

CALCULATION OF INTERNAL DEBT ON ROAD NETWORK IN THE VYSOČINA REGION

Martin Černý¹

¹ Za Prachárnou 10, 586 05 Jihlava, Czech Republic

Abstract

ČERNÝ MARTIN. 2015. Calculation of Internal Debt on Road Network in the Vysočina Region. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 63(4): 1235–1249.

The aim of this paper is to present the issue of financing the extent and quality of the road network, which is a necessary prerequisite for economic and social development of the Vysočina Region. The paper gives a methodological approach to the calculation of internal debt of the road network in the Vysočina Region, made its own calculation in the alternatives, whereas those alternatives reflect financing by the region through its own resources, as well as an alternative, which includes financing and the involvement of external resources (loans, fund state infrastructure and European sources). The calculation determines the size of internal debt, and therefore the extent of the problem. The definition of internal debt we can express as an annual expenditures which has to follow to the road infrastructure to ensure the sustainable quality of road network. The paper describes a potential process ensuring the increase of efficiency of public financing for the road network. In the contribution there is designed a potential solution which deal with dividing regional roads into main three categories and in one of the category to introduce the system of road management.

Keywords: public debt, economic model, financial costs, road infrastructure

INTRODUCTION

Based on the written fact we can mention that Dvořák (2008) dealing with the issue of public budget and debt of public finance. The issue of state budget and fluctuation of tax income is solved by Slaný (2003), which presents that yearly balanced budget of tax income fluctuate according to variations of national income. The expenditures are fixed and it is possible to change it only with difficulties. Fuchs, Tuleja (2003) deal with dividing by methods of rising of deficit deals. Deficit is distinguished into cyclic and structural. The part of deficit which is the result of discretionary measures is called the structural deficit, the part which reflects the development of surplus expenditures over the income during the economic cycle is indicated as a cyclic deficit. The relationship between budget and fiscal policy is described by Hamerníková, Maaytová *et al.* (2007). They have an understanding of the budgetary policy actions which take a place in public budgetary system. The policy is realised by the state and its authorities in different levels. The task of budgetary policy is to insure enough of resources and as well as to make a decision about priorities, i.e. the priority

of concentration of public budget. The budgetary policy relates to the allocation of redistribution of the fiscal state function. The fiscal policy is a part of economic policy and it serves for influence of aggregate demand and aggregate supply with the goal increase demanding and suppresses unwanted effects to price production (GDP), employment and price (inflation). By applying the fiscal policy, the government wants to purposely influence or rather stabilize basic macroeconomic indicators. The main goal of the fiscal policy is to stabilize the function of public budget. Klaus (2002) points out the issues of deficit and its development in time. Peková (2008) deals with the public sector, the function and affectivity of public sector. Erath, Lochl and Axhausen (2008) are focused on development of transport roads in Switzerland. They especially point out the technical parameters, such as labels of centrality and the development of transport intensity. Mu, Walle (2011) present the problem whether the improvement of road infrastructure can mean the improvement of local economy. The article describes factors and development of road infrastructure in rural

area. Pereira and Andraz (2011) are focussed on the investment in road infrastructure in Portugal and its influence on road network in Portugal and its influence on fiscal factors. They introduce an economic model VAR which is meant a simplified model of the production function, input demand and political function. The development of the road network in the short term heavy burden Portuguese budget, and in the long term is problematic with regard to fulfilling of financial criteria of the EU. Zou, Zhang and Song (2008) deal with the correlation between the road infrastructure and the economic growth in provinces of China. The Granger test was conducted in order to prove the dependence of transport and economic growth. Miyata, Hirobata, Shibusawa, Nakanishi (2009) introduce a traffic model whose objective is to reduce the time to transporting. The methodology of demand prediction is based on four traditional steps; the most important is attractiveness of transport route. There are 3 scenarios that are introduced step by step. They include constructing of express ways, interregional connections and the route of ferry. Forslund, Johanson (1995) deal with the assessment of various types of transport connection. According to Vitkanuse, Meidute (2011), the quality of transport in concrete area is possible to asses by means of the method of multi-criterial assessment as it is mentioned by Žvirblis (2005, 2007), Žvirblis, Zinkevičiutė (2008), Žvirblis, Krutkienė, Vitkunas (2008). These methods allow assessing the impact of transport quality by many of criteria. Sadeghi, Kim, Varshosaz (2010) introduce that multi-criterial methods require information about relative importance of criteria. Schomaker, Waid (1992) and Zaperto, Smith, Weistroffer (1997) compared the method of AHP with other 5 methods, which included the methods of use of values. Stewart (2005) deals with hierarchical structuring of various levels and groups of partial elements. Yadollahi, Zin (2011) introduce the concept of Systematic innovation as a practical tool for solving the problem in setting up of the budget of reconstruction. Multi-criterial model for renovation is based on the model TRIZ. Su, Ling, Chiang (2008) report that TRIZ is a system for understanding of the problem and modelling of the contrast and its removing with the use of resources and improving of the system ideality. The calculation of the internal debt is in branch literature missing. The discussion is only among experts in thematic conferences.

