

**ROAD PROJECT EXAMPLE OF METHODOLOGY IMPLEMENTATION FOR  
DERIVING CRITERIA SCORES**

**1. Selected Project Short Description (PHASE A of the methodology)**

The selected project is Greek and it is the “Egnatia Motorway, Section: Komotini - Vanianos”.

**Table 1 (TEMPLATE 2A) – Road and related infrastructure Project Fiche**

<b>Project Name:</b>	
<b>Nature of Project:</b>	<input checked="" type="checkbox"/> New <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Upgrad <input type="checkbox"/> Other
<b>Location:</b>	Egnatia Motorway is the basic under construction road axis that crosses Northern Greece from the Turkish Borders up to the Igoumenitsa port. The specific section, with 47 km length, connects Macedonia prefecture with the Thrace prefecture and more specifically the cities: Kavala, Xanthi and Komotini.
<b>Status of Project:</b>	<input type="checkbox"/> Identification <input type="checkbox"/> Planning <input type="checkbox"/> Study <input type="checkbox"/> Tendering <input checked="" type="checkbox"/> Under Construction
<b>Project Objectives: *</b>	Higher quality of transport, less travel time, higher speeds, inter-connection of the Northern parts of Greece, connection of most important ports of north Greece.
<b>Project Description:</b>	
<b>I. Current average annual daily traffic (AADT)**</b>	
a) All vehicles	14000 vpd
b) International traffic	2000 vpd
b1) trucks	1500 vpd
b2) buses / coaches	400 vpd
b3) private vehicles	100 vpd
c) Domestic traffic	12000vpd
c1) trucks	3000vpd
c2) buses / coaches	2000vpd
c3) private vehicles	7000vpd
<b>II. Projected average annual daily traffic (AADT) (2010)**</b>	
a) All vehicles	16100
b) International traffic	2300
b1) trucks	1725
b2) buses / coaches	460
b3) private vehicles	115
c) Domestic traffic	13800
c1) trucks	3450
c2) buses / coaches	2300
c3) private vehicles	8050
<b>III. Travel costs for private vehicles, for passenger in a bus per km for the section considered (existing and if project is implemented)***</b>	Existing 2,5€/passenger/km.  If project is implemented 3€/passenger/km

<b>IV. Travel time for passengers and for freight for the section considered (existing and if project is implemented)***</b>	Existing travel time, 1h and 15 min. If project is implemented 45min for this section
<b>V. Technical Design characteristics of the existing situation</b>	
a) Part of an international agreement (as AGR) b) Type of road (highway, controlled access motorway, open access motorway, etc;) c) No of lanes d) Length (in km) e) Type of special structures (length of tunnels, length of bridges, etc) f) Existence of tolls / toll fare	It is part of E90 Highway 2 lanes No No
<b>VI. Technical Design characteristics of the project</b>	
a) Part of an international agreement (as AGR) b) type of road (highway, controlled access motorway, open access motorway, etc;) g) No of lanes h) Length (in km) i) Type of special structures (length of tunnels, length of bridges, etc) j) Existence of tolls / toll fare	It is part of E90 Section of an international standard dual carriageway (highway) Each carriageway has two lanes, therefore 4 lanes 47km - (Tunnels and bridges exist in Egnatia, but not in this section) - (Not yet)
<b>VII. Special Infrastructure (freight village, truck / coach terminal, lorry and coach parking, fuel station)</b>	
a) Type of special infrastructure b) Location of special infrastructure c) Area (km2) for special infrastructure	- (Not in this section) - (Not in this section) - (Not in this section)
<b>Estimated Investment Cost (€, 2003 prices):</b>	0,159 billion €
<b>IRR</b>	22%
<b>Expected benefits:</b>	Higher quality of transport, less travel time, higher speeds, inter-connection of the Northern parts of Greece, connection of most important ports of north Greece.
<b>Existing Reports:</b>	Technical Studies, Feasibility Study, Environmental Impact Study
<b>Implementation Programme (years):</b>	<b>Preparation: 4 Expropriation: 2 Construction: 10</b> <b>Total: 16</b>
<b>Implementation Authority:</b>	<b>Ministry of Environment, Regional Planning and Public Works</b>
<b>Funding Sources: (Total number per source or in % of total budget per source)</b>	National funds:20% Bank loan:10% Grants (from EU-CSF): 60% Private sector:10%

