the gradually growing necessity to cooperate with the private

sector in order to develop projects with social profitability, to render services and to provide public infrastructure in the most efficient way.

2.6.10. Public Guarantees for Loans

Here a departure from the role of the state in “traditional” contracts is necessary. The role of the public could be either as a lever for competitive interest rates, either on the banking market or through special funds. The new regulation on the Structural Funds mentions new financial engineering approaches, which could be

(Greece): A common argument in favor of PPPs is the envisaged know-how transfer from the private to the public sector. However, this element has certain limits. While the public sector should be able to adopt some of the business models from the private sector, the objective should not be the development of private sector skills. Since the general tendency in public administration is the formation of slim public organizations, the main focus should be in the creation of competent and efficient units.

•**(Austria):** Organized knowledge transfer from private to public partners makes sense only if the public partner is willing and able to overtake at least parts of the private partner. If this is not the case knowledge transfer is making less sense. The same is true the other way round. But of course a minimum mutual understanding and therefore knows how transfer is necessary in order to run the PPP project successfully.

•**(Sweden):** As described in ‘Management transfer from public to private sector’ the capacity to manage both complex technical systems as well as organizational processes developed further in both the municipality and in the energy service company.

•**(Lithuania):** The transfer of knowledge among public sector partners, private sector partners or between them is limited. Private sector partners are competing in the PPP market, which is dominated by one group of companies

•**(Spain):** A moderate level of knowledge transfer is necessary from the private to the public sector in order to establish an atmosphere of mutual agreement, to reach the best potential of the initiative and to have good relations between the agents of the partnership. PPPs have a learning curve because the knowledge is acquired throughout their implementation.

Chapter 3. Infrastructure and Growth

3.1. Introduction- Basic definitions and meanings

It is observed that European governments show a special interest in infrastructure since the beginning of the European Union or even from the years that it was called European Economical Committee. This interest in infrastructure coincides with a new wave of trade integration, which is related with the Maastricht treaty.

At this point it is useful to compare the definition of public infrastructure, which includes transport, telecommunications, law and other. Moreover there are two basic categories of public infrastructure:

- a. Domestic infrastructure (concerning a certain country) and
- b. International infrastructure, a global thematic.

Infrastructure interacts in an interesting way with the other determinants of industrial location examined in the economic geography literature. Arrow, Kurz, Barro, ChrisCanaleta C., Arroz P., Carate M., Gramlich E., Gruber S., Marattin L., martin P., Rogers c., Nijcamp P., Puga D., Rietvold P., Spiekermann K., Wegener M., Short J., Kopp. A. and Vickerman R. are the main scientists that have examined Infrastructure and Growth. His own supporting work and that of Holtz-Eakin, Munell, Narayana Kockerlakota and Ke-Mu Yi, Fernald and Rafael Flores de Frutos and Alfredo Pereira has followed Aschauer's initial papers. These papers have in turn generated a raft of criticisms from authors as Henry Aaron, Charles Schultze, Hulten and Schwab, Rubin, Dale Jorgensen and Tatom. One should not forget Arrow, Kurz, Barro, Christaller, Lösch, Isard, Biehl, which are regional scientists and many economic historians as for example Chinitz that have for long studied the role of public infrastructure in regional development and in the process of industrial concentration. Most of the above mentioned authors are presented in this chapter.

3.2. Presentation of Edward Gramlich's review essay on Infrastructure

The Review Essay concerning Infrastructure Investment written by Edward Gramlich begins with a general setting upon economists that try not to be faddists but they often cannot avoid it. The usual pattern observed is that a reasonably important topic will be ignored for the longest time and then recognized and finally the subject

will get its importance after a long run. The author believes that a prospective importance of a topic occurs with disappointing frequency.

Edward Gramlich believes that David Aschauer changed all that by writing a series of papers in the year 1989 and examines econometrically infrastructure investment that turned down and aggregated productivity. His work hit those who had worried about the productivity puzzle and those who were worried about late rates of U.S. national saving.

There are many possible definitions of infrastructure capital. The definition of infrastructure capital that makes the most sense from an economics standpoint consists of large intensive natural monopolies such as highways, other transportation facilities, water and sewer lines and communication systems. An alternative version that focuses on ownership includes just the tangible capital stock owned by the public sector. Broader versions include successively human capital investment and/or research and development capital. Most econometric studies of the infrastructure problem have used the narrow public sector ownership version of infrastructure capital as their independent variable. This is mainly due to the fact that it is very hard to measure anything else.

There are eleven (11) basic categories presented in Table 3.1. that suggest why economists might have a trouble analyzing infrastructure capital. The services of capital such as highways and schools are generally not sold on the market. While infrastructure capital is purchased on the market at the time of initial construction or installation, it is not often sold, implying that economic rates of depreciation are almost never directly measured. Depreciation measures used in the construction of infrastructure stocks are physical measures based on service lives of different types of public structures.

Table 3.1. PUBLIC INFRASTRUCTURE CAPITAL, 1991 (Billions of current dollars)

	Item	Federal	State and Local	Total
1.	Nonmilitary structures	242.8	1791.3	2034.1
2.	Highways	16.9	708.0	724.9
3.	Education	1.2	318.8	320.0
4.	Other buildings	33.7	224.3	258.0
5.	Hospitals	11.7	50.0	61.7
6.	Water and Sewers	-	295.5	295.5
7.	Conservation	143.4	35.9	179.3

8.	Industrial	25.7	-	25.7
9.	Other	10.1	158.7	168.9
10.	Nonmilitary equipment	61.0	146.6	207.6
11.	Military	514.1	-	514.1
	Total	817.9	1937.9	2755.8
Source: BEA, in Tatom (1993)				

“Is there a shortage of Infrastructure Capital?” wonders the author. He believes that the most important question involving infrastructure investment is not whether there has been a shortage of infrastructure investment, but rather whether government policies regarding infrastructure investment should be changed. There have been four ways of trying to determinate if there is or was such a shortage:

1. Engineering assessments of infrastructure of infrastructure needs
2. Political measures based on voting outcomes
3. Economic measures of rates of return
4. Econometric estimates of productivity impacts

The engineering Needs Assessments are presented below in Table 3.2.

Table 3.2 ENGINEERING ESTIMATES HIGHWAY AND BRIDGE INVESTMENT NEEDS (Annual costs, Billions of 1982 Dollars)

	Study	Year	Period	Investment Need
1.	Assoc. Gen. Contractors	1983	1983-2002	65.4
2.	Cong. Budget Office	1983	1983-1990	27.2
3.	Joint Economic Committee	1984	1982-2000	40.0
4.	Fed. Highway Admin.*	1989	1987-2005	34.5
5.	Fed. Highway Admin.**	1989	1987-2005	25.1
6.	Capital expenditures	1982		19.1
7.	Capital expenditures	1987		29.0
Source: Peterson (1991)				
* Full constrained needs. Assumes that some urban needs for road widening cannot be met because of the difficulty of acquiring rights of way				
** Necessary to sustain current performance				

As for concerning the Political Voting Outcomes state and local officials themselves report their biggest hurdle in building new infrastructure capital is in gaining the approval of voters. Roughly twenty (20) per cent of all new state and local construction must be approved by referenda, which suggests that referenda voting might prove a good way to identify and measure infrastructure shortages.

The economic approach to infrastructure investment involves computing all the benefits and costs of projects and then their rate of return. If the effective real rate of return exceeds the going real interest rate, the investment is worth-while. Alternatively if the net present value of project benefits evaluated at the going real estate rate is positive the investment is worth-while. The latter statement assumes that the going real interest is the proper rate for evaluating project benefits. The methodology for computing real rates return and the implied present value of net program benefits has been around in one form or another for decades it is surprising how few careful calculations of rates of return are available for infrastructure investment (see Table 3.3.).

Table 3.3 PERCENTAGE REAL RATES OF RETURN ON HIGHWAY INVESTMENT

	Investment	Rate
1.	Projects to maintain current highway conditions	35
2.	New urban construction projects	15
3.	Upgrading sections not meeting minimum standards	5
4.	New rural construction projects	Low
5.	Fix sections above minimum standards	Negative
Source: CBO (1988)		

Even though macroeconomic studies might seem to be one of the least efficient approaches for determining infrastructure gaps, econometrics is what economists like to deal with and these studies have commanded a great amount of attention.

The basic production function was:

$$Q=AF(K,L)$$

Where K is the stock of private capital, L is the labor force, and A is an index representing total factor productivity.

Aschauer and others continuously make a function of the services provided by the government capital stock (G), representing it as:

$$Q=A^*F(K,L,G)$$

Where A^* is total factor productivity purged of the influence of the government capital stock. Using the Cobb-Douglas form and writing in logs gives:

$$\ln Q = \ln A^* + a \ln K + b \ln L + c \ln G$$

The author believes that previous studies have not provided convincing answers to the question if there has been an infrastructure shortage and moreover they have not focused on the right question in the first place. Even if we assume that there was no doubt of an infrastructure shortage it is not clear what infrastructure policy or policies on general should be changed which means that finding no evidence of shortage would not mean that no policy should be changed. So the basic question that merges is if any policies should be changed. This is a common way in which decisions about whether to invest in infrastructure capital are made. States and localities propose bond issues and voters decide whether to build the structure. Due to the fact that voters are deciding it is hard to say there is a structural policy defect here. But voters are influenced by the financial and other terms of the deal and these are set by governments and could be altered. The most important way in which this is done now is by federal grants, but other restrictions on whether and under what circumstances state and local governments can impose user charges can also be altered.

The above comments suggest some general reforms in federal grant programs for infrastructure investment. But if it were possible to impose user fees on infrastructure facilities, which it certainly is for highways and other transportation infrastructure, many higher education structures, hospitals, many water and sewer systems, some conservation structures, and some industrial structures, it would be possible to do even better than to have revamped federal grants finance the infrastructure investment.

3.3. Basic aspects of Diego Puga's Review essay

In this chapter two (2) papers written by Diego Puga are summarized. The one is titled "European regional policies in light recent location theories" and the other "The rise and fall of regional inequalities".

Diego Puga in both papers describes the trends in Europe and the U.S. and discusses how recent location theories can help us to explain them and to reconsider

the role of regional policies, especially transport infrastructure improvements, in such an environment. The author believes that despite large regional policy expenditures, regional inequalities in Europe have not narrowed over the last decades and by some measures have even widened. Income differences across States have fallen but inequalities between regions in each State have risen. European States have developed increasingly different production structures. European regions have also become increasingly polarized in terms of their unemployment rates.

The main instrument of EU regional policy, the Structural funds, is articulated around three “objectives” Objective 1 is promoting the development and structural adjustment of regions whose development is lagging behind. Objective 2 is supporting the economic and social conversion of areas facing structural difficulties. Objective 3 is supporting the adaptation and modernization of policies and systems of education, training and employment. Nearly one quarter of European Union’s (EU’s) live in regions eligible to receive assistance under “Objective 1” of the Structural Funds, the main instrument of EU regional policy. The criterion for eligibility is to have a GDP per capita below 75 % of the EU average. There are also large disparities across the regions of the EU in terms of their unemployment rates. Belgium, Finland, France, Greece, Italy, Spain and the UK all have a difference of at least 700 basis points between the unemployment rate of their highest unemployment region and that of their lowest unemployment region.

The basic transition probability matrices of GDP per capita and unemployment rates relative to EU average are presented in Table3.4. that follows.