Financing of the road network in terms of maintaining the quality and its range is in terms of planning of financial resources in the public sector still an unsolved problem. This is the issue which is closely connected with managerial decision-making and strategic management. The managers make a decision which strategic direction to follow and how they are able to finance in long term. As for public corporation the decision is made by the regional assembly. The Vysočina Region is the owner of 1 630 km roads of II. class and 2 949 km

roads of III. class. All together the region is the owner of 4 579 km roads. The Regional Assembly approves the annual budget of the region. The draft budget is drawn as long-term balanced budget, where incomes of budget are equal to its expenditures. Over the past years it has not been established, apart from the EIB loan, more significant debt. However, it has never been examined from the strategic point of view whether the funds expended to ensure the required quality of infrastructure in the long-term sufficient to ensure consistent quality of the road network. It means that the budget balance can reflect in the long-term in so called internal debt which cause is inadequate long term financing.

GOALS AND METHODS

This paper aims to present the current situation relating to the public debt issues and the Vysočina Region approach to budgeting and responsible budgetary policy. It analyses expenditure in the road infrastructure during the time of the history of the region. It covers the years 2002–2011. These expenditures are expressed in the appendix 1. The determination of the life spans of the road infrastructure is based on comparable analytical data concerning analysis of the condition of the surface of the II. class roads in 2004 and 2007. The level of conditions are in appendix 2. By using this analysis is possible to calculate a lifespan of the roads. Furthermore, the papers deal with the analysis of unit cost prices for modernization of the road network. There were examined data concerning the actual tender prices according to the technological process of surface milling of the roads and laying of a new layer (road surface) in thickness of 5 or 6 cm. It is a technological process, which means ensuring the quality of the surface in the current management of roads. Not considering changes in the trace, relocations, construction of bypass roads, construction of bridges, etc. By the analysis we obtained an average unit price for the modernization of one square meter of the road. The paper describes the economic model for determining the internal debt of the road infrastructure and the minimalist and maximalist version. The minimalist option means that there are considered only its own resources of the organization without other external sources. The maximalist option means that there are counted as own resources, as well as the other external sources. Substituting into the economic model we obtain an alternative calculation that shows how many percent of the surface of the road network is needed to be excluded so that the financing of the required quality and extent was sustainable in the long term. This economic model solves the aspect of expenditure. If there is possible by means of certain measures to strengthen the revenue budget to finance the road infrastructure, then the percentage of the exclusion area of roads out of the road network could be eliminated. However,

this is a matter that relates directly to the legislative changes and the changes to the financial territory governments.

Planning the Vysočina Region's Budget

The Region's budget is put together while observing the Regional Budgeting Policy that is prepared by the Financial Department.

Budget Revenue

Budget revenues are planned based on assumptions that have been made in relevant legislation, in particular the Act on the Budgetary Determination of Tax Revenues and other tax laws. Tax revenues are set as a percentage of the previous year's figures, taking into account the Ministry of Finance's predictions. Additional relevant information that is known during the budget process may also enter into setting the amount. The Regional Authority's departments make an estimate of the expected revenues (administrative fees, revenue from the sale and lease of property, etc.).

Budget Expenditure

Budget expenditures are set by the different departments based on anticipated expenditures and their prioritization. The highest priority includes expenditures that are used as the payment of liabilities incurred in 2012. In terms of transport infrastructure, this mainly includes transport structure construction projects in progress, i.e. those that became legally binding in the previous year based on a resolution adopted by the Region's authority that decided on the expenditure. Another priority covers necessary operating expenditures and mandatory expenditures under the law. With each relevant item of expenditure, the departments also provide reference to the law. The necessary operating expenditures that are associated with the Department of Transport include the cost of operating the Regional Administration and Maintenance of Roads in the Vysočina Region. The third group of expenditures includes the co-financing of projects from other sources, in particular co-financing by the EU. This means the co-financing of road network renovation and modernization projects. The last group consists of expenditures that are intended to prevent emergency (or alarming) conditions, i.e. these expenditures reduce the need for operating expenditures rather than increasing it.

The Region's Position in Relation to Fiscal Policy

With respect to the Czech Republic's Regions, the principal decision-making power rests with the Regional Assembly. The Regional Assembly consists of the representatives of political parties, with the number of the representatives being dependent on the Region's population.

The Region's exclusive competence covers issues that are in the interest of the Region and its residents. The status of the Regional Assembly, other regional authorities and their powers are governed by Act No. 129/2000 Sb., on regions (Regional Government). The Regions manage their own property and have their own budgets.

The Economic Model for Calculating the Internal Debt Within the Road Network

When determining the total financial resources needed to maintain the quality of the road network, it is necessary to have sufficient information about the condition of the roads. The key is to know road defects – five basic categories are set based on the type and scope of road defects. The collection of road defects is governed by the following technical conditions: TP 82 – The catalogue of flexible-road defects (approved by the Ministry of Transport with effect from 1 April 1997) and TP 87 – Designing the maintenance and repair of flexible roads (approved by the Ministry of Transport with effect from 1 February 1997). In determining the financial needs, we will use the source of PavEx Consulting, Ltd. that prepared the 'Measurement of the condition of the surface of the class II and class III road network' for the Vysočina Region. Within the MSHV RoSy PMS system, the collection of defects for the purpose of road surface monitoring is carried out using a "slow moving vehicle" method where data is recorded in a computer.

The data includes information:

- For assessing of type of defects and their total surface in part of similar type and range defects or predictable uniform measures.
- For classification of defects according to TP 87 = allowably failure in dependencies of intensity of transport load.

The quality of the road network is indicated according to a classification in five categories, namely:

- excellent,
- good,
- satisfactory,
- unsatisfactory,
- alarming.