## 2. Evaluation (PHASE C of the methodology)

## 2.1 Quantification of criteria

Based on the above project numerical data, as well as on the project's technical, feasibility and viability studies, the measurement of criteria took place.

### A. Measurement of criteria

#### CLUSTER A - Socio-economic return on investment (C<sub>A</sub>)

##### 1. Degree of urgency

A: Immediate requirement (in the next 2 years-until 2005), B: Very urgent (between 2005 and 2010), C: Urgent (between 2010 and 2015), D: May be postponed for some years (between 2015 and 2020), E: To be reconsidered later (after 2020)

In the socio-economic evaluation of the project, as included in the feasibility study, and according to governmental priorities, the project's implementation is characterized as **A: immediate requirement**.

##### 2. Cost effectiveness

A: Excellent (IRR more than 15%), B: Very good (13-15%), C: Good (10-13%), D: Acceptable (4,5-10%), E: Low (less than 4,5%)

Based on the data of section 1, the project's cost effectiveness is characterized as **A: Excellent (IRR higher than 15 %)**.

##### 3. Relative investment costs (costs/GDP)

***The following values do not reflect real values, just presented for illustration purposes only.***

Country's GDP is: 136,3 billion € or **136.300 million €**

Regarding the min and max costs of such project type with similar length in km observed in the country (in million €) are respectively: **110 million €** and **200 million €**

So: A: less than 0,08%  $(=(110/136000)\%)$ ; ...*(intermediate values to be calculated assuming linearity following Figure A-I)*... E: more than 0,15%  $(=(200/136000)\%)$

Based on the data of section 1, the investment cost is 0,159 billion € or **159 million €** Following Figure A-I we have:

X<sub>1</sub>: 110 million €

X<sub>2</sub>: 200 million €

X<sub>3</sub>: 159 million €

Country's GDP = 136.300 millions €

Therefore:

$(X_1/\text{GDP})\% = 0,08 \%$

$(X_2/\text{GDP})\% = 0,15 \%$

$(X_3/\text{GDP})\% = 0,116 \%$

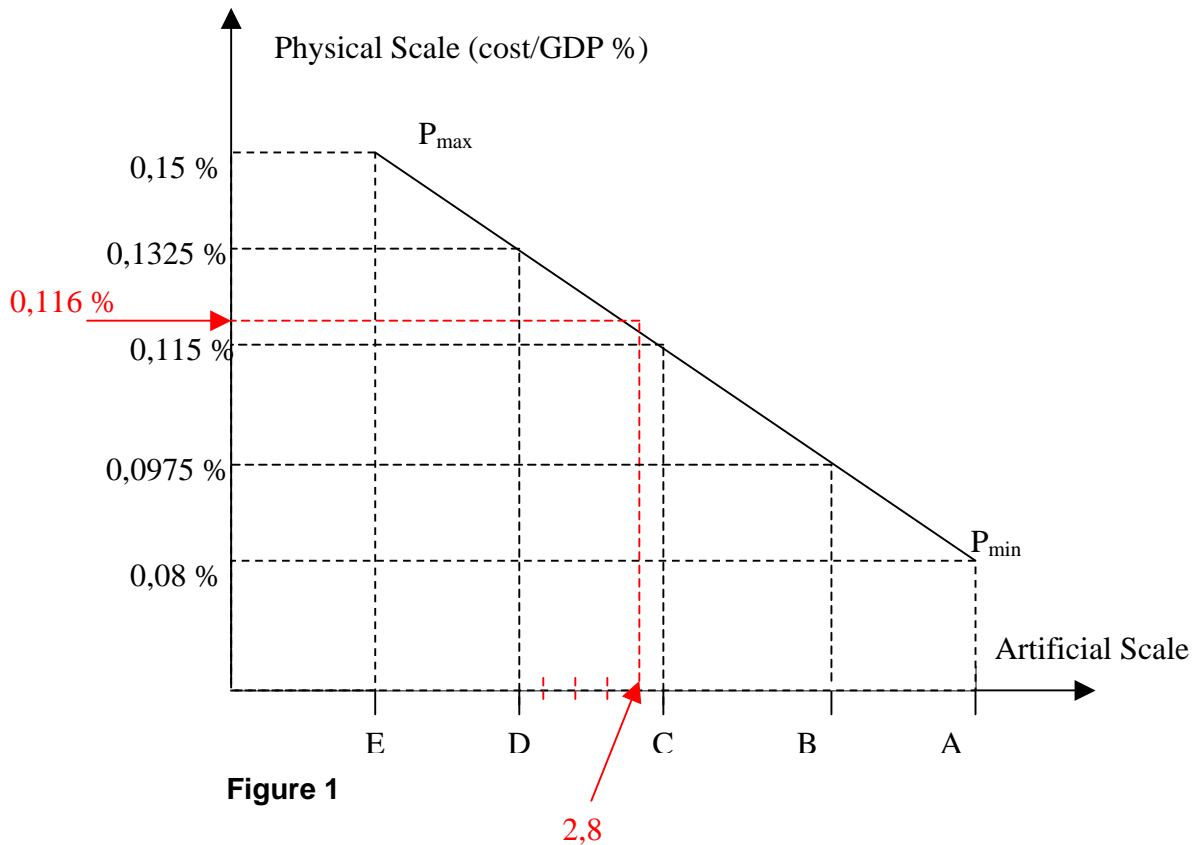


Figure 1

Given the fact that:

$$ED = DC = CB = BA = 1 \text{ and } A=5, B=4, C=3, D=2, E=1$$

If we draw the line  $P_{max}$   $P_{min}$  and then reflect the 0,116 % value on Artificial Scale Axis, criterion's score is calculated almost 2,8.

Therefore the project's relative investment cost can be characterized as **C** or the score of the criterion can be taken directly from the Figure.

4. Level of transport demand

Highways: A: present traffic more than 14000 vpd; B: present traffic from 10000 to 14000 vpd; C: from 6000 to 10000 vpd; D: from 3000 to 6000 vpd; E: less than 3000vpd

Based on the data of section 1, the level of transport demand is 14000vpd, therefore the project's level of transport demand is characterized as **B: present traffic from 10000 to 14000 vpd.**

5. Financing feasibility

A: Excellent, B: Very Good, C: Good, D: Medium, E: Low

In the viability study of the project, and according to expert's opinion, the project's financing feasibility is characterized as **B: Very Good.**

**CLUSTER B - Functionality and coherency of the network (C<sub>B</sub>):**

6. Relative importance of international demand of traffic (passengers)

A: more than 30 % of total traffic; B: from 25 to 30 % of total traffic; C: from 15 to 25 % of total traffic; D: from 7 to 15 % of total traffic; E: less than 7 % of total traffic

Based on the data of section 1, the relative importance of international demand of passenger traffic is 5,2% (=500/9500) therefore the project's relative importance of international demand of passenger traffic is characterized as E: **less than 7 % of total traffic.**

7. Relative importance of international demand of traffic (goods)

A: more than 30 % of total traffic; B: from 25 to 30 % of total traffic; C: from 15 to 25 % of total traffic; D: from 7 to 15 % of total traffic; E: less than 7 % of total traffic

Based on the data of section 1, the relative importance of international demand of freight traffic is 33,33% (=1500/4500) therefore the project's relative importance of international demand of freight traffic is characterized as **A: more than 30 % of total traffic.**