Table 3.4. TRANSITION PROBABILITY MATRICES OF GD PER CAPITA AND UNEMPLOYMENT RATES RELATIVE TO EU AVERAGE

1995 GDP per capita							
1987 G.D.P. per capita	30(n)	[0-0.6)	0.83	0.17	0.00	0.00	0.00
	19(n)	[0.6-0.75)	0.21	0.47	0.32	0.00	0.00
	50(n)	[0.75-1)	0.00	0.18	0.68	0.14	0.00
	53(n)	[1-1.3)	0.00	0.00	0.13	0.72	0.15
	18(n)	[1.3-oo)	0.00	0.00	0.00	0.17	0.83
			[0-0.6)	[0.6-0.75)	[0.75-1)	[1-1.3)	[1.3-oo)
1996 unemployment							
1	21(n)	[0-0.6)	0.81	0.19	0.00	0.00	0.00

	23(n)	[0.6-0.75)	0.52	0.26	0.09	0.09	0.04
	42(n)	[0.75-1)	0.24	0.29	0.26	0.21	0.00
	32(n)	[1-1.3)	0.06	0.22	0.34	0.19	0.19
	32(n)	[1.3-oo)	0.00	0.00	0.16	0.22	0.62
			[0-0.6)	[0.6-0.75)	[0.75-1)	[1-1.3)	[1.3-oo)
Source: (Unemployment table) Overman and Puga (2002).							

The distribution of European unemployment rates has become increasingly polarized: there are now more regions with either very high or very low unemployment and fewer regions in between as compared with the middle 1980's. Overman and Puga (2002) argue that this polarization of regional unemployment rates could be driven by three factors:

- a. Different reforms in national labor market institutions
- b. A within-country polarization of labor supply and
- c. A within-country polarization of labor demand.

They show that national considerations do not play the main role in explaining regional unemployment outcomes. In fact the unemployment outcomes of individual regions are much closer to the outcomes of neighboring regions (domestic and foreign) than to the average outcomes of other regions within the same member state. Regarding changes in labor supply, these have not caused the polarization of unemployment rates and in contrast they have mitigated. They show that changes in the spatial distribution of labor demand have in a great amount pushed polarization and that these changes are similar across geographical neighbors.

3.4. Vickerman R. et all's views

3.4.1. Vickerman's R. (1995): "The Regional Impacts of Trans European Networks" - Article review

This article is dated in a period that European Transport infrastructures were in their early stages of formulation, so it has an early concern on them. The main issue of the paper "The Regional Impacts of Trans European Networks" is to indicate the effect of transport TENs on the development of the Community's regions. The

interest of author is concentrated on the impacts that TEN have on European integration process based on the two principles of subsidiarity and cohesion.

Trans European Networks starting point were the recognition of the need of an overall planning structure in the community, which will provide and develop Infrastructure Networks of European Interest. Those networks eventually were extended in all the modes of transport (rail, road, air, ports) and further developments related the interconnection among the different modes establishing the combined transport.

According to the author, transport TENs arises out of the long history of trying to develop an appropriate financial instrument for dealing with EU infrastructure needs. TENs are considered not only as a key element in the process of EU integration, but also as a key building block in progress of convergence and cohesion. The primary objective of Transport Trans-European Networks is the enhancement of the advantages of Single European Market and ensuring a more equitable distribution of regional benefits, by linking peripheral regions to the central regions of community. However author provides that policy is needed both to compensate disadvantaged regions and to restrain development in advantaged regions, as long as there is a division among the effects that transport infrastructures have in “poorer peripheral regions” and in “congested central regions”.

Objective of this paper is to highlight the different tensions among proponents and opponents of major new infrastructure programmes and to indicate some issues emerging from TEN developments.

As regards the tensions coming out from the development of TENs, the author in four groups classifies those. The first one is called “centralization versus peripheralization” by giving an emphasis in what happens either in a peripheral or in a central region after a transport investment as far as “market effects” is interfaced in space. Peripheral regions to be benefit need to have some other advantages and policy responses, however, both centralization and decentralization tendencies can be set in force by transport improvements.

The second one is called “connectivity versus location”. This tension is based on the opinion that location is always a strong factor, which determines the development of a region; even its accessibility is improved. There are some cases in peripheral regions where improved connections cannot push the development. This is mostly explained by the fact that the most peripheral regions suffer by purely

intraregional networks. In those regions the absence of high quality roads, classic rail and well-developed modern combined transport will contribute to increasing tension between core urban centres and the non urban peripheral periphery.

The third tension is called “mobility versus sustainable development”. It is concentrated in the fact that mobility should have some limits especially among the more developed central regions. The explanation is that increased mobility has external effects, which surpass the limits of sustainable development. “Planning versus competition” is the last tension indicated by the author. However the planning of new enhanced networks should be focused on the interest of development, the presence of private capital cause a conflict.

3.4.2. Vickerman R. (1996): “Location, Accessibility and Regional Development: The Appraisal Of Trans-European Networks” - Article review

This paper indicates the difficulty of accessing the Trans European Network’s effect in regional development. It is based on previous observations of author, which provide his concern about the efficiency of TEN in providing convergence. Emphasis is giving in the progress of evaluation in transport investments before materialize them. This procedure will improve the equilibrium point among the planning possible proposed TENs in order to satisfy their purpose.

The role of infrastructure in regional development is important but difficult to determine quantitatively, so the focus of the paper is on improving the appraisal framework for new transport infrastructure. To do so, authors are investigating different measures of accessibility and an improved indicating model. This approach is dealing with:

1. The treatment of regional performance in modern economic models
2. A review of the ways infrastructure and especially transport infrastructure has been defined, measured and incorporated into models of regional economic performance
3. After taking into account the industries’ production and markets there is developed a new approach to an indicator based on the transport needs of a region’s needs
4. The way in which the use of such an indicator could be used in appraisal to assess their regional impacts of new infrastructure in Europe.

This paper is concerned primarily with the way in which infrastructure, and transport infrastructure in particular, affects accessibility, industrial location and hence regions' growth and development in Europe. It is to be investigated if infrastructure as the typical policy instrument that regions perceive as necessary to overcome relative isolation is a factor of development.

As regards the industrial location, paper looks at the treatment of regional performance in modern economic models in which the allocation of industry depends on two interrelated features, the existence of increasing returns and the differential importance of transport costs to different sectors. The author is based on those models to found its own, which explores this factor of development.

As regards transport and accessibility it is difficult to identify the precise nature that infrastructures affect regional development. On one hand there are the non-spatial impacts, which are simply the effects of infrastructure investment on the aggregate level of economic activity, productivity and competitiveness in an economy. On the other hand, spatial impacts consider the way in which infrastructure can lead to differential performance in different locations, either between regions or within regions.

For infrastructure to have an impact it must serve both the sectoral and the geographical needs of the region, including the relevance of infrastructure other than that within the region. This implies a model integrating the features of accessibility/potential models, input-output models and production function models with an explicit trade model. To measure the impact of infrastructure and accessibility for understanding and predicting the process of regional development incorporation of measures of distance, speed, and time effects is necessary. However the way that infrastructure affects the amount of production consumed in the transmission of goods from one place to another is also important to predict regional development.

To be useful in appraisal regional impacts of a certain new infrastructure, such an indicator has to be sensitive to both the needs of the individual region and to the needs of the nation or EU as a whole. The model has to satisfy both the economic logic of location and regional development and the political realities of cohesion and subsidiarity. It is important the disaggregation of planning level and to determine the way in which industries within a sector use infrastructure, which can only be seen in a model which disaggregates by mode.

**3.4.3. Vickerman R., Spiekermann K. And Wegener M. (1999):
“Accessibility and Economic Development in Europe” Article review**

This paper is an earlier work of Vickerman, Spiekermann and Wegener that presents the concern about the relation among accessibility and economic development in Europe. Accessibility in European level is an issue covered by transportation TENs, so authors are giving a clear and documentary approach of the impacts of development of high-speed rail in socio-economic convergence. The empirical evidence in this paper is based on the High-Speed rail accessibility as far as it is argued that it represents the TENs philosophy and the claims are based on forecasting accessibility models. The oppositions of this paper are mainly based and aligned on the observations that Vickerman indicates in his previous work.

The theoretical debate concerning the impact of transport infrastructure on regional development is among the claims of Maastricht treaty about convergence and the fact that disparities increased between central and peripheral regions. Authors highlight the difference between the objective of improving global competitiveness of EU and the objective of socio-economic cohesion through the development of TEN. On one hand when the object is global competitiveness then the proposed TENs, which mainly connect central with peripheral regions, are successful. On the other hand when the object is socio-economic cohesion, this could not be succeeding by the same way. “Improving the links between the central and the more peripheral regions may make it easier for firms to market their products in central regions, but also enables producers in these central regions to invade peripheral markets previously protected by their remoteness. At the same time the tendency to link the major cities of the peripheral regions into the higher-level European networks may be increasing the disparities between these cities and their hinterlands in peripheral regions”.

The question is if the implementation of TEN (High speed rail) is likely to contribute to spatial polarization or whether peripheral regions development will be stimulated by their linking with the European core. Two methodological approaches are used to give a certain question as regards the accessibility. Authors, however give an emphasis in the kind of measures of accessibility and by making a benchmarking among the existing measures end up in those two methodological approaches providing sufficient measures of accessibility. Firstly, forecasting “time-space maps” showed that accessibility in EU in 2010 (forecast year) would bring in a cut of time of

5 hours all the core regions and in the same time minimize the travel time spent in all EU. Secondly “Accessibility surfaces” is a method based on two accessibility indicators generated in combination with GIS (Geographical Information System). Those indicators are the “population potential” and the “daily accessibility”.

The gravity model for the population potential showed that there are considerable disparities in accessibility in 2010 after the development of high-speed rails. Urban regions have the highest accessibility and rural areas the lowest. Accessibility decreases from the city centres towards the surrounding rural areas. Moreover the areas in central Europe both urban and rural have a higher population potential than regions in European periphery. This result indicates that the Trans – European high-speed rail network will increase the existing disparities in population potential in Europe in absolute terms.

The second gravity model for the daily accessibility shows that whether the number of persons that can be reached within five hours will greatly increase, but disparities between urban and rural areas and between core and periphery not only remain but also increase.

3.5. “Infrastructure and Regional Development: A Multidimensional Policy Analysis” by Nijcamp P. (1986) - Review Essay

This paper investigates the relationship between infrastructure and regional development based on the “regional development potential theory”. This article represents a very early concern about infrastructures in a European level as far as those then began to be a major policy instrument of the European Regional Fund. So, provides a methodological framework and an empirical analysis of the expected impact of infrastructure in regional development. This framework is used to identify the impacts of infrastructure on regional development in the Netherlands during 1970-1980. The results of the analysis will be used to formulate some general conclusions about effectiveness and usefulness of infrastructure as an instrument in European and Dutch regional policy.

Infrastructures are regarded in this paper in a broad sense as (material and immaterial) public capital. Infrastructure is only one of the instruments for improving the development of a certain region. Nevertheless, it may be a very important one, because it constitutes the foundation of many other socio-economic activities in a

country or region. Thus, infrastructure policy is a conditional policy for regional development: it does not guarantee a favourable regional development, but it creates the necessary conditions for an achievement of regional development objectives.

Nijkamp, however is concerned on the quantitative measurement of the effects that such a policy instrument has in regional development due to the lack of an overall theoretical background. Author is trying to fill this theoretical gap by providing a new modern version of growth theory named “regional development potential theory”. This theory gives emphasis in the potential of a region and on the factors that introduce it. Theory suggests that regional development potential depends in general on:

- **Regional potentiality factors** (such as availability of natural resources, locational conditions, sectoral composition, international linkages and existing capital stock)
- **Mobile production factors** (such as various kinds of labor and new investments).