From these 21 samples of tendered prices is possible with using of milling technology and covering new layers thicknesses 5 or 6 cm calculate average unit cost.

Economic Model for Calculation of Internal Debt in Road Network of the Vysočina Region

Changes in the classification of the road network allow us to derive its service life in years. Let Z_i be the service life of road i . Let X_{ij} be the year when road i starts in category j ($j = 1, 2, \dots, 5$), then the service life of the given road is the change in its condition between the 'alarming' and the 'excellent' categories.

Therefore

$$\check{Z}_i = X_{i5} - X_{i1}. \quad (1.1)$$

The average service life of roads \check{z} can be expressed as

$$\check{z} = \frac{\sum_{i=1}^n \check{Z}_i}{n}, \quad (1.2)$$

where n is the number of roads.

Using data analysis is solved the lifespan of road network in the Vysočina Region.

Setting up of lifespan of road network in the Vysočina Region is once of basic parameters for setting up of internal debt V region on the road infrastructure.

From the category changes on the part of road network between years 2004 and 2007 we calculate their lifespan. The lifespan of roads we calculate as average of lifespan on part of roads among each categories. In our case it means the change between years 2004 and 2007. If X_{ij} is frequency of part appearance i category in the year 2004 and j category in the year 2007 and Y_{2007} is category of the year 2007. After that average change of the category Z_i in the years 2004 and 2007 is expressed by

$$Z_i = \frac{\sum X_{ij} Y_{2007}}{\sum X_{ij}}. \quad (1.3)$$

Each road has a certain width that corresponds to the standard for road categorization. Using the width and the total length of a road, we can calculate the total surface area of a road.

If S_i is the width of road i and L_i is the length of road i, than the area of road i Y_i is calculated as

$$Y_i = S_i \cdot L_i. \quad (1.4)$$

The total surface area of all considered roads is

$$Y = Y_{II} + Y_{III}. \quad (1.5)$$

The unit cost for road network replacement can be determined using a sample of designed prices, where C_i is the cost of the mere replacement of road i. The unit cost per square metre for the replacement of road i c_i can then be calculated as

$$c_i = \frac{C_i}{Y_i}. \quad (1.6)$$

The average unit cost \tilde{c} of the replacement of 1 square metre is then

$$\tilde{c} = \frac{\sum_{i=1}^n c_i}{\sum_{i=1}^n Y_i}. \quad (1.7)$$

The total cost K of road network sustainability can then be expressed as

$$K = \tilde{c} \cdot Y. \quad (1.8)$$

Designation to 1.8 we obtain:

The total cost K of road network maintenance must be proportionate to the Region's financial possibilities.

Based on the system of financing through the budgetary determination of taxes, the Region's budgetary possibilities R for road infrastructure can be expressed using budget history. If R_i is the Region's budget for road infrastructure in year i, then

$$R = \sum_{i=1}^n R_i. \quad (1.9)$$

Therefore, the Region's average budgeted expenditure on road infrastructure is:

$$\tilde{R} = \frac{\sum_{i=1}^n R_i}{n}, \quad (1.10)$$

where n is the number of budgeted years.

If we will analyse average year expenditure to the road infrastructure we can step out from resources, which are not for region sure. It includes especially co financing from structural funds, loans and resources from SFTI. The planning period EU 2007–2013 was totally exceptional because using Regional operational programme was distributed huge amount of financial resources to the road infrastructure which is in property of the region. This amount regarding to regulation of European Commission for the period 2014–2020 will not be repeated. Partly European Commission will press to direct connection to TEN-T and amount of assets to main priorities will be expressively lower. From these reason we can from variants of decision making to think that expenditures can be minimalized from direct expenditures only by the region to the variant with including of EU resources.

The Region's total financial possibilities CFM for road infrastructure replacement, excluding external sources, are

$$CFM = \tilde{R} \cdot \tilde{Z}. \quad (1.11)$$

If we will thinking of variant of maximalization with external resources then

$$CFM_{\max} = \tilde{R}_{\max} \cdot \tilde{Z}. \quad (1.12)$$

If we will thinking of variant of minimalization with only internal resources then

$$CFM_{\min} = \tilde{R}_{\min} \cdot \tilde{Z}. \quad (1.13)$$

Assuming that all roads are in the 'alarming' category, we can compare and find out the difference between the total cost K and the Region's total financial possibilities CFM.

If we denote internal debt in road infrastructure V , then

$$|V| = CFM - K, \quad \text{pro } K > CFM \quad (1.14)$$

and express absolut internal debt in road infrastructure for lifespan of road communication.

Internal debt is possible to set up in variants in minimize or maximalize variant.

For minimalization variant reads:

$$|V_{\min}| = CFM_{\max} - K. \quad (1.15)$$

For maximalization variant reads:

$$|V_{\max}| = CFM_{\min} - K. \quad (1.16)$$

The main limitative condition for setting up range of road network is $V = 0$, etc. The region is able to maintain in long time such range of road network that isn't to need additional financing from external resources and increasing of debt.

The number of square metres of road Y_k which is need to displace from road network in base of multi-criterial decision we can set up.

