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PHASED APPROACH TO TRANSPORT INFRASTRUCTURE DEVELOPMENTS

Report of the Meeting on Motorway Stage Construction

Transmitted by the TEM Project Central Office

1. In accordance with the TEM Programme of Work for the year 2002, the TEM Meeting on Motorway Stage Construction was held in Prague on 7 – 8 November 2002. The experts from Austria, Bosnia and Herzegovina, Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia as well as the lecturers from Hungary, Netherlands, United Kingdom and representatives of the TEM Project Central Office (TEM PCO) participated in the meeting.
2. The TEM PCO Project Manager briefly recalled the past activities and results of work of the TEM Project related to the motorway planning, design and construction and underlined the interest of the UN Economic Commission for Europe and its Inland Transport Committee's bodies in the results of the meeting as expressed in the report of the meeting of the Working Party on Transport Trends and Economics held on 2-4 September 2002 in Geneva.
3. The following items were included in the agenda of the meeting:
 - (i) motorway/expressway stage construction decision criteria (e.g. traffic volume – AADT, % of trucks, type of traffic, 30-50th peak hour, induced traffic, forecast period, capacity considerations - level of service required, influence of longitudinal gradient, etc.)
 - (ii) the same as above for one-carriageway longer tunnels or bridges on the full-fledged motorway/expressway

- (iii) stage design of intersections/interchanges
- (iv) concept of earthworks and drainage (stage approach, too or full cross section)
- (v) time space between the first and second stage
- (vi) reduction/total increase of (discounted) construction costs
- (vii) influence of stage construction on the accident rate and additional nuisance during the second stage construction
- (viii) economic evaluation of stage approach (e.g. expressed by the IRR differences)
- (ix) concrete case studies.

4. The presentations of the TEM and non-TEM lecturers were opened by the contribution of Mr. Andras Timar, Senior Lecturer of the Budapest University of Technology and Economics with the presentation on “Economic Evaluation of Staged Transport Infrastructure Projects”. Mr. Hans Nugteren of the Dutch Ministry of Transport, Public Works and Water Management presented his report on “Planning of Road Infrastructure Project”, prepared jointly with Mr. Jos Arts of the same Ministry. Concluding this item of the agenda, Mr. Miles Rendell, Senior Engineer of the Louis Berger Group from United Kingdom, delivered his contribution on “Motorways and Expressways Stage Construction”. Mr. Konrad Schwinghammer from the Austrian Federal Ministry of Transport, Innovation and Technology conveyed the information on his country’s experience in motorway stage construction. This presentation was followed by the presentation of Mr. Igor Jokanovic from the Road Directorate of the Republic of Srpska in Bosnia and Herzegovina. Mr. Stefan Popov, the Head of Department of the Bulgarian Road Executive Agency provided the information on the stage approach chosen for the motorway Kalotina (Yugoslav border) – Sofia and the corresponding economic analysis. His information was followed by the presentation of Ms. Gabriela Ionescu from the Romanian National Administration of Roads, who introduced and explained the Priority Programme for Construction of Motorways and City By-passes and Widening to 4-lane Roads, approved by the Parliament of the country last year. Mr. Peter Barek, Director General of the Road Infrastructure Section of the Slovak Ministry of Transport, Post and Telecommunication, presented the contribution on Motorway D1 - Section Mengusovce - Janovce.

5. Copies of the above-mentioned presentations are available upon request from the TEM PCO or from the secretariat.

6. Following the discussion on the topics related to the different options and approaches to the motorway/expressway stage construction, the participants in the meeting approved its conclusions and recommendations, as presented below.

Conclusions and recommendations

A. General aspects

1. A consistent regional stage construction policy, motorway standards, specifications, etc. should be agreed upon.
2. It is desirable to establish a typical motorway cross-section within the region.

B. Costs/assessment aspects

1. Costs as part of the initial construction package should be agreed to benefit from the economies of scale.
2. Adequate liquidated damages should be included within the conditions of a contract in case intermediate sections are delayed and affect marketability.
3. Whole-life project costs and whole-life benefits should be calculated when assessing/comparing economic efficiency of staged and one-step implementation.
4. As a rule of thumb, motorway staged construction should be considered in all cases where the present (i.e. construction starting year) annual average daily traffic (AADT) volume is less than about 12,000 PCU.
5. Rules of thumb are, nevertheless, questionable because an economic evaluation is highly sensitive to input data (especially costs and traffic).
6. Therefore, a transparent assessment/ranking based on network and scenario related cost benefit or multi-criteria analysis, complemented by sensitivity tests and risk analysis is necessary.

C. Technical aspects

1. Safety of intermediate motorway stages should be ensured.
 2. Adequate right of way and land take at the outset of the project should be ensured.
 3. Structures should be built to final required parameters (height and width).
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