In this framework, infrastructure capital is essentially a public, immobile regional potentiality factor, which may be either material or immaterial. The emphasis of the regional development potential theory on public capital is extremely important for regional infrastructure policy, as then public policy may become an effective tool in coping with the problem of spatial disparities.

An emphasis is given in the different stages that a region could be as regards the level of development. In each stage a typical and specific "package" of infrastructure endowment can be identified. Based on empirical evidence, network infrastructure is particularly important during the first stages of the development. During the next stages, also urban infrastructure is becoming more important while finally social infrastructure may play an important role. It is also an empirical fact that the average infrastructure equipment in richer areas is usually lower than in less wealthier areas.

In general is extremely important to extend regional production functions (explaining differences in regional efficiencies regarding production and income) by means of potentiality factors (among others infrastructure equipment) in order to identify disparities among regions with an approximately equal private capital stock. This leads to the notion of a so-called quasi-production function. The notion of the

quasi-production function takes for granted that regional product is determined by traditional (substitutable) production factors (such as capital and labour) as well as by specific regional determinants (such as agglomeration, sectoral structure and infrastructure). More specific a quasi-production function, based on a Cobb-Douglas specification, will be used in our empirical analysis to give answer in what extent does infrastructure contribute to regional development.

3.6. Martin's P. and Rogers' C. paper titled "Industrial location and public infrastructure - Review Essay

The paper, titled "Industrial location and public infrastructure" deals with the impact of public infrastructure on industrial location in the case that increasing returns are present. Firms tend to locate in countries with a better domestic infrastructure and high levels of international infrastructure as well as strong returns to scale magnify industrial relocation. The last is observed due to differentials in domestic infrastructure or capital endowments. As an impact we have relocation of firms led by regional policies, which finance domestic infrastructure in a poor country. As contrast regional policies that finance international infrastructure in a poor country leads firms to abandon a country.

During the past years many new important infrastructure projects have been developed throughout Europe. For example the Channel Tunnel, the high speed rail network, transalpine base channels, new telecommunication networks, training networks and education infrastructure. It is important to notice that this interest of European governments in infrastructure coincides with a tending wave of trade integration marked by the building of the internal market and the Maastricht treaty. Moreover the changes in Eastern Europe have also revealed that an important obstacle to the integration of these countries in the global economy is the bad condition of their infrastructure.

The authors propose a new way to model different types of public infrastructure, which allows the analysis of the impact on trade patterns, industrial location, welfare and the incentives for countries to inhibit industrial relocation.

Poor infrastructure imposes costs on trade within and between countries (this is the difference from Krugman's modeling on transport costs which only affect international trade). Not only transport and telecommunications but also such things as

law and order qualify as public infrastructure. If infrastructure is poor then the national or foreign purchaser will not actually consume a large portion of the goods produced and traded.

There are two basic conclusions concerning this paper. The first conclusion is that firms of the increasing returns sector will tend to locate in countries with the best domestic infrastructure when trade is integrated, in order to take advantage of economies scale. Also it is notified that infrastructure interacts in an interesting way with the other determinants of industrial location examined in the economic geography literature. In Europe, the EC Commission views the wide regional disparities in infrastructure both at the national level and between EC as a major impediment to real convergence (see Biehl, 1986). Because of this concern, the EC regional policies (the structural funds and the new cohesion funds created by the Maastricht Treaty) are mostly used to finance new infrastructure in transport, telecommunications, education and energy in the poorest regions.

A regional policy of financing domestic infrastructure will always bring industrial relocation to this region. However a regional aid program that improves international infrastructure in the poor country brings more rather than less industrial concentration and may therefore contribute to regional divergence. Finally, a country with poor infrastructure may want to restrict industrial location that follows trade integration since the higher cost of goods produced outside the country because of relocation dominates the income effect for capital owners who can benefit from investment in the good infrastructure country.

The model is a variant of Helpman and Krugman (1985) and Krugman (1991). There are two countries. In each country, a representative consumer chooses from a menu of goods to maximize the utility function. The models departs from earlier models, such as Arrow and Kurz (1970) and Barro (1990) in which infrastructure is an input in the production function. The above-mentioned models cannot address the role played by infrastructure in regional integration because they do not capture the function of infrastructure in facilitating trade within and between countries. In Martin's and Rogers' model infrastructure intervenes in the relation between the firm and the consumer and therefore its main impact will be through demand. In the models of of Helpman and Krugman (1985) and Krugman (1991) as well as Arrow's and Kurz's (1970) and Barro's (1990) models cannot address the role played by infrastructure in regional integration because they do not capture the function of

infrastructure in facilitating trade within and between countries. In contrast the examined model infrastructure intervenes in the relation between the firm and the consumer and therefore its main impact will be through demand.

3.7. Conclusions

The characterization of the authors of public infrastructure as affecting the amount of output that actually reaches the consumer captures a key role played not only by transport but also by other types of infrastructure. If law and contract enforcement of telecommunication networks are weak this will also divert real output from consumption. In the context of the examined model telecommunication networks as well as transport infrastructure that facilitates domestic trade can be classified as domestic infrastructure. One other view is that the building of a harbor or of an international airport or the improvement of the trade administration or of the international telecommunication system would be interpreted as improvements of international infrastructure. In all these cases both imports and exports are facilitated. There is no way to distinguish between “export” infrastructure and “import” infrastructure because it is difficult to think of many types of infrastructures that would facilitate exports but not imports and vice versa. The main distinction made in this model is between domestic infrastructure and international infrastructures because the focus is on the role of infrastructure in facilitating transactions with the assumption that neither domestic nor international infrastructure are affecting the production function. Public infrastructure should reflect some resource constraint of the governments.

Chapter 4. Transport and Economic Evidence

4.1. Introduction

“The regional economic impact prediction, as a consequence of construction of interregional highways, displays some particularities in comparison with other infrastructures or general public interventions. These particularities result from the general change of spatial relationships and the difficulty of the ex ante long term determination of the “direction” in which some changes will move”.

(Polizos S., Interregional Highways and Spatial Economic Changes: A methological Approach, Τεχν. Χρον. Επιστ. Εκδ. ΤΕΕ, ΙΙ, τευχ. 1&2 2001, τευχ. 1&2 2001, Techn. Chron. Sci.J. TCF, ΙΙ, Νο1&2, page 38)

4.2.Viable touristic development

Tourism is an economic activity which if not developed after a certain planning; it is very likely to bring unfavorable consequences as much to the natural, as to the economic and social environment of the touristic areas. In a period during which the evolution of technology, the economic augmentation and improvement of the standard of living led to the augmentation of free time, to the facilitation of transportations and therefore to the augmentation of touristic demand, a rational planning is necessary for the touristic sector.

Planning for tourism must aim to the effort of environmental preservation, which attracts and develops tourism, in order to guarantee the duration and the positive consequences from its expansion. The policy for tourism must aim to the maximization of the benefits and the minimization of the negative consequences. A priority must be the attenuation of phenomena such as the space and time over-centralization of the touristic activity and the weakness of distribution of demand in the dimension of space and time.

The social activities, the economic activities and environmental conditions, in any geographical space, European-national-regional-local, constitute an important factor for the configuration and application of the touristic policy.

Relatively to the touristic environment and concerning it, the “viable development” on the reception locations refers mainly to:

- * The need for economically viable practices.
- * The need for practices that guarantee the human needs.
- * The need for environmentally positive practices.
- * The need for practices that promote an improved quality of life.

Viability in tourism, like the other economic activities, has three interconnecting sides: the environmental, the socio-cultural and the economic. Furthermore, the viability indicates duration. Therefore, viable tourism presumes a rational use of natural resources, respect of biodiversity, minimization of the adverse ecological, social and cultural consequences and maximization of benefits for the environment and the local societies.

As viable touristic development is determined the touristic development that is actuated equally in the local, social, economical, cultural and environmental structure of every touristic area, by forming in parallel terms (services, infrastructure, know-how) for the continuous feedback. Viability in tourism focuses in subjects, such as:

- * The equality of the local society, referring to the standards of living and quality of life.
- * The satisfaction of needs and desires of the tourists and the needs of the tourist industry.
- * The protection of the resources that constitute the base of tourism (natural and anthropogenic environment).
- * The conservation or improvement of competitiveness of touristic industry.

In the literature for viable tourism a great emphasis is given to the comparison of this example with mass tourism that prevailed in the past and which, despite the contribution of the economic regional prosperity

Table 4.1 Distribution of data of the agricultural sector in the prefectures of Greece (the surfaces are in thousands of hectares)

Prefectures	Lowland agricultural area	Sub-mountainous agricultural area	Mountainous agricultural area	Total of agricultural area
Attica	31,6	58,4	3,9	93,9
Aetolia-Acarnania	51,4	48,2	20,9	120,5

Kalogirou Vassiliki - Evaluation of the Financial Consequences of Land Slip in Tempi Valley

Boeotia	73,7	31,3	8,9	113,9
Euboea	49,8	40	18	107,8
Evrytania	0	0	10,1	10,1
Phthiotida	56	71,2	25,6	152,8
Phocida	2,7	9,3	6,6	18,6
Argolida	22,2	19,4	29,2	70,8
Arcadia	13	26,5	29,7	69,2
Achaea	39,3	16,9	40,1	96,3
Ilia	96,7	21,6	17,2	135,5
Corinthia	21,5	24,3	38,6	84,4
Laconia	37,5	45,8	13,8	97,1
Messinia	64,8	39,3	26,1	130,2
Zakynthos	97	6,5	0,2	16,4
Corfu	23,4	11,3	0	34,7
Kefallinia	6,9	5,4	3,9	16,2
Lefkada	2	3,2	6,8	12
Arta	18,4	4,5	10,4	33,3
Thesprotia	2,6	8,8	9,6	21
Ioannina	5,8	12,4	21,6	39,8
Preveza	16,3	5,9	8,4	30,6
Karditsa	90,5	5,3	14,2	110
Larissa	177,8	40,2	20,3	238,3
Magnesia	45,3	23,8	20,7	89,8
Trikala	33,3	12,3	19,7	65,3
Grevena	7,8	25,8	11,7	45,3
Drama	29,2	21,2	6,9	57,3
Imathia	62	3,5	6,9	72,4
Thessalonica	128,2	27,6	4,9	160,7
Kavala	24,9	19,5	11,6	55,7
Kastoria	9,9	12,8	8,9	31,6
Kilkis	98,2	13,7	3,1	115
Kozani	40,1	40,6	17,7	98,4
Pella	70,6	8,8	14,6	94
Pieria	37,5	15,6	4,6	57,7
Serres	125,7	35	9	169,7
Florina	32,6	9,5	11,2	53,3
Chalkidiki	46,8	44,3	6,8	97,9
Evros	143,6	18,6	5,6	167,8
Xanthi	39,1	4	5,6	48,7
Rhodope	62,3	16,7	8	87
Dodecanese	24,5	13,1	5	42,6
Cyclades	16,7	21,7	7	45,4
Lesbos	44,4	20,4	14,4	79,2
Samos	2,4	3,6	12,7	18,7
Chios	7,8	4,7	3,9	16,4
Heraklion	68,8	40	36,4	145,2
Lasithi	7,5	26,1	23,3	56,9
Rethymno	12,7	11,1	25,5	49,3
Chania	22,9	16,8	22,7	62,4

Source :ΦΥΣΙΚΟΙ ΠΟΡΟΙ, ΠΕΡΙΒΑΛΛΟΝ & ΑΝΑΠΤΥΞΗ, Αραμπατζής Γ. και Πολύζος Σ.