The minimalization variant for excluding of road network $Y_{k\min}$, etc. with external resources

$$|\tilde{c} \cdot Y_{k\min}| = CFM_{\max} - K = CFM_{\max} - (\tilde{c} \cdot Y). \quad (1.17)$$

From this is possible to deduce that minimalization variant (financing by regional budget and external resources) can be expressed:

$$|Y_{k\min}| = \frac{CFM_{\max} - (\tilde{c} \cdot Y)}{\tilde{c}}. \quad (1.18)$$

Accordingly for variant of maximalization (financing only from regional budget):

$$|\tilde{c} \cdot Y_{k\max}| = CFM_{\min} - K = CFM_{\min} - (\tilde{c} \cdot Y), \quad (1.19)$$

$$|Y_{k\max}| = \frac{CFM_{\min} - (\tilde{c} \cdot Y)}{\tilde{c}}. \quad (1.20)$$

RESULTS

If we would like to express the area for excluding from regional road network to ensure rest of roads in the level of excellent for financing only from regional resources, then

$$Y = 28.3345 \text{ km}^2, \quad (1.21)$$

$$Y_{k\max} = 26.6758 \text{ km}^2. \quad (1.22)$$

Excluding in percentage is possible to express P_{\max} :

$$P_{\max} = \frac{Y_{k\max}}{Y} = \frac{26.6758}{28.3345} \cdot 100 = 94.15\%. \quad (1.23)$$

If we would like express by percent area of road infrastructure for excluding from road network to keep rest area of roads in the level of excellent for financing from all resources – regional budget and other resources, then

$$Y = 28.3345 \text{ km}^2, \quad (1.24)$$

$$Y_{k\min} = 18.2599 \text{ km}^2. \quad (1.25)$$

Excluding in procents is possible to express P_{\min} :

$$P_{\min} = \frac{Y_{k\min}}{Y} = \frac{18.2599}{28.3345} \cdot 100 = 64.44\%. \quad (1.26)$$

CONCLUSION AND DISCUSSION

The calculation has confirmed the fact that if Vysočina Region wants to maintain all surfaces in the Vysočina Region at level excellent that the use of own resources must exclude 94.15% of the surface roads of the road network.

The calculation has confirmed the fact that if Vysočina Region wants to maintain all surfaces in the Vysočina Region at level excellent that the use of own and external resources must exclude 64.44% of the surface roads of the road network.

It follows that internal debt is significant and as a measure for ensuring the quality while preserving the functionality of the region is necessary to introduce prioritization of investment in road infrastructure. It is wise to mention that there is the necessity of dividing all roads into 3 categories. The first category includes the roads which can be excluded from the road network. There are the roads which lost the significance for the Vysočina Region. The second category consists of the roads which are the most important roads for the Vysočina Region. This category especially includes the roads with the intensity of more than 1,000 cars and the roads which can be involved in this category by the special significance set up by the experts. In this category there is important to introduce the system of road management. And the last third category includes the rest of the roads, where the maintaining will be based on the political decision (which measure, which road and in which year). This system will be more efficient for increasing the effectiveness of public investment. The system is possible to disseminate into other regions in the Czech Republic. Apart from the introducing the system of maintenance is possible to recommend the change of tax system, for example to fix more income from VAT and consume tax into road expenditures.

Appendix 1

I: Cost for modernization of the road network between the year 2002–2005

District	2002		2003		2004		2005		
	SFTI	Vysočina	SFTI	Vysočina	SFTI	Vysočina	SFTI	Vysočina	EU
Jihlava	0	518	38 176	3 359	99 999	9 444		145 437	4 602
Havlíčkův Brod	8 952	3 558	25 812	8 391	42 952	5 841	4 365	42 635	
Žďár nad Sázavou	68 679	1 714	98 442	6 956	167 468	22 486		110 637	
Pelhřimov	0	0	6 595	6	1 288	6 036		14 767	
Třebíč	11 159	3 446	110 938	479	4 568	3 609	8 296	23 261	4 305
Total	88 790	9 236	279 963	19 191	316 275	47 416	12 661	336 737	8 907

II: Cost for modernization of the road network between the year 2006–2008

District	2006				2007				2008		
	EIB	SFTI	Vysočina	EU	EIB	SFTI	Vysočina	EU	SFTI	Vysočina	EU
Jihlava	25 350		32 666	94 838	74 650		13 074	86 769	17 670	26 211	312 446
Havlíčkův Brod	26 850		20 039	844	73 150		893	44 171	25 408	8 754	4 244
Žďár nad Sázavou	45 550	38 255	16 147		54 450		2 886	4 176	24 658	3 615	52 632
Pelhřimov	20 750		52 184		79 250		15 782	5 308	16 925	4 250	10 091
Třebíč	31 500		12 597	52 152	68 500		3 663	5 544		10 396	3 609
Total	150 000	38 255	133 633	147 834	350 000	0	36 298	145 968	84 661	53 226	383 022

III: Cost for modernization of the road network between the year 2009–2011

District	2009			2010			2011		
	EIB	Vysočina	EU	EIB	Vysočina	EU	EIB	Vysočina	EU
Jihlava		35 075	338 395		12 453	274 164		8 781	153 168
Havlíčkův Brod		7 522	149 566	43 800	46 613	107 868	11 666	59 276	52 853
Žďár nad Sázavou	31 535	8 113	169 634	4 917	19 586	128 601		46 621	17 176
Pelhřimov		12 084	256 426		19 018	122 881		9 662	127 885
Třebíč	15 489	517	466 911		3 609	151 866		25 708	190 545
Total	47 024	63 311	1 380 932	48 717	101 279	785 380	11 666	150 048	541 627

IV: Cost for modernization of the road network between the year 2002–2011

District	Total (2002–2011) (thous. CZK Kč)			
	SFTI	Vysočina	EU	EIB
Jihlava	155 845	287 018	1 264 382	100 000
Havlíčkův Brod	107 489	203 522	359 546	155 466
Žďár nad Sázavou	397 502	238 761	372 219	136 452
Pelhřimov	24 808	133 789	522 591	100 000
Třebíč	134 961	87 285	874 932	115 489
Total	820 605	950 375	3 393 670	607 407
				5 772 057

Appendix 2

The change of road surface of II class between 2004–2007.
 Legend – basic parametres.

