SUSTAINABLE MAINTENANCE OF RURAL ROADS IN SLOVAKIA

Pavement Management System in Slovakia

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Road Network and Road Administrators in Slovakia

• National Highway Company - highways and expressways
• Slovak Road Administration - 1st class roads
• HTU - Self-governing higher territorial units - 2nd and 3rd class roads.
Principles of the PMS:

• Pavement surface performance evaluation
• Design of the repair and maintenance technology
• Economic effectiveness evaluation – using of softwares
Pavement surface performance:

- Bearing capacity - Kuab FWD 50: bearing capacity and residual life of pavement construction
- Roughness - Profilograph GE: - The average longitudinal and transverse unevenness/mean rut depth, IRI
- Surface condition – Videocar: - surface condition expressed by Pavement Serviceability Index,
- Skid resistance: Skiddometer BV 11: - skid resistance measurement
Pavement surface condition
Pavement surface condition
Pavement Management System in Slovakia

PPV - input variable parameters describing the state of the pavement in terms of PV and PS
PV - Operational Performance
PS - Operational Capability
ZZ - Residual Life
HZ - Thickness of Strengthening
ON - Cost of construction work
NSU - Cost of continuous maintenance
UN - User Costs
EN - External Costs
SP - Social Benefits
NPV - Net Present Value
CANUV - Data obtained by measurements on pavement by the CANUV system
KT - Library of Technologies
DP - Transport parameters
DB EN&UN - Database of User and External Costs
PVV - Pavement Surface Characteristics
DF - Degradation Function
EM - Ekonomick Methods
PPV_τ - Variable parameters transformed (output)
Software tools used in Slovakia in PMS

- HDM-4 – Highway development and management System
- C 920 – New section of the roads (variants)
- ISEH (Integrated System of Economic Evaluation) – economic effectiveness of the investments to repair and maintenance works
Program ISEH:

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ISEH – Structure of the user interface

Figure 5: Structure of the user interface

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Outputs of the ISEH:

- NPV – Net Present Value
- PP – Payback Period
- IRR – Internal Rate of Return
- Sequence of the road sections
DEFINITION OF REQUIREMENTS AND EXPECTATIONS OF CUSTOMERS AND OTHER STAKEHOLDERS

• Reliability (safety, durability and usability)
• Quality Management
• Development and environmental protection
QUALITY OF THE ROADS:

The key quality criteria for the road are:

• Safety
• Cruising speed

Level of the road quality is evaluated particularly by the following indicators:

• Transport, construction and technical condition
• Impact on the environment and regional development
BENCHMARKING IN ROAD ADMINISTRATION

The basic principles:

• Selection of the objective quality indicators
• Determine the quality standards
• Make a comparison between road administrator
• Find the reason of the differences
• Eliminate negative factors in top processes
POTENTIAL IMPACTS ON COST INTENSITY

- *Traffic load* - expressed in terms of total intensity or total transport capacity and heavy goods vehicles transport capacity
- *Pavement technical condition* - expressed mainly by the level of technical condition of roads on the basis of surveys conducted by the road administrator and residual life of roads
- *Geographical conditions* - expressed in particular by an average longitudinal inclination of roads
- *Climate conditions* - expressed in particular by an average number of days with significantly adverse weather (icy, freezing, precipitation, snow days)
- *Width arrangements* - expressed as an average road width per administrator.
Conclusions

Sustainable maintenance of roads depends:

- Evaluation and prediction of technical condition of the pavement construction
- Traffic volume prediction and maintenance and repair technology design
- Economic effectiveness of the investments evaluation
- Taking account all relevant circumstances in decision making process
- The main goals: safety and road user satisfaction
- Continue in Research and Development activities
Thank you

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• This contribution is the result of the project implementation: "Independent Research of Civil Engineering Construction for Increase in Construction Elements Effectiveness" (ITMS: 26220220112) supported by the Research & Development Operational Programme funded by the ERDF.

• This contribution is the result of the project implementation: „ Supporting research and development center of excellence for civil engineering” (ITMS: 26220120031) supported by the Research & Development Operational Programme funded by the ERDF.

• „This work was supported by the Slovak Research and Development Agency under the contract No. LPP-0402-09“.

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