8. Alleviation of bottlenecks

A: Satisfactory, B: Adequate, C: Medium, D: Inadequate, E: Unsatisfactory

Based on expert's opinion the project's alleviation of bottlenecks is characterized as **A: Satisfactory.**

9. Interconnection of existing networks

A: Missing Link, B: Natural Barrier, C: Improve the connection, D: No influence, E: Averse effects on rest of network

Based on expert's opinion the project's interconnection of existing networks is characterized as **A: Missing Link.**

10. Technical interoperability of network

A: No interoperability problems, B: Minimal interoperability problems, C: Tolerable Interoperability problems, D: Serious interoperability problems, E: Unsolvable interoperability problems

Based on expert's opinion the project's technical interoperability in the network is characterized as **A: No interoperability problems.**

**CLUSTER C - Strategic/ Political concerns regarding the network (C<sub>c</sub>)**

11. Border effects

A: No border problems, B: Minimal border problems, C: Tolerable border problems, D: Serious border problems, E: Unsolvable border problems

The project is a one-country one, therefore regarding the border effects is characterized as **A: No border problems.**

12. Political commitment

A: Strong, B: High, C: Medium, D: Adequate, E: Low

The political commitment is characterized as **A: Strong.**

13. Regional and international cooperation

A: Satisfactory, B: Adequate, C: Medium, D: Inadequate, E: Unsatisfactory

The regional cooperation (since there is no international cooperation) is characterized as **A: Satisfactory.**

14. Historical/ heritage/ environmental issues

A: No effects, B: Minimal effects, C: Tolerable/ Reversible effects, D: Serious effects, E: Irreversible effects

According to the Environmental Impacts Study of the project, there are no effects on historical heritage, therefore the project scores **A: No effects.**

15. Economic impact

A: Strong impact, B: High impact, C: Medium impact, D: Low impact, E: No impact

According to the socio-economic study of the project, it is expected to have a **C: Medium Impact.**

**B. Derivation of criteria scores**

According to the quantification of criteria – as described above – the A value is 5 (the highest) in terms of score. Respectively for value E, is 1 (the lowest). The project's criteria scores are presented in **Table 1.**

Therefore:

$$C_{ji} \in [1,5]$$

where:

J = A, B or C and

i = 1, ..., 5

**a. Weighting/ Hierarchy of Criteria**

Having the criteria scores, the evaluation of projects is complete. But in order to proceed with the prioritization of projects criteria weights must be defined.

Country experts agreed with the proposed default set of weights, which is presented in **Table 2.** *The sum of criteria weights is 1.*

**Table 2** Project Criteria Scores (*Greece complete the relevant column*)

Criteria	Scores per Country - involved in the project **																				
	AT	BG	B-H	BL	CZ	CR	FYROM	GE	GR	HU	IT	LT	MD	PL	RO	RU	SK	SL	S-M	TU	UKR
C <sub>A</sub>																					
C <sub>A1</sub>									5												
C <sub>A2</sub>									5												
C <sub>A3</sub>									3												
C <sub>A4</sub>									4												
C <sub>A5</sub>									4												
C <sub>B</sub>																					
C <sub>B1</sub>									1												
C <sub>B2</sub>									5												
C <sub>B3</sub>									5												
C <sub>B4</sub>									5												
C <sub>B5</sub>									5												
C <sub>C</sub>																					
C <sub>C1</sub>									5												
C <sub>C2</sub>									5												
C <sub>C3</sub>									5												
C <sub>C4</sub>									5												
C <sub>C5</sub>									3												