Table 4.2 Distribution of data of the agricultural sector in the prefectures of Greece (the Gross added value is in billion drachmas)

Prefectures	Average plot area (hectares)	Gross added value for agriculture, livestock, forests (year 2001, billion drachmas)	Total of gross added value	Number of employed in agriculture
Attica	0,469	68,952	15368,12	38802
Aetolia-Acarmania	0,977	88,989	261,15	71635
Boeotia	0,844	84,087	246,77	32339
Euboea	0,603	75,895	222,79	44710
Evrytania	0,473	5,156	15,13	5238
Phthiotida	0,983	103,279	303,09	42809
Phocida	0,463	11,157	32,74	12117
Argolida	0,787	52,714	154,69	29614
Arcadia	0,624	38,487	112,94	25837
Achaea	0,749	75,380	221,21	47561
Iliia	0,907	106,585	312,79	48662
Corinthia	0,507	59,376	174,25	37633
Laconia	0,811	53,627	157,37	36884
Messinia	0,582	77,151	226,41	53236
Zakynthos	0,608	11,900	34,92	11217
Corfu	0,317	18,427	54,07	25082
Kefallinia	1,129	9,510	27,90	7802
Lefkada	0,344	5,417	15,89	7138
Arta	0,514	20,399	59,86	24122
Thesprotia	0,978	12,207	35,29	12883
Ioannina	0,650	42,101	123,55	18087
Preveza	0,747	19,251	56,49	15641
Karditsa	1,286	99,689	292,55	34339
Larissa	1,249	160,770	471,81	50459
Magnesia	0,890	84,381	247,63	27979
Trikala	0,924	85,256	250,20	29880
Grevena	0,799	27,110	79,55	8105
Drama	0,783	43,557	127,80	12521
Imathia	0,815	50,299	147,60	31710
Thessalonica	0,790	102,717	301,44	33129
Kavala	0,546	44,439	130,40	23503
Kastoria	0,577	18,336	53,81	6021
Kilkis	0,899	31,017	91,02	16588
Kozani	0,582	67,194	197,79	25911
Pella	0,607	70,014	205,47	41166
Pieria	0,747	51,346	150,68	26775
Serres	0,585	96,665	283,68	43249
Florina	0,547	31,190	91,53	10348
Chalkidiki	0,774	50,096	147,01	20785

Evros	0,643	112,310	329,60	31099
Xanthi	0,691	35,662	104,66	19382
Rhodope	0,620	87,680	169,30	34448
Dodecanese	0,467	20,004	58,70	22725
Cyclades	1,065	23,794	69,82	13901
Lesbos	0,468	53,815	157,93	30791
Samos	0,199	12,576	39,90	11525
Chios	0,467	10,151	29,79	9815
Heraklion	0,396	109,681	321,88	79182
Lasithi	0,422	35,719	104,82	27133
Rethymno	0,875	32,470	95,28	25783
Chania	0,835	46,897	137,62	37203

Source :ΦΥΣΙΚΟΙ ΠΟΡΟΙ, ΠΕΡΙΒΑΛΛΟΝ & ΑΝΑΠΤΥΞΗ, Αραμπατζής Γ. και Πολύζος Σ.

Table 4.3 Distribution of data of the agricultural sector in the prefectures of Greece

Prefectures	Irrigated areas (hectares)	Investments in the agricultural sector (billion drachmas)	Number of agricultural tractors (year 1995)	Number of privately owned agricultural machinery
Attica	51,3	82,02	6002,5	3565
Aetolia-Acarmania	11,3	28,65	9566,5	6595
Boeotia	40,5	17,21	9195,5	8015
Euboea	13,4	16,92	7699	3748
Evrytania	2,4	6,90	185,5	84
Phthiotida	52,3	28,94	12386,5	10195
Phocida	5	14,63	953	550
Argolida	22,8	6,24	5557	4209
Arcadia	10,9	6,67	3700,5	2971
Achaea	22,8	9,15	12601,5	3934
Ilia	38	11,51	13000	4851
Corinthia	21,5	6,98	13503,5	5958
Laconia	20,2	8,39	5611	4895
Messinia	11	7,84	11146	4654
Zakynthos	0,5	1,02	3773	1444
Corfu	2,6	2,00	2043,5	1284
Kefallinia	0,5	2,30	2481,5	539
Lefkada	0,8	0,93	612	173
Arta	13,7	21,15	1848,5	1261
Thesprotia	8,2	11,16	754,5	402
Ioannina	10,8	17,38	1251,5	993
Preveza	10,6	17,63	1970	1258
Karditsa	75,6	28,25	9422,5	8395
Larissa	97,2	43,72	15407	13639
Magnesia	18,4	17,57	5143,5	2841
Trikala	41	22,36	6342,5	5435
Grevena	2,2	5,40	1788	1225
Drama	21,8	25,01	5339,5	4221
Imathia	48,4	31,90	13311	8587
Thessalonica	46,4	36,12	12695,5	9562
Kavala	26,5	26,67	5901,5	5319
Kastoria	6,7	6,06	1740	1351

Kilkis	15	22,15	8348,5	6144
Kozani	10,2	14,65	6321	4669
Pella	55,5	63,10	18472,5	14041
Pieria	23,3	25,67	8822	6704
Serres	67,1	54,75	16318	13000
Florina	11,8	13,90	4128,5	3768
Chalkidiki	9,6	19,18	4578	4498
Evros	51,4	54,47	11922,5	9627
Xanthi	23	22,42	3716	3245
Rhodore	28,6	52,42	7904,5	9319
Dodecanese	4,4	9,02	5408	1836
Cyclades	4,4	3,15	4216	971
Lesbos	4,8	8,76	2394	1393
Samos	1,6	3,13	3122,5	233
Chios	1,5	1,54	3603	519
Heraklion	30,7	10,90	32272,5	3607
Lasithi	14,7	5,49	5427,5	796
Rethymno	7	11,70	4705	1013
Chania	13,9	14,30	4638,5	1453

Source :ΦΥΣΙΚΟΙ ΠΟΡΟΙ, ΠΕΡΙΒΑΛΛΟΝ & ΑΝΑΠΤΥΞΗ, Αραμπατζής Γ. και Πολύζος Σ.

Table 4.4 Distribution of data of cultural resources and notable settlements in the prefectures of Greece

Prefectures	Traditional settlements	Notable traditional settlements	Cultural monuments	Monuments of international interest
Attica	2.96	2.19	9.55	14.7
Aetolia-Acarmania	1.26	0.80	3.18	2.24
Boeotia	0.91	0.20	2.58	3.83
Euboea	2.22	1.59	3.48	1.92
Evrytania	1.35	1.39	1.06	0
Phthiotida	2.31	0.40	3.33	0.64
Phocida	2.13	0.40	2.12	2.24
Argolida	0.57	0.20	3.94	3.51
Arcadia	3.35	1.79	5.45	0.64
Achaea	2.39	0.80	2.12	0.96
Ilia	1.65	0.60	2.88	0.64
Corinthia	0.83	0.20	3.33	3.83
Laconia	8.09	16.10	9.7	2.24
Messinia	3.96	0.80	3.03	3.19
Zakynthos	0.52	0.00	0.45	0.00
Corfu	5.31	10.74	0.61	2.24
Kefallinia	1.00	0.60	0.76	0.32
Lefkada	0.96	1.79	0.45	0.00
Arta	1.22	0.80	1.21	2.56
Thesprotia	0.96	1.79	1.36	0.32
Ioannina	3.57	2.58	3.18	1.92
Preveza	0.52	0.99	1.52	0.96
Karditsa	0.44	0.40	0.45	0.00
Larissa	1.00	1.59	1.06	2.64

Magnesia	2.05	4.17	2.42	2.56
Trikala	1.13	1.19	1.21	2.88
Grevena	0.09	0.00	0.15	0.00
Drama	1.22	0.60	0.15	0.64
Imathia	0.09	0.00	0.91	1.92
Thessalonica	0.70	0.60	0.91	3.83
Kavala	2.22	0.00	0.76	2.56
Kastoria	0.30	0.40	0.76	1.92
Kilkis	0.26	0.00	0.00	0.00
Kozani	0.09	0.20	1.52	0.64
Pella	0.30	0.00	0.61	0.64
Pieria	0.26	0.20	0.15	0.64
Serres	1.35	0.60	0.91	1.28
Florina	0.30	0.20	0.61	0.64
Chalkidiki	0.78	0.20	1.67	4.47
Evros	1.52	1.19	0.76	1.60
Xanthi	2.18	0.00	0.15	0.00
Rhodope	4.31	0.60	0.15	0.96
Dodecanese	6.31	10.93	3.33	3.33
Cyclades	9.44	18.49	5.15	5.15
Lesbos	1.83	1.19	1.36	1.36
Samos	1.17	1.19	0.45	0.45
Chios	0.74	2.19	1.06	1.06
Heraklion	3.05	0.80	3.03	3.03
Lasithi	3.00	2.39	1.67	1.67
Rethymno	3.05	1.99	1.21	1.21
Chania	2.79	1.99	2.12	2.12

Source :ΦΥΣΙΚΟΙ ΠΟΡΟΙ, ΠΕΡΙΒΑΛΛΟΝ & ΑΝΑΠΤΥΞΗ, Αραμπατζής Γ. και Πολύζος Σ.

Table 4.5 Distribution of data of touristic resources and infrastructure in the prefectures of Greece

Prefectures	Shoreline	Sand shoreline	Hotel beds	Beds in rented rooms	Total nights (thous.)
Attica	4.17	6.01	71312	5643	6343
Aetolia-Acarmania	3.05	3.35	2476	347	221
Boeotia	0.94	0.59	1005	156	104
Euboea	6.09	5.22	12600	4520	491
Evrytania	0.00	0.00	1187	90	99,5
Phthiotida	1.84	1.08	9741	1400	287
Phocida	1.08	0.79	2985	285	252
Argolida	1.08	1.87	11783	1162	656
Arcadia	0.62	0.79	2011	499	143
Achaea	1.21	2.76	5917	144	545
Ilia	1.26	6.7	5588	744	408
Corinthia	1.39	1.87	8117	184	362
Laconia	3.14	1.67	2800	625	215
Messinia	1.98	5.22	3998	1137	234
Zakynthos	1.1	1.48	6865	5891	558
Corfu	1.95	4.14	30817	23792	2785
Kefallinia	2.28	2.36	3744	2431	288

Lefkada	1.05	1.08	1474	2893	99
Arta	0.49	0.00	391	40	58,6
Thesprotia	0.81	1.58	1385	863	71
Ioannina	0.00	0.00	2486	866	378
Preveza	0.85	2.86	2635	2296	178
Karditsa	0.00	0.00	726	75	80,9
Larissa	0.45	1.58	2450	1752	273
Magnesia	6.62	2.17	13277	8085	655
Trikala	0.00	0.00	2124	275	141
Grevena	0.00	0.00	277	58	14,56
Drama	0.00	0.00	515	10	59
Imathia	0.11	0.00	761	20	107
Thessalonica	1.21	2.86	8627	1101	1177
Kavala	2.42	3.35	7465	4409	444
Kastoria	0.00	0.00	740	22	92,5
Kilkis	0.00	0.00	328	0.001	13,165
Kozani	0.00	0.00	1130	3	114,32
Pella	0.00	0.00	917	0.001	50,11
Pieria	0.76	1.58	6917	3462	206
Serres	0.09	0.69	867	60	96
Florina	0.00	0.00	653	22	115,29
Chalkidiki	4.62	5.81	17666	9976	1046
Evros	1.49	1.58	2510	808	252
Xanthi	0.31	0.99	656	146	96
Rhodope	0.49	1.58	934	90	121
Dodecanese	11.25	4.83	76829	12178	8873
Cyclades	14.76	1.48	24046	17417	863
Lesbos	5.95	4.83	4936	4625	299
Samos	3.47	1.38	7786	449	364
Chios	2.67	1.58	1649	1105	118
Heraklion	1.75	3.05	39229	7185	4043
Lasithi	2.74	4.04	17377	3513	1415
Rethymno	1.17	1.97	14606	3149	1194
Chania	1.3	3.25	11882	5199	803

Source :ΦΥΣΙΚΟΙ ΠΟΡΟΙ, ΠΕΡΙΒΑΛΛΟΝ & ΑΝΑΠΤΥΞΗ, Αραμπατζής Γ. και Πολύζος Σ.