District

HAVL – Havlíčkův Brod

JIHL – Jihlava

PELH – Pelhřimov

TREB – Třebíč

ZDAR – Žďár nad Sázavou

Class – number of the class road

Road – number of the road

V: *The change of road surface – from category 1 year 2004 into category 2007*

District	Class	Road	Part of road	Name	From	To	Trafic From	Trafic To	Length	Quality 2007	Quality 2004
HAVL	2	130	1	130.1	0	65	0	65	65	1	1
HAVL	2	130	11	130.11	0	103	21247	21350	103	1	1
HAVL	2	130	13	130.13	0	112	21530	21642	112	1	1
HAVL	2	150	37	150.37	0	352	52492	52844	352	1	4
HAVL	2	150	38	150.38	0	1004	52844	53848	1004	1	4
HAVL	2	150	43	150.43	0	1024	57958	58982	1024	1	4
HAVL	2	150	49	150.49	695	733	79765	79803	38	1	1
HAVL	2	150	49	150.49	733	746	79803	79816	13	1	4
HAVL	2	150	50	150.50	0	24	79816	79840	24	1	3
HAVL	2	340	2	340.2	0	938	1741	2679	938	1	4
HAVL	2	345	2	345.2	1009	2015	1767	2773	1006	1	1
HAVL	2	350	7	350.7	0	378	7988	8366	378	1	5
JIHL	2	348	22	348.22	0	711	28074	28785	711	1	2
JIHL	2	348	25	348.25	0	32	35425	35457	32	1	3
JIHL	2	352	3	352.3	0	25	0	25	25	1	1
JIHL	2	352	6	352.6	0	220	10256	10476	220	1	3
JIHL	2	353	23	353.23	0	579	51396	51975	579	1	1
JIHL	2	353	25	353.25	0	598	53269	53867	598	1	2
JIHL	2	353	29	353.29	0	40	60444	60484	40	1	1
JIHL	2	353	32	353.32	0	18	63243	63261	18	1	2
JIHL	2	353	33	353.33	0	20	63261	63281	20	1	2
JIHL	2	353	34	353.34	0	222	63281	63503	222	1	3
JIHL	2	353	35	353.35	0	28	63503	63531	28	1	2
JIHL	2	353	36	353.36	0	60	63531	63591	60	1	3
JIHL	2	402	3	402.3	0	154	7238	7392	154	1	2
JIHL	2	403	4	403.4	0	1021	7521	8542	1021	1	2
JIHL	2	403	4	403.4	1021	2517	8542	10038	1496	1	2
JIHL	2	403	5	403.5	0	963	10038	11001	963	1	2
JIHL	2	406	1	406.1	0	78	0	78	78	1	1
JIHL	2	406	5	406.5	0	1113	4298	5411	1113	1	4
JIHL	2	406	5	406.5	1113	2203	5411	6501	1090	1	4
JIHL	2	406	6	406.6	0	405	6501	6906	405	1	4
JIHL	2	602	62	602.62	0	23	61715	61738	23	1	3
JIHL	2	602	79	602.79	0	354	81628	81982	354	1	2
JIHL	2	602	80	602.80	0	981	81982	82963	981	1	2
PELH	2	112	40	112.40	0	92	48114	48206	92	1	1
PELH	2	112	44	112.44	0	1354	53118	54472	1354	1	2