**Table 3 Project Criteria Weights (*Greece agreed with the Proposed Set of Weights*)**

Weights	Default Set of Weight by consultants*	Weights per Country - involved in the project **																				
		AT	BG	B-H	BL	CZ	CR	FYROM	GE	GR	HU	IT	LT	MD	PL	RO	RU	SK	SL	S-M	TU	UKR
$W_A$																						
$W_{A1}$	12%									12%												
$W_{A2}$	4%									4%												
$W_{A3}$	8%									8%												
$W_{A4}$	12%									12%												
$W_{A5}$	4%									4%												
$W_B$																						
$W_{B1}$	10%									10%												
$W_{B2}$	10%									10%												
$W_{B3}$	13%									13%												
$W_{B4}$	10%									10%												
$W_{B5}$	8%									8%												
$W_W$																						
$W_{W1}$	4%									4%												
$W_{W2}$	1%									1%												
$W_{W3}$	3%									3%												
$W_{W4}$	1%									1%												
$W_{W5}$	2%									2%												
<b>SUM</b>	<b>100%</b>																					



### 3. Prioritization (PHASE D of the methodology)

#### 3.1 Projects total score

To derive the project's **total score** per country (in our case is only one country though) we use the following relationship:

$$T.S._{Project} = \sum_{J=A}^C \sum_{i=1}^5 C_{Ji} * W_{Ji}$$

where:

$$\begin{aligned} C_{Ji} &\in [1,5] \\ W_{Ji} &\in [0,1] \\ J &= A, B \text{ or } C \text{ and} \\ i &= 1, \dots, 5 \end{aligned}$$

Therefore:

$TS_{Project/Country} \in [1,5]$  or else the Total Score – for all dimensions together - of each project **in each country** will be the weighted sum of the criteria scores and takes values between 1 (the lowest) and 5 (the highest).

In order to obtain the **Total Score per Project**, we must find a way to integrate the  $TS_{Project/Country}$  for all countries involved in the project. This will be done by using **Country/ Spatial Weights (SW)**.

In our case is only one country so **SW =1** ( $SW_{Country} = \% \text{ of projects length in the country/ total project's length}$ )

So the Total Score of the Project will be:

$$T.S._{Project} = T.S._{Project/Country} * 1$$

The Projects Total Score is  $T.S. = 4,32$  and it is analytically presented in **Table 3**.

#### 3.2 Projects' priorities

The combination of the criterions scores and priorities puts each project in one of the four priority categories.

If the project scores between 4-5 then it belongs to priority category **I**.

If the project scores 3 then it belongs to priority category **II**.

If the project scores 2 then it belongs to priority category **III**.

If the project scores 1 then it belongs to priority category **IV**.

Therefore the project belongs in Priority category **I**: projects, which may be funded and implemented rapidly, including on-going projects up to 2010.

*(The corresponding priority class in Van Mierts' Classification is **Priority A**- Priority project to start before 2010, or which are in the process)*

**Table 4 Project Total Score (Greece complete the relevant column)**

Weights	Scores per Project – from countries involved in the project																				
	AT	BG	B-H	BL	CZ	CR	FYROM	GE	GR	HU	IT	LT	MD	PL	RO	RU	SK	SL	S-M	TU	UKR
TS <sub>A</sub>																					
TS <sub>A1</sub>									0,6												
TS <sub>A2</sub>									0,2												
TS <sub>A3</sub>									0,22												
TS <sub>A4</sub>									0,48												
TS <sub>A5</sub>									0,16												
TS <sub>B</sub>									0												
TS <sub>B1</sub>									0,1												
TS <sub>B2</sub>									0,5												
TS <sub>B3</sub>									0,65												
TS <sub>B4</sub>									0,5												
TS <sub>B5</sub>									0,4												
TS <sub>TS</sub>									0												
TS <sub>TS1</sub>									0,2												
TS <sub>TS2</sub>									0,05												
TS <sub>TS3</sub>									0,15												
TS <sub>TS4</sub>									0,05												
TS <sub>TS5</sub>									0,06												
<b>TS<sub>Country</sub></b>									4,32												
<b>SW<sub>Country</sub></b>									1												
<b>TS</b>	<b>4.32</b>																				