4.3.Economic Impacts

The evidence obtained with respect to the question – What is the impact of charging on economic activity? - Further addresses the timing issue, and leads the research to suggest that the effects on economic activity will be modest and relatively benign overall, except perhaps for some businesses that operate at the margins of profitability. This is based on analysis of the accumulated evidence from:

1. The foundation of existing literature on the economic impact of charging that was developed in the literature review phase of the project (see Whitehead, 2003) and
2. The original research that was undertaken (Whitehead, 2002, Whitehead et al., 2005, in press).

To a reasonable degree the results of these studies were, together, underpinned with in-depth information about transmission mechanisms and influences on travel choice and business decision-making when the network conditions change due to road user charging (and, in limited number of cases, workplace parking levies).

In any event, none of the behavioral studies attempted to appraise the overall net economic benefit that may be brought about by charging within any sort of accounting framework, such as was done in the transport models considered in the literature review.

Even though evidence can now be presented to show that economic impacts will be modest during the period before reduced car journeys by other modes, the timing issue will remain at the heart of concerns expressed by business communities. This is likely to be the case until the proponents of charging have clearly and convincingly, articulated local revenue investment strategies. In this regard, charging schemes in some local authorities will only be successfully implemented if sophisticated marketing and public relations techniques are adopted in advance of proposals.

Chapter 5. Evaluation of the origin-destination tables

5.1. Origin-Destination Charts

The need for movement is the result of the dispersion of the uses of the land in space. Today movement has been increased enormously, because of the fast evolution and development in all the sections. The increase of movement, however, creates many traffic problems while the tolerance of traffic jams and the low level of service decreases more and more. The answer of these problems cannot be the continuous construction of new infrastructure. Initially, there should be a full record of the problems and the reasons that cause them. Then, with the proper elaboration of the data and the development of adequate models the traffic systems must be improved. This, of course, requires a systematic approach and analysis of the problems. Origin – destination matrices are required in order to model traffic routing behavior in networks. For a large number of applications conventional methods for estimating an origin – destination matrix became too expensive to use. To overcome this problem, alternative methods for estimating an origin destination matrix from traffic counts, have been developed.

The basic information for this analysis is the chart of Origin-Destination. The simulation models, having this information and the characteristics of the network try to predict where the traffic jams will occur.

The Origin-Destination Charts are two-dimensional and produce information for the movement that takes place between the various study areas. In the lines of the chart the origin zones are given in the columns the destination zones. The values of the cells have a directional sense by showing the number of movements from the origin zone to the destination zone. The cells of the diagonal represent the movement in the interior of each zone.

The collection of the necessary information in order to create these charts can take place in various ways. The conventional method for the finding of an Origin-Destination chart developed for large-scale research uses a combination of house interviews and field research. However, the high cost, the high requirement in personnel, and the long periods needed for the elaboration of the data and the errors resulting from the sampling eliminate the use of this approach for most of the

applications. Alternative methods proposed for smaller scale research is the field limited research, research of traffic signs, aerial photographs, but they are also considered having a high cost regarding the needs in personnel and data elaboration. All these methods however, with the possible exception of the aerial photographs, are based in sampling and therefore for the evaluation of the full Origin-Destination Chart, a deduction must take place for the whole of the population. Additionally, the above-mentioned methods have another important drawback. They do not have the capacity of taking into consideration the modifications of various factors (change of movement number, change in the geometry of the network, etc.), which have an immediate influence on the considered obsolete and the need accrues to repeat a new one of the above mentioned methods with the forbidding cost.

Because, however, in every research or study there is a fund, time and personnel limitation, the researchers begin looking for alternative methods for the determination of these charts. Taking into consideration the above, we conclude the necessity of use of simplified method for the easy, fast and economic determination of the Origin-Destination Charts. Various such methods are based on measurement of traffic loads on the traffic intersections, one of the most common elements of traffic information. These data are relatively cheap to be collected and are usually used for various reasons (accidents studies, maintenance planning, intersection improvement).

5.2. Presentation of 1997 Doxiades' Transport Survey

The research will be based on the table of origins-destinations that occurred from the 1997 Transportation Survey concerning the vehicle flows from region to region in Greece. The Survey of the office "Doxiadis" (that is addressed in Kifisia-Athens, 13 Aigidon Road) and the Greek Government has financed concerns the daily freight of

- i) Agricultural products (Table 6 Annex C)
- ii) Industrial and chemical product (Table 7 Annex C)
- iii) Minerals, combustibles and lubricants and (Table 8 AnnexC)
- iv) Construction materials measured in tones (Table 9 Annex C).

It is obvious that a lot of data is not included especially concerning the islands of the Ionian and the Aegean Sea and Crete that are excluded.

5.3.Determination Parameters

The main determination parameters that will be used are the flows of vehicles, (meaning the trucks) from region to region and the freight transportation that is involved. Most of the cars diverted the Tempi valley by using the road Larissa→Agiokampos→Stomio but there are no data for the Number of cars diverting the route or the ones passing the Moschohori or Dion tolls (available neither from “AEGEAN MOTORWAYS” nor from the Greek Traffic Police.

The determination parameters are:

F for the Freight measured in tones

T for the time measured in days

D for the Distance measured in kilometers

Q for parameter that multiplies the Freight by the Time

Meaning $Q=F*T$

M for the parameter that multiplies the Freight, the Time and by the Distance

Meaning $M=F*T*L=Q*D$

The four categories of vehicles are:

- i) Agricultural and livestock products
- ii) Industrial and chemical products
- iii) Minerals, combustibles and lubricants
- iv) Construction materials.

The tables that occur are 4 and they concern each category. First of all the primary tables 6, 7, 8 and 9 of the Annex C are multiplied with $365/2=182,5$ days which is the exact six-month period of the Tempi traffic deviation. This way we have the new Freight (F). Continuously the four new tables are multiplied with the route kilometers two times. Two new categories of charts will occur, one with the kilometers of the route via Tempi (Tables 14, 15, 16 and 17 of Annex C) and finally one with the new kilometers via the deviations (Tables 18, 19, 20 and 21 of Annex C).

The eight new tables that occur can be compared in pairs concerning the same vehicle category. Conclusions about the extra kilometers and extra cost are presented in Chapter 6.

5.4.Theory- Matrix of the year 2010

The research will be based on the table of origins-destinations that occurred from the 1997 Survey concerning the vehicle flows from region to region in Greece. All the tables are in Annex C.

Table 1 is the table with the distances between the prefectures of Greece. In Table 2 we have the distances of the regions also but where the cells are in a dark color we have the only passages that have no problems due to the rock falling. Tables 3, 4 and 5 concern the distances of the routes via Agia, Elassona and Mourgani correspondingly.

The first tables are:

Table 6 concerning the Agricultural and livestock products

Table 7 concerning the Industrial and Chemical products

Table 8 concerning the Minerals, combustibles and lubricants

Table 9 concerning the Construction materials.

These Tables have been examined and from them have derived the final tables 14, 15, 16, 17, 18, 19, 20 and 21.

As an assumption we take that:

- a. the first category of vehicles will use the route Larissa→Agiokampos→Omolio
- b. the second category of vehicles will use the route Larissa →Elassona→Katerini
- c. the third category of vehicles will use the route Larissa→Trikala→Grevena
- d. the fourth category of vehicles will use the route Larissa→Elassona→Katerini

The equation parameters are estimated by using statistical data from Greece, from the national Search “Origin-Destination” Matrix that is above presented with the following sectors:

- i) Agricultural and livestock products
- ii) Industrial and chemical products
- iii) Minerals, combustibles and lubricants
- iv) Construction materials.

The basic assumptions are:

1. The vehicles carrying agricultural and livestock products (category i) divert via Agia covering an extra route of 106 kilometers.

2. The vehicles carrying minerals, combustibles and lubricants (category iii) divert via Mourgani covering an extra route of 110 kilometers.

3. The vehicles carrying products of the rest categories meaning industrial and chemical products (category ii) and construction materials (category iv) divert via Elassona. This route is the most surcharging as an extra route of 160 kilometers is being covered.

5.5. Comments

After applying the above methodology occur eight basic tables (Tables 14,15,16,17,18,19,20 and 21) that lead us to the final conclusions that are presented in Chapter 6.

The exact range and content of the Tables of Annex C are:

Table 1. Distances of the prefectures (in km)

Table 2. Distances of affected regions (in km)

Table 3. Distances via Agia (in km)

Table 4. Distances via Elassona (in km)

Table 5. Distances via Mourgani (in km)

Table 6. Daily Freight of Agricultural and livestock products (in ton)

Table 7. Daily Freight of Industrial and chemical products (in ton)

Table 8. Daily Freight of Minerals, combustibles and lubricants (in ton)

Table 9. Daily Freight of Construction materials (in ton)

Table 10. Q concerning Agricultural and livestock products

Table 11. Q concerning Industrial and chemical products

Table 12. Q concerning Minerals, combustibles and lubricants

Table 13. Q concerning Construction materials

Table 14. M concerning Agricultural and livestock products

Table 15. M concerning Industrial and chemical products

Table 16. M concerning Minerals, combustibles and lubricants

Table 17. M concerning Construction materials

Table 18. M concerning Agricultural and livestock products via deviation

Table 19. M concerning Industrial and chemical products via deviation

Table 20. M concerning Minerals, combustibles and lubricants via deviation

Table 21. M concerning Construction materials via deviation

Chapter 6. Conclusions

6.1. Ending Remarks on the PPP Projects

The up to date progress of the PPP institution creates positive prospects for the further implementation of PPPs in Greece. It is now demonstrated in practice that the Greek public authorities have a clear picture of the benefits and the new opportunities that the careful design and implementation of PPP projects can yield for the faster provision of infrastructure and better quality services to the citizens. It is also evident that the private sector considers PPPs as a new field for business activity. The approval of the implementation of a significant number of projects, along with the demonstrated consistency of words and actions, creates substantial investment opportunities that stimulate the interest of many firms for participating in the implementation of these projects.

On top, the rapid development of PPPs renders Greece a focal point for the wider implementation of this institution in neighbor countries. Through the leading position that Greece now has in the European PPP map in the wider region of Southeastern Europe and the Mediterranean, it is an attractive pole that has all it takes so as to foster business activity and maximize benefits for both public and private sector.

The INTERCO-PPP project partners had the opportunity to describe their experiences and reflect on the commonly defined set of Success factors. While different institutional backgrounds and operating frameworks make each project a comprehensive case study, certain common points could be defined:

- The social character of the PPPs, public acceptance, and related political support should be considered,
- Technical / administrative issues should always be separated from the omnipresent political aspects,
- The projects selected should safeguard the interests of all parties, while making clear that success or failure is related to their engagement and risks management,
- PPPs are based on partnerships of equal partners; hence roles, duties, standards and outputs must be clearly defined,
- Legal and institution support at the regional level is essential and last but not least,

- Programmed support in the drafting phase could solve numerous problems at later stages.