District	Class	Road	Part of road	Name	From	To	Trafic From	Trafic To	Length	Quality 2007	Quality 2004
PELH	2	112	45	112.45	0	1780	54472	56252	1780	1	2
PELH	2	112	47	112.47	0	1556	58943	60499	1556	1	3
PELH	2	112	49	112.49	0	222	61401	61623	222	1	1
PELH	2	112	50	112.50	0	1959	61623	63582	1959	1	4
PELH	2	112	51	112.51	0	260	63582	63842	260	1	4
PELH	2	112	53	112.53	0	242	64723	64965	242	1	4
PELH	2	112	62	112.62	0	1979	76985	78964	1979	1	2
PELH	2	128	4	128.4	0	48	8801	8849	48	1	4
PELH	2	128	8	128.8	0	329	15526	15855	329	1	1
PELH	2	128	15	128.15	1886	2292	28085	28491	406	1	2
PELH	2	129	12	129.12	0	354	22912	23266	354	1	4
PELH	2	129	16	129.16	0	1221	27651	28872	1221	1	2
PELH	2	129	18	129.18	0	553	29813	30366	553	1	1
PELH	2	129	21	129.21	0	676	37000	37676	676	1	3
PELH	2	129	22	129.22	0	382	37676	38058	382	1	2
PELH	2	130	30	130.30	0	259	42242	42501	259	1	4
PELH	2	133	4	133.4	0	188	8388	8576	188	1	4
PELH	2	150	19	150.19	0	365	33387	33752	365	1	3
PELH	2	150	20	150.20	0	701	33752	34453	701	1	4
PELH	2	409	7	409.7	0	230	16867	17097	230	1	4
PELH	2	409	18	409.18	8800	9990	45254	46444	1190	1	4
TREB	2	152	21	152.21	0	51	38765	38816	51	1	4
TREB	2	349	12	349.12	0	168	13394	13562	168	1	5
TREB	2	360	73	360.73	0	110	127383	127493	110	1	1
TREB	2	392	18	392.18	0	723	33720	34443	723	1	5
TREB	2	393	1	393.1	0	611	0	611	611	1	1
TREB	2	396	1	396.1	0	75	0	75	75	1	1
TREB	2	399	20	399.20	0	89	29695	29784	89	1	1
TREB	2	408	19	408.19	0	33	35150	35183	33	1	4
TREB	2	360 H	1	360 H.1	0	990	0	990	990	1	1
ZDAR	2	353	22	353.22	0	1110	50286	51396	1110	1	3
ZDAR	2	354	20	354.20	0	33	36591	36624	33	1	3
ZDAR	2	354	30	354.30	0	181	48793	48974	181	1	2
ZDAR	2	360	45	360.45	0	51	89987	90038	51	1	2
ZDAR	2	360	52	360.52	0	414	99363	99777	414	1	5
ZDAR	2	362	10	362.10	0	1009	17337	18346	1009	1	1
ZDAR	2	375	2	375.2	0	763	2596	3359	763	1	1
ZDAR	2	385	6	385.6	0	37	11612	11649	37	1	1
ZDAR	2	387	5	387.5	0	27	8507	8534	27	1	1
ZDAR	2	388	16	388.16	0	674	32459	33133	674	1	1
ZDAR	2	388	25	388.25	0	15	44682	44697	15	1	1
ZDAR	2	602	34	602.34	0	216	30568	30784	216	1	3
ZDAR	2	602	35	602.35	0	75	30784	30859	75	1	1
ZDAR	2	602	39	602.39	0	2259	35664	37923	2259	1	3

VI: The change of road surface – from category 2 year 2004 into category 2007

District	Class	Road	Part of road	Name	From	To	Traffic From	Traffic To	Length	Quality 2007	Quality 2004	District
HAVL	2	130	3	130.3	0	911	976	1887	911	2	2007	2
HAVL	2	130	4	130.4	0	1283	1887	3170	1283	2	2007	2
HAVL	2	130	10	130.10	0	440	20807	21247	440	2	2007	2
HAVL	2	150	47	150.47	0	172	70476	70648	172	2	2007	3
HAVL	2	150	49	150.49	0	695	79070	79765	695	2	2007	3
HAVL	2	345	1	345.1	0	758	0	758	758	2	2007	2
HAVL	2	348	10	348.10	0	876	12153	13029	876	2	2007	4
HAVL	2	350	6	350.6	0	459	7529	7988	459	2	2007	2
HAVL	2	351	1	351.1	7507	8243	7507	8243	736	2	2007	2
JIHL	2	112	71	112.71	0	456	94929	95385	456	2	2007	1
JIHL	2	131	7	131.7	0	150	7675	7825	150	2	2007	1
JIHL	2	134	18	134.18	0	271	31343	31614	271	2	2007	1
JIHL	2	348	16	348.16	0	49	22644	22693	49	2	2007	3
JIHL	2	348	19	348.19	0	836	26696	27532	836	2	2007	2
JIHL	2	348	20	348.20	0	275	27532	27807	275	2	2007	1
JIHL	2	348	26	348.26	2450	2844	37907	38301	394	2	2007	3
JIHL	2	348	27	348.27	0	342	38301	38643	342	2	2007	2
JIHL	2	351	8	351.8	95	213	28116	28234	118	2	2007	1
JIHL	2	351	10	351.10	0	694	28521	29215	694	2	2007	2
JIHL	2	352	2	352.2	0	32	0	32	32	2	2007	1
JIHL	2	352	4	352.4	0	34	0	34	34	2	2007	1
JIHL	2	402	7	402.7	0	1443	18485	19928	1443	2	2007	1
JIHL	2	403	7	403.7	0	292	12536	12828	292	2	2007	4
JIHL	2	406	3	406.3	2235	3075	2313	3153	840	2	2007	4
JIHL	2	406	8	406.8	0	355	11121	11476	355	2	2007	5
JIHL	2	523	1	523.1	0	888	0	888	888	2	2007	1
PELH	2	112	38	112.38	0	114	44859	44973	114	2	2007	1
PELH	2	112	55	112.55	0	165	69120	69285	165	2	2007	1
PELH	2	112	61	112.61	0	658	76327	76985	658	2	2007	2
PELH	2	124	15	124.15	0	1155	29532	30687	1155	2	2007	3
PELH	2	124	15	124.15	1155	2019	30687	31551	864	2	2007	2
PELH	2	128	11	128.11	3860	4420	20869	21429	560	2	2007	2
PELH	2	128	11	128.11	4420	5082	21429	22091	662	2	2007	2
PELH	2	128	13	128.13	0	1288	23621	24909	1288	2	2007	4
PELH	2	128	14	128.14	0	1290	24909	26199	1290	2	2007	4
PELH	2	128	20	128.20	0	329	38308	38637	329	2	2007	3
PELH	2	128	21	128.21	0	262	38637	38899	262	2	2007	2
PELH	2	129	7	129.7	0	479	13955	14434	479	2	2007	2
PELH	2	129	9	129.9	0	46	17239	17285	46	2	2007	2
PELH	2	130	23	130.23	0	510	35520	36030	510	2	2007	2
PELH	2	130	24	130.24	0	159	36030	36189	159	2	2007	2
PELH	2	130	25	130.25	0	79	36189	36268	79	2	2007	2
PELH	2	130	27	130.27	0	846	36979	37825	846	2	2007	4
PELH	2	130	31	130.31	0	361	42501	42862	361	2	2007	3
PELH	2	132	6	132.6	0	94	11121	11215	94	2	2007	2
PELH	2	132	7	132.7	0	117	11215	11332	117	2	2007	1
PELH	2	132	8	132.8	0	417	11332	11749	417	2	2007	2

