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A methodological and practical approach to multidisciplinary assessment of the expansion of EU transport network: a strategic case for the republic of Croatia

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Abstract

The paper addresses application of Multi-Criteria Assessment (MCA) methodology to evaluation of transport development options to connect two separated parts of the Republic of Croatia. Selected theoretical and practical aspects of MCA are addressed and efficiency of MCA application to multidisciplinary transport projects is evaluated. Mutual relationships between CBA, traffic modelling, and MCA are discussed.

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1. Background

The land territory of Croatia is separated in two parts by the City of Neum located at the seashore of Adriatic and by a 14 km wide territory of the Bosnia and Herzegovina (B&H). This creates a very complicated and multidimensional challenge to providing continuity of the European Union land territory. The land discontinuity creates problems in communication, transportation, legal aspects which adversely affect regional economies, and complicate achieving long-term EU/Croatia objectives. The situation also touches EU's relationships with a non-EU country (Bosnia and Herzegovina). The provision of territory continuity is definitely consistent with the principles of the EU Cohesion Policy. Several initial transport connections and development options for providing connection were developed by the EU and the Croatian Ministry of Transport (hereinafter: Ministry) (Table 1)

This specific situation calls for consideration of multidisciplinary and multidimensional aspects of project prioritization. For that purpose the multi-criteria assessment approach (MCA) seemed to be the best and likely to provide the most educated and correct answers. Multi-criteria assessment is needed when there are no simple and one discipline type answers. In such circumstances a typical CBA may be misleading and result in false advice and choices. The best C/B ratio solution may be not most advantageous socially, geopolitically, and even economically. A methodology for assessment of the development options was defined together with the Ministry. For this paper, it was assumed that readers have basic comprehension of the MCA methodology. The paper hence concentrated on several selected and most challenging elements of this practical application, and resulting conclusions on enhancing the MCA methodology. This application approach was composed of four major analytical blocks: Cost Benefit Assessment, Multi-criteria Analysis (including all the input assessment), Multidimensional Evaluation, and Interpretation of the Results. A number of steps were undertaken: Final definition of transport infrastructure development options; Assessment of socioeconomic conditions and regional development; Evaluation of existing road infrastructure; Assessment of existing traffic conditions, including the O-D survey results and analysis; Evaluation of technical aspects of development options; Legal assessment. This approach combines standard and fully accepted methodologies of CBA with MCA which sometimes is criticized as a tool representing political interests. This combination may add to the value of the assessment. On the other hand, politics is frequently involved in EUs transport infrastructure decisions. This methodology was applied on practice for finding the best option for transport connection of two parts of Croatia in 2014 and represents mutual methodological agreements between experts, researchers, EC bureaucrats and politicians. The results of this application created a basis for making an investment decision – to build a bridge connecting two parts of Croatia.

Table 1. A List of development transport options for connecting two parts of Croatia.

Option A: Bridge: Mainland – Peljesac peninsula with access roads to the bridge, and:
A1: with a new road across the Peljesac peninsula to the state road D8
A2: without a new road across the Peljesac peninsula to the state road D8
Option B: Neum bypass with connecting roads – city road corridor through B&H with special traffic regime (and status) in the Neum background (city in B&H)
Option C: Highway corridor through B&H with special traffic regime (and status) in the Neum background (city in B&H);
Option D: Long distance ferries with rehabilitation of existing peninsula road (Reconstruction of existing road and partial construction of new road across the Peljesac peninsula from the ferry port Trpanj to the state road D8, using existing ferry connections)
Option E: Short distance ferry line (on position of Pelješac bridge) with connecting roads and:
E1: with a new road across the Peljesac peninsula to the state road D8
E2: without a new road across the Peljesac peninsula to the state road D8
Option F: Immersed tunnel to the Pelješac peninsula with access roads and:
F1: with a new road across the Peljesac peninsula to the state road D8
F2: without a new road across the Peljesac peninsula to the state road D8
Option G: Tunnel under B&H
Option H: Adrian-Ionian Motorway (AIM)

2. MCA for Croatia – initial assumptions

A catalogue of factors which had to be used within MCA for assessment of development options involved: Financial impact (value for-money for development options); Development option long-term sustainability, Impact on economy and environment in target area; Requirements of Schengen Acquis and in particular the Schengen border

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