While the mentioned factors' list is not exhaustive and reflects only the experiences of the INTERCO-PPP project partners, it forms a useful starting point for public debate for PPPs at a regional level.

6.2. Conclusions concerning infrastructure

Concluding concerning the alleged infrastructure shortage the evidence reviewed in Gramlich's paper is decidedly mixed. The needs assessment approaches and macro time series approaches used to justify big increases in infrastructure spending are flawed in many ways. The basic question is "What should be done about any shortages". The answer is that the best approach is not to try to analyze the numbers and tell how short the supply is and how much national or state spending or grants should be increased. An even more sensible approach is to set up institutional structures that permit state and local governments, the holders of almost all infrastructure capital, to find their own optimal stock. As for the contribution of economic researchers to this new understanding, there are both good and bad news. After years of ignoring the issue, economists following Aschauer did finally find it, giving some more professional gloss to advocacy pieces that up to then were totally from the infrastructure lobby. But the contributions of economists were not all that they could have been. There seems to have been far too much attention to the details of macro production studies which can never answer the relevant policy questions very well and too little attention to more disaggregated rate of return studies and studies of the impact of different types of policy changes. While in a way the problems outlined and discussed here are more at the state and local level than at the federal level, the federal government could help matters in various ways. More importantly the federal government might give policy analysts something to study by doing experiments with policy changes of various sorts to see how state and local governments and their voters will respond. Studying reactions of this sort can redirect the efforts of economists onto studies of just what policy changes are in order.

6.3. Conclusions over Growth in Europe

Economic theory has traditionally explained differences in production structures mainly through differences in underlying characteristics (endowments of natural resources, factors of production, infrastructure, or technology), which make space itself uneven. In its framework, economic integration leads to specialize according to their comparative advantage.

The cumulative causation mechanism modeled by Krugman (1991) relies on the assumption that, when a region does relatively well in attracting firms it is able to attract more workers on the basis of higher wages and better access to a wider range of goods. Blanchard and Katz (1992) show that in the U.S. there is such an adjustment process working through regional migration. This is not the case in Europe where adjustment to changes in regional fortunes takes place mostly through participation decisions (Decressin and Fatàs, 1995).

The migration rates in Europe are significantly low comparing with those of the US (Bentignoli and Pagano, 1999). Moreover they are low by historical standards, especially when compared with the much higher migration rates that were typical for Europe in the 60s. The Single Act came in order to create a single market for goods and workers within the EU Only 1.5% of EU citizens live in a member state different from where they were born. Even in the European countries migration across regions remains very small. There is some arguments as to whether

- a. This is the result of people being reluctant to move
- b. The incentives are insufficient or
- c. Barriers to migration are being to high.

The author wonders what do new economic geography models have to say about the relationship between trade costs and regional inequalities if migration does not occur either due to lack of mobility or to the incentives to move not materializing and presents scientists such as Baldwin, Venables, Krugman, Hirsleman, Akerlof et al and his own views together with Venables (1997).

The main conclusion from the work of Anderson and Forslid, Kind et al, Ludema and Wooton and Baldwin and Krugman is that the benefits of agglomeration make firms less sensitive to taxes and thus allow jurisdictions where firms cluster to tax more heavily. An additional implication is that tax harmonization may benefit

neither rich nor poor regions: it can make rich regions lose tax revenue while making it more difficult for poor regions to attract industry (Baldwin and Krugman, 2000).

Studying the effects of infrastructure investments by estimating aggregate production functions can give us an idea of the impact of an investment on infrastructure of “average past quality”. While useful, this is not always a good indication of the likely impact of future infrastructure investments. This observation is particularly relevant for Europe where the focus of infrastructure investments is shifting from roads to high-speed rail.

Based on the outcomes of the quasi-production function applied in Netherlands regions, some general conclusion can be drawn. The more developed regions tend to have a relative infrastructure bottleneck while less developed regions tend to have an excess capacity of infrastructure. This may imply that in less developed regions, policy efforts are to be made to attract mobile production factors such as private investments and qualified labour. In more developed regions, infrastructure bottlenecks may then be removed. However, agglomeration economies can also explain the over utilization of infrastructure capital in more developed areas. Generally, densely populated industrialized areas tend to have a higher network infrastructure endowment than peripheral, agricultural and less densely populated areas.

The extent to which infrastructure contributes to regional developments varies over time and depends also on the spatial level of analysis and on the overall level of economic welfare. However, locational conditions have become increasingly important in explaining regional employment and growth differences. In that sense, implications of locational perceptions (based on mental maps, e.g.) in the spatial decision-making process deserve more attention. Especially in peripheral regions where spatial discrepancies are likely to be determined by more factors than infrastructure endowment and locational profiles this seems to be a recommendation for further research. Moreover, precise evaluation of the contribution of specific infrastructure investments to regional development is hard to provide.

Based on those three papers of Vickerman, the conclusions are concentrated in the impact that major transport infrastructures and especially TENs have in Regional development of European Union.

Infrastructure can be thought of as having the nature of a public good, which either enhances the productivity of the ‘private’ factors of production or combines

with private capital in an optimal ratio to raise productive potential. The spatial implications of infrastructure have been developed more in relation to the impact of specific infrastructure projects. What new infrastructure does first and foremost is change accessibility. Changes in accessibility lead to changes in the value of a region's economic potential.

Emphasis on some issues emerging by TEN developments is given in the first paper. A fundamental issue is the "Problem of asymmetry". An emphasis is given in the fact that location matters as far as there is always a difference among the way that TEN affect on Central and on Peripheral European Regions. Infrastructure is not the only measure needed especially for the development of lagging behind regions was a package of measure is proposed, however the same package does not have the same effects in all locations.

Another issue is the "focus of development" as far as there is a division among the developmental effects that TEN have in intraregional and interregional level. Either in central and more developed regions or in peripheral lagging behind regions, in intraregional level the distribution of infrastructures occurs to metropolitan areas, advantaging them and causing "corridor effects" which disadvantage the non-urban areas.

It is suggested that there is an additional dimension of classification of regions, cutting across the core-periphery one, which we term corridor and shadow. Corridors are linear regions with good transport, lying on networks; shadow regions are those apart from the networks. This classifies an intra-regional split for a region in any given location and with any given average levels of development concerning the level of transport consumption necessary to serve both the regional market as well as those of other regions. A further distinction can be made between nodal and interstitial places in a corridor. The effect of distance is not monotonic relative to a given centre.

The emphasis on corridors is very significant. The issues to be considered here are the imposition of costs from transit traffic on locations within the corridor, but also the abstraction of traffic away from other routes or corridors and the creation of 'shadow areas' outside the corridors. The effectiveness of this corridor will also depend on the development of other links in the macro-regional network. The balance between the central and peripheral parts of Europe is extremely difficult to assess; for

some networks such as high-speed rail it is clearly biased in favour of more central regions.

For thus author's consideration is about the most appropriate level of planning transport infrastructures. On one hand European planning is needed to indicate infrastructures that meet needs of majority but on the other hand there is an important role of subsidiarity in transport infrastructures, which requires the planning in local level.

The "mode of delivery" is another issue by emphasizing in the need of planning framework for TEN in deferent spatial levels, but also the need of private sector contribution in the planning and in the process of interconnection among different modes of transport infrastructures.

There is a considerable emphasis EU has placed on the development of TENs as an instrument of regional development. This raises two principal questions, the appropriate level at which to coordinate infrastructure planning and how to ensure a consistent means of appraising and financing major infrastructure projects.

As it is already highlighted phenomena such as "corridor effects" are proof of the opposition that TENs cannot succeed the purpose of convergence and cohesion in the European territory. TENs have to be re evaluated and are designed in order to faith this purpose. However the point is a documentary evaluation of TENs that can be covered by the proposed in this paper method. Issues such as the level of planning and the disaggregating evaluation in different modes have to be reconsidered. There is a need for a multi-level decision making framework, consistent with the principle of subsidiarity, but which will require information on the spatial incidence of both costs and benefits. One other issue is the appropriate kind of financial assistance for TENs and if joint ventures between public and private sectors are to be used these will require a careful analysis of the risks being born by each, which again depend on an acceptable set of indicators.

Based on analysis of the two proposed refined indicators of accessibility, generates the effects to regional development of high-speed rail, in all modes of transport. Those conclusions are focused on the relationship between changing accessibility and changing market structure and competition in order to access the full economic impact of new infrastructure.

In general, relative gains in accessibility of peripheral regions may be beneficial to their economic development; however these gains will always be over-

shadowed by the larger gains in accessibility of the regions in the European core. In other words, TENs cannot be unambiguously instruments to promote the cohesion between regions in Europe and the reduction of interregional economic and social disparities. To success this, European transport Policy should be focused on the investment of links within and between the peripheral regions, not in addition to, but at the expense of, transport investment in the European core.

6.4. Final Evaluation

The basic conclusions that occur from the analysis of the Origin-Destination Charts of the year 2010 and especially the ones concerning the deviation routes and the parameters F, Q and M are:

- The prefectures of Thrace and Peloponnese are the most affected ones (see Maps 3 and 5)
- The prefectures of Central Greece and Central and East Macedonia were affected to a smaller extent than the prefectures of Thrace and Peloponnese. The routes that were most affected were the ones concerning Athens.
- The Prefecture of Thessaly was affected. Especially the prefecture of Larissa, which had problems inside its borders. For example Larissa→Pirgetos or Larissa→Papsani, a route of about 22 kilometers was diverted via Agia or Tirnavos or Elassona meaning extra kilometers and difficult and dangerous road with a lot of curves and traffic due to the deviation of PATHE. The only “solution” was a 4 kilometers 3A road from Tempi to Rapsani as a deviation. There were many people (mostly local mayors and other representatives) supporting that this road should be smeared with asphalt but the problem was and remains that the road is inside the limits of the NATURA 2000 region and this is prohibited.
- The regions of Western Macedonia, Epirus and Western Central Greece were not affected as their routes were transit from Domokos or Grevena (Egnatia Odos) or they used the highway of Western Greece (“Ionian” highway) as they usually do.

- The most affected vehicle categories were the trucks as they were diverted as it is analytically presented in Chapter 5 and all the three deviation routes were very difficult to be driven (narrow roads, many curves, extra kilometers, extra cost).
- Another parameter is that the accident and the obligatory deviation routes happened in a period that the country and Greece's citizens were fronting the Financial Global Crisis and the grave measures of the Greek government and the EU.
- The two deviation routes, the one via Agia and the one via Ellassona are similar in kilometers (106 extra kilometers via Agia and 110 extra kilometers via Ellassona) . The deviation road in both cases was not ready to accept so many vehicles (we must not forget that the majority of the cars were diverted via Agia). Moreover the road surface was severely damaged
- The deviation route via Mourgani was an extra 160 kilometers route, which means the most aggravating one. Many drivers preferred it though due to the good condition of part of the road (from Thessaloniki to Grevena, Egnatia Odos). The prefectures that preferred this route were the ones of Western Thessaly, meaning the regions of Trikala and Karditsa.
- Moreover the road surface of all the deviations was severely damaged because these roads were not designed and constructed to resist to such a heavy vehicle load.
- Tourism was affected in general. The region of Tempi (Ambelakia for example) was affected negatively as the only visitors were mostly from the region of Larissa. The regions of Ellassona, Agia and Mourgani were affected positively.