District	Class	Road	Part of road	Name	From	To	Trafic From	Trafic To	Length	Quality 2007	Quality 2004	District
PELH	2	132	9	132.9	0	764	11749	12513	764	2	2007	2
PELH	2	132	10	132.10	2617	3130	15130	15643	513	2	2007	3
PELH	2	132	12	132.12	0	175	16215	16390	175	2	2007	2
PELH	2	134	9	134.9	0	443	15251	15694	443	2	2007	2
PELH	2	135	35	135.35	0	436	54581	55017	436	2	2007	2
PELH	2	135	35	135.35	436	885	55017	55466	449	2	2007	2
PELH	2	409	15	409.15	0	484	35115	35599	484	2	2007	2
PELH	2	409	16	409.16	0	235	35599	35834	235	2	2007	2
PELH	2	409	17	409.17	0	620	35834	36454	620	2	2007	2
PELH	2	409	25	409.25	55	527	46782	47254	472	2	2007	2
PELH	2	639	4	639.4	0	289	8999	9288	289	2	2007	2
TREB	2	152	20	152.20	0	227	38538	38765	227	2	2007	4
TREB	2	152	25	152.25	0	527	44475	45002	527	2	2007	2
TREB	2	152	37	152.37	0	365	64951	65316	365	2	2007	2
TREB	2	152	38	152.38	0	252	65316	65568	252	2	2007	2
TREB	2	152	53	152.53	0	1030	88097	89127	1030	2	2007	2
TREB	2	349	9	349.9	0	117	9859	9976	117	2	2007	5
TREB	2	351	18	351.18	0	1124	47079	48203	1124	2	2007	2
TREB	2	351	27	351.27	0	23	64330	64353	23	2	2007	1
TREB	2	360	72	360.72	0	768	126615	127383	768	2	2007	2
TREB	2	360	84	360.84	0	343	140755	141098	343	2	2007	2
TREB	2	392	17	392.17	0	206	33514	33720	206	2	2007	2
TREB	2	392	19	392.19	3421	4504	37864	38947	1083	2	2007	2
TREB	2	392	20	392.20	0	353	38947	39300	353	2	2007	2
TREB	2	399	6	399.6	0	800	6114	6914	800	2	2007	5
TREB	2	399	6	399.6	800	1703	6914	7817	903	2	2007	5
TREB	2	399	6	399.6	1703	2255	7817	8369	552	2	2007	5
TREB	2	399	8	399.8	0	398	10130	10528	398	2	2007	5
TREB	2	402	8	402.8	0	1121	19928	21049	1121	2	2007	2
TREB	2	408	17	408.17	0	21	32727	32748	21	2	2007	3
TREB	2	410	23	410.23	0	275	36884	37159	275	2	2007	5
TREB	2	411	7	411.7	0	480	14381	14861	480	2	2007	2
ZDAR	2	349	1	349.1	843	1614	843	1614	771	2	2007	1
ZDAR	2	350	15	350.15	0	751	24326	25077	751	2	2007	2
ZDAR	2	352	12	352.12	0	210	23809	24019	210	2	2007	2
ZDAR	2	353	12	353.12	0	113	20446	20559	113	2	2007	2
ZDAR	2	353	17	353.17	0	331	40660	40991	331	2	2007	4
ZDAR	2	353	19	353.19	0	168	45767	45935	168	2	2007	2
ZDAR	2	354	14	354.14	0	860	24803	25663	860	2	2007	2
ZDAR	2	354	19	354.19	0	682	35909	36591	682	2	2007	1
ZDAR	2	354	32	354.32	0	147	52411	52558	147	2	2007	1
ZDAR	2	357	25	357.25	0	210	49843	50053	210	2	2007	3
ZDAR	2	357	28	357.28	0	378	56101	56479	378	2	2007	1
ZDAR	2	357	31	357.31	0	1348	63387	64735	1348	2	2007	1
ZDAR	2	357	32	357.32	0	167	64735	64902	167	2	2007	1
ZDAR	2	360	37	360.37	0	384	73959	74343	384	2	2007	2
ZDAR	2	360	41	360.41	0	656	84067	84723	656	2	2007	5
ZDAR	2	360	42	360.42	0	345	84723	85068	345	2	2007	5