Concluding it is obvious from the data and the examination of the Maps that the most affected routes are the ones related to the PATHE. The Tempi Valley splits the PATHE road and Greece in two parts and this fact together with the peculiar geological shape of the region leaded the country and its transportation to a six-month inconvenience.

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ANNEX A – PHOTOS



Photo 1 The Greek National Road (PATHE) after the rock fall



Photo 2 Closer view of the place of the accident (Tempi Valley) of Wednesday the 16th of December of the year 2009.



Photo 3 View of Pinios River



Photo 4 View of the Tempi Valley

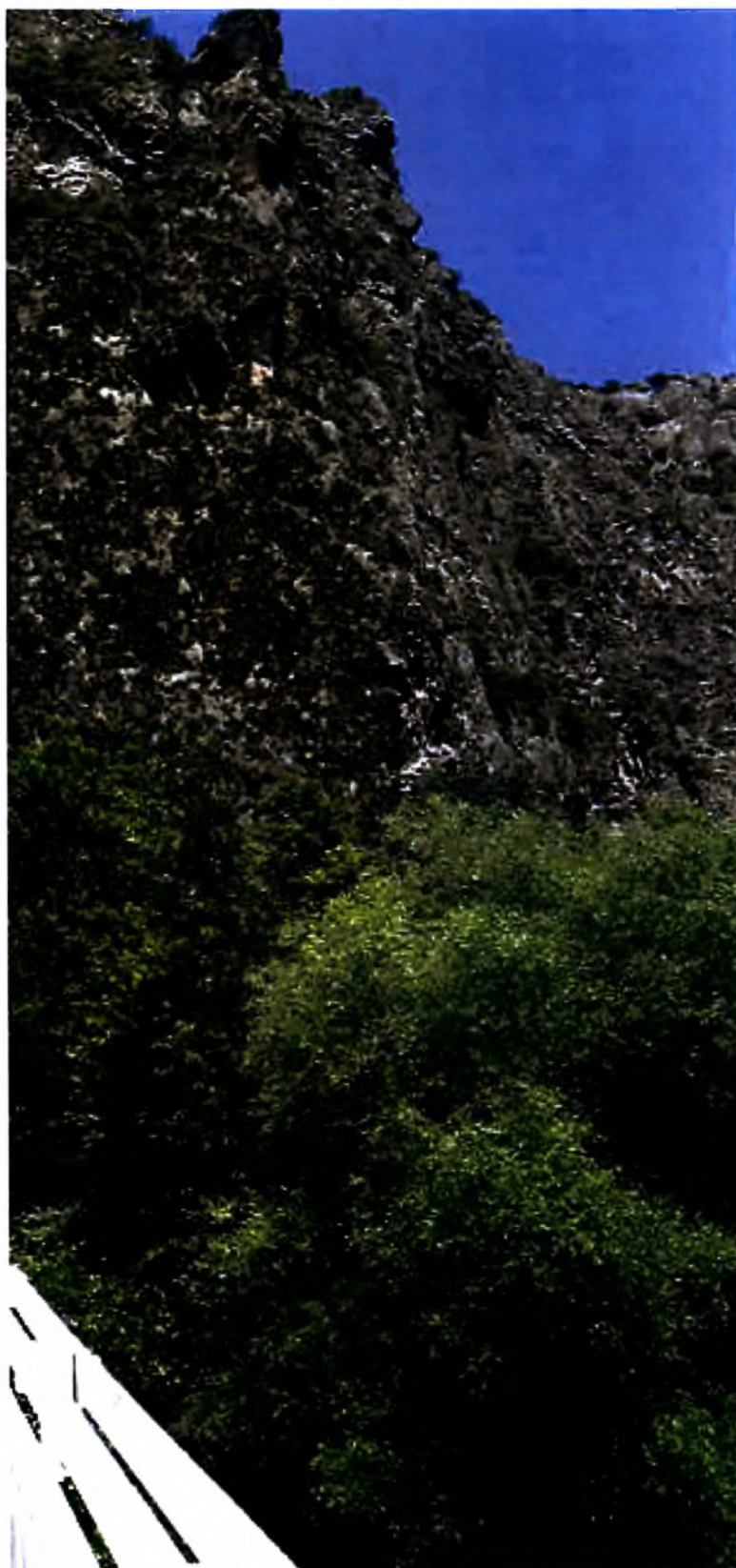


Photo 5 View of the nature of Mountain Olympos from the bridge of Santa Paraskevi (Agia Paraskevi)

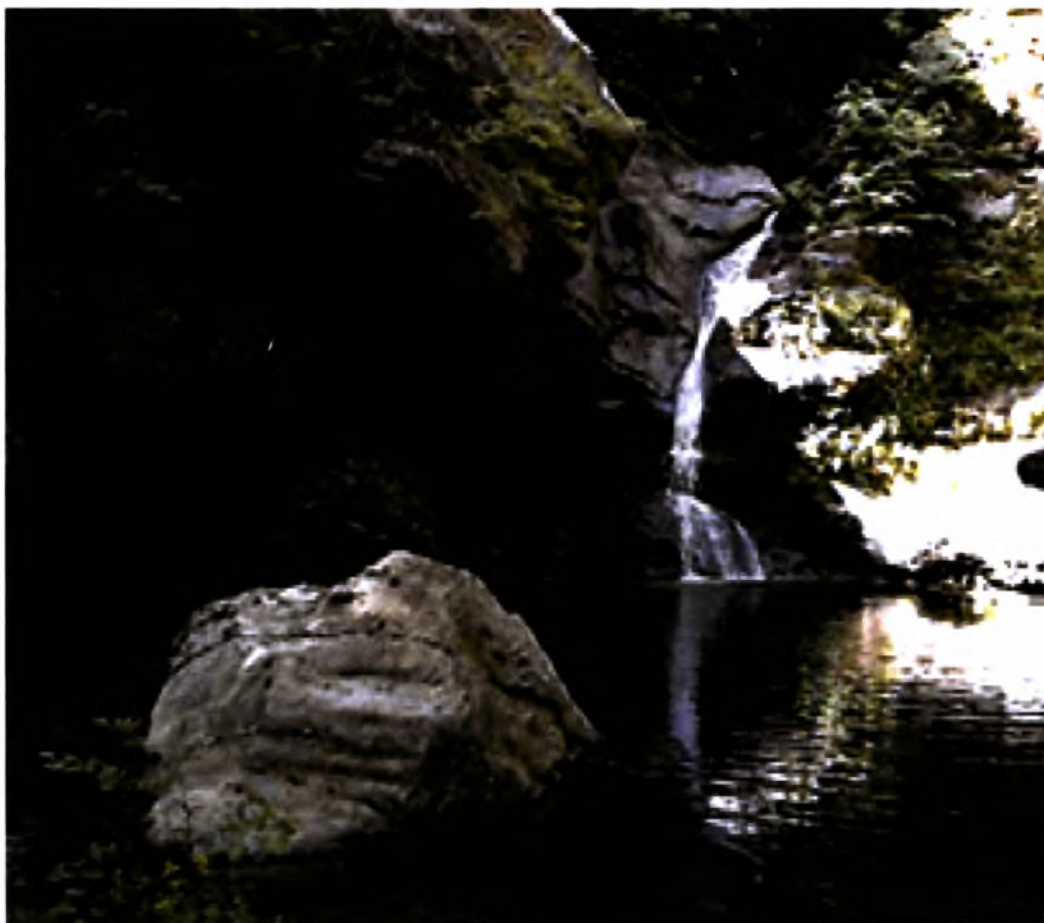


Photo 6 View of the Spring of Diana



Photo 7 View of the Valley of Tempi from Mountain Kissavos (Ossa)



Photo 8 River Pinios

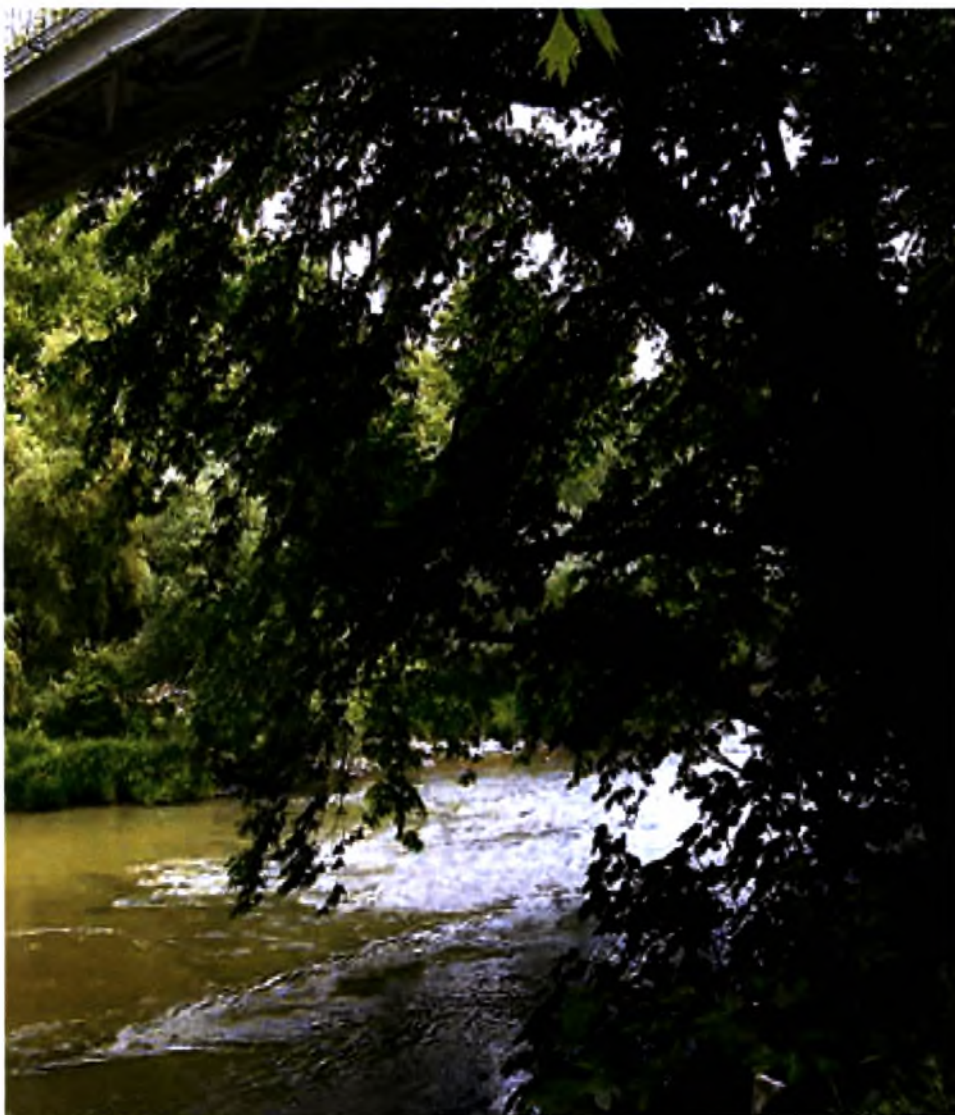
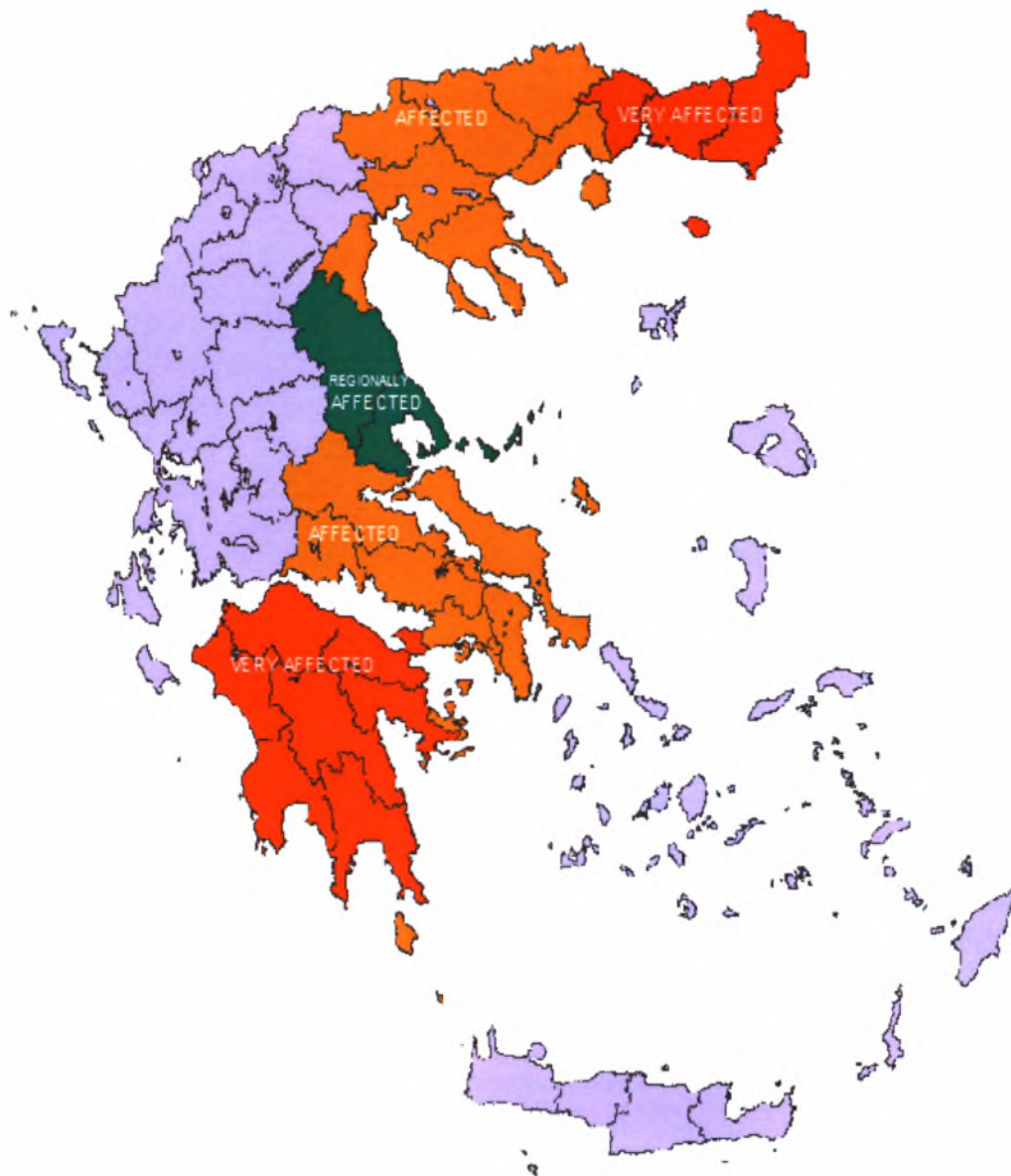


Photo 9 The trees and the water under the bridge

ANNEX B – MAPS



Map 2. Map of Greece (Roads)



Map 3. Map of affected regions (Nomoi)



Map 4. Map of Greek prefectures



Map 5. Map of affected prefectures

ANNEX C – TABLES

Table 1. Distances of prefectures (km)

GREECE	VOLOS	VERIA	TRIPOLI	TRIKALA	THES/NIKI	SPARTI	SERRES	PYRGOS	PYLOS	PREVEZA	PATRA	NAFPLIO	MON/SIA	LARISSA	LAMIA	KOZANI	KORINTHOS	KAVALA	KATERINI	KASTORIA	KALAMATA	IOANNINA	IG/NITSA	FLORINA	EVZONI	EDESSA	DRAMA	ALEX/POLI	AGRINIO	ATHENS	κμ
ATHENS	326	517	194	332	513	254	610	320	337	378	220	165	350	361	215	506	84	682	444	600	284	447	481	592	555	569	668	862	284		ΒΟΛΟΣ
AGRINIO	310	448	258	312	532	318	629	182	308	96	82	283	414	308	195	395	200	701	430	381	302	165	199	481	574	523	707	881		216	ΒΕΡΟΙΑ
ALEX/POLI	563	427	1000	565	349	1060	290	944	1070	824	844	971	1156	503	651	490	946	180	422	569	1064	716	816	515	421	441	218		653	464	ΤΡΙΠΟΛΗ
DRAMA	389	253	826	391	175	886	72	770	896	650	670	797	982	329	477	316	772	38	248	395	890	542	642	341	247	267		466	210	124	ΤΡΙΚΑΛΑ
EDESSA	276	47	713	280	92	773	189	657	783	478	557	666	869	218	364	114	603	261	135	128	777	348	448	74	118		216	651	78	214	ΘΕΣ/ΝΙΚΗ
EVZONI	256	104	639	260	72	753	169	637	763	531	537	646	849	198	344	167	583	241	115	246	757	401	501	192		711	526	60	717	524	ΣΠΑΡΤΗ
FLORINA	293	139	699	233	166	759	263	643	769	450	543	552	886	231	350	86	589	335	209	68	763	320	420		808	97	313	748	175	311	ΣΕΡΡΕΣ
IG/NITSA	371	383	457	247	467	517	564	381	507	103	281	482	613	309	364	330	419	636	392	316	501	100		692	180	595	410	155	597	408	ΠΥΡΓΟΣ
IOANNINA	271	283	423	147	367	483	464	347	473	130	247	448	579	209	264	230	385	536	292	216	467		126	818	113	721	536	143	727	534	ΠΥΛΟΣ
KALAMATA	518	717	90	520	715	60	812	120	53	398	220	163	156	561	413	677	200	884	642	703		404	278	572	414	475	277	354	413	406	ΠΡΕΒΕΖΑ
KASTORIA	301	157	639	173	220	699	317	583	679	346	483	592	795	239	290	94	529	389	232		178	226	100	592	236	495	310	176	497	308	ΠΑΤΡΑ
KATERINI	141	75	578	145	73	638	170	522	648	424	422	531	734	83	229	138	468	242		201	379	216	301	719	133	622	419	73	606	417	ΝΑΥΠΛΙΟ
KAVALA	383	247	820	385	169	880	110	764	890	644	664	791	976	323	471	310	710		229	332	510	209	276	904	96	807	622	156	809	620	ΜΟΝ/ΒΑΣΙΑ
KORINTHOS	354	543	110	356	541	170	638	238	253	316	138	63	266	389	239	503		655	452	341	339	567	441	251	559	154	62	499	158	62	ΛΑΡΙΣΣΑ
KOZANI	207	63	644	147	141	704	238	586	712	360	486	597	769	145	264		150	505	302	193	291	419	293	399	409	302	117	349	304	115	ΛΑΜΙΑ
LAMIA	115	304	349	117	302	409	399	293	419	291	193	302	505	150		264	145	769	597	486	360	712	586	238	704	141	147	644	63	207	ΚΟΖΑΝΗ
LARISSA	62	158	499	62	154	559	251	441	567	339	341	452	655		503	239	389	266	63	138	316	253	238	638	170	541	356	110	543	354	ΚΟΡΙΝΘΟΣ
MON/SIA	620	809	156	622	807	96	904	276	209	510	332	229		710	310	471	323	976	791	664	644	890	764	110	880	169	385	820	247	"383	ΚΑΒΑΛΑ
NAFPLIO	417	606	73	419	622	133	719	301	216	379	201		242	468	138	229	83	734	531	422	424	648	522	170	638	73	145	578	75	141	ΚΑΤΕΡΙΝΗ
PATRA	308	497	176	310	495	236	592	100	226	178		232	389	529	94	290	239	795	592	483	346	679	583	317	699	220	173	639	157	301	ΚΑΣΤΟΡΙΑ
PREVEZA	406	413	354	277	475	414	572	278	404		703	642	884	200	677	413	561	156	163	220	398	53	120	812	60	715	520	90	717	518	ΚΑΛΑΜΑΤΑ
PYLOS	534	727	143	536	721	113	818	126		467	216	292	536	385	230	264	209	579	448	247	130	473	347	446	483	367	147	423	283	271	ΙΩΑΝΝΙΝΑ
PYRGOS	408	597	155	410	595	180	692		100	501	316	392	636	419	330	364	309	613	482	281	103	507	381	564	517	467	247	457	383	371	ΗΓ/ΝΙΤΣΑ
SERRES	311	175	748	313	97	808		420	320	763	68	209	335	589	86	350	231	886	652	543	450	769	643	263	759	166	233	699	139	293	ΦΛΩΡΙΝΑ
SPARTI	524	717	60	526	711		192	501	401	757	246	115	241	583	167	344	198	849	646	537	531	763	637	169	753	" 72	260	693	104	256	ΕΥΖΩΝΗ
THES/NIKI	214	78	651	216		118	74	448	348	777	128	135	261	603	114	364	218	869	666	557	478	783	657	189	773	92	280	713	47	276	ΕΔΕΣΣΑ
TRIKALA	124	210	466		267	247	341	642	542	890	395	248	38	772	316	477	329	982	797	670	650	896	770	72	886	175	391	826	253	389	ΔΡΑΜΑ
TRIPOLI	464	653		218	441	421	515	816	716	1064	569	422	180	946	490	651	503	1156	971	844	824	1070	944	290	1060	349	565	1000	427	563	ΑΛΕΞ/ΠΟΛΗ
VERIA	216		881	707	523	574	481	199	165	302	381	430	701	200	395	195	308	414	283	82	96	308	182	629	318	532	312	258	448	310	ΑΓΡΙΝΙΟ
VOLOS		284	862	668	569	555	592	481	447	284	600	444	682	84	506	215	361	350	165	220	378	337	320	610	254	513	332	194	517	326	ΑΘΗΝΑ
χλμ.	ΑΘΗΝΑ	ΑΓΡΙΝΙΟ	ΑΛΕΞ/ΠΟΛΗ	ΔΡΑΜΑ	ΕΔΕΣΣΑ	ΕΥΖΩΝΗ	ΦΛΩΡΙΝΑ	ΗΓ/ΝΙΤΣΑ	ΙΩΑΝΝΙΝΑ	ΚΑΛΑΜΑΤΑ	ΚΑΣΤΟΡΙΑ	ΚΑΤΕΡΙΝΗ	ΚΑΒΑΛΑ	ΚΟΖΑΝΗ	ΛΑΜΙΑ	ΛΑΡΙΣΣΑ	ΜΟΝ.ΣΙΑ	ΝΑΥΠΛΙΟ	ΠΑΤΡΑ	ΠΡΕΒΕΖΑ	ΠΥΛΟΣ	ΠΥΡΓΟΣ	ΣΕΡΡΕΣ	ΣΠΑΡΤΗ	ΘΕΣ/ΝΙΚΗ	ΤΡΙΚΑΛΑ	ΤΡΙΠΟΛΗ	ΒΕΡΟΙΑ	ΒΟΛΟΣ	ΕΛΛΑΔΑ	

Affected Routes



ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ
ΒΙΒΛΙΟΘΗΚΗ



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