District	Class	Road	Part of road	Name	From	To	Traffic From	Traffic To	Length	Quality 2007	Quality 2004	District
ZDAR	2	362	11	362.11	0	645	18346	18991	645	2	2007	1
ZDAR	2	387	1	387.1	294	1296	294	1296	1002	2	2007	1
ZDAR	2	387	2	387.2	0	435	5756	6191	435	2	2007	2
ZDAR	2	387	3	387.3	0	1136	6191	7327	1136	2	2007	1
ZDAR	2	387	4	387.4	0	791	7716	8507	791	2	2007	1
ZDAR	2	388	5	388.5	0	404	15489	15893	404	2	2007	2
ZDAR	2	388	17	388.17	0	137	33133	33270	137	2	2007	1
ZDAR	2	388	18	388.18	0	918	33270	34188	918	2	2007	1
ZDAR	2	388	21	388.21	0	1427	34591	36018	1427	2	2007	2

VII: The change of road surface – from category 3 year 2004 into category 2007

District	Class	Road	Part of road	Name	From	To	Traffic From	Traffic To	Length	Quality 2007	Quality 2004	District
HAVL	2	346	5	346.5	0	61	6115	6176	61	3	2007	2
HAVL	2	348	8	348.8	0	46	9599	9645	46	3	2007	3
JIHL	2	112	64	112.64	0	60	81340	81400	60	3	2007	1
JIHL	2	112	67	112.67	0	1376	89005	90381	1376	3	2007	1
JIHL	2	131	6	131.6	337	748	7264	7675	411	3	2007	2
JIHL	2	134	19	134.19	0	184	31614	31798	184	3	2007	2
JIHL	2	348	21	348.21	0	267	27807	28074	267	3	2007	2
JIHL	2	351	9	351.9	0	287	28234	28521	287	3	2007	2
JIHL	2	351	13	351.13	0	92	36130	36222	92	3	2007	2
JIHL	2	403	12	403.12	0	152	22068	22220	152	3	2007	1
JIHL	2	406	9	406.9	0	139	11476	11615	139	3	2007	5
PELH	2	128	2	128.2	0	675	3571	4246	675	3	2007	2
PELH	2	128	10	128.10	0	616	16393	17009	616	3	2007	4
PELH	2	128	22	128.22	0	157	38899	39056	157	3	2007	4
PELH	2	130	26	130.26	0	711	36268	36979	711	3	2007	2
TREB	2	152	28	152.28	0	297	50771	51068	297	3	2007	2
TREB	2	152	30	152.30	0	168	53539	53707	168	3	2007	1
TREB	2	152	48	152.48	0	242	78261	78503	242	3	2007	1
TREB	2	152	52	152.52	0	1082	87015	88097	1082	3	2007	4
TREB	2	392	19	392.19	2563	3421	37006	37864	858	3	2007	3
TREB	2	399	9	399.9	0	376	10528	10904	376	3	2007	4
TREB	2	402	9	402.9	0	127	22540	22667	127	3	2007	2
ZDAR	2	354	9	354.9	0	507	13742	14249	507	3	2007	3
ZDAR	2	354	22	354.22	0	417	38267	38684	417	3	2007	1
ZDAR	2	357	33	357.33	0	919	64902	65821	919	3	2007	3
ZDAR	2	385	4	385.4	0	117	8441	8558	117	3	2007	2
ZDAR	2	387	6	387.6	0	572	8534	9106	572	3	2007	2
ZDAR	2	388	19	388.19	0	109	34188	34297	109	3	2007	1
ZDAR	2	388	20	388.20	0	294	34297	34591	294	3	2007	2

VIII: The change of road surface – from category 4 year 2004 into category 2007

District	Class	Road	Part of road	Name	From	To	Trafic From	Trafic To	Length	Quality 2007	Quality 2004	District
HAVL	2	130	6	130.6	0	651	8688	9339	651	4	2007	2
HAVL	2	130	15	130.15	0	84	23227	23311	84	4	2007	3
HAVL	2	130	18	130.18	0	286	26791	27077	286	4	2007	4
HAVL	2	131	2	131.2	0	380	3894	4274	380	4	2007	5
HAVL	2	150	41	150.41	0	268	56582	56850	268	4	2007	4
HAVL	2	339	21	339.21	0	532	29812	30344	532	4	2007	4
HAVL	2	339	22	339.22	0	783	30344	31127	783	4	2007	5
HAVL	2	339	24	339.24	0	345	34561	34906	345	4	2007	4
HAVL	2	345	3	345.3	0	583	4796	5379	583	4	2007	3
HAVL	2	345	4	345.4	0	416	5379	5795	416	4	2007	3
HAVL	2	345	9	345.9	0	1216	13623	14839	1216	4	2007	4
HAVL	2	348	4	348.4	0	52	5151	5203	52	4	2007	5
HAVL	2	348	6	348.6	0	102	5791	5893	102	4	2007	4
HAVL	2	348	10	348.10	876	1563	13029	13716	687	4	2007	5
HAVL	2	348	12	348.12	0	541	15969	16510	541	4	2007	4
HAVL	2	350	3	350.3	0	842	2859	3701	842	4	2007	4
JIHL	2	131	9	131.9	0	309	10485	10794	309	4	2007	1
JIHL	2	134	13	134.13	0	161	20230	20391	161	4	2007	4
JIHL	2	134	14	134.14	0	1136	20391	21527	1136	4	2007	2
JIHL	2	134	15	134.15	1854	2708	23381	24235	854	4	2007	2
JIHL	2	134	15	134.15	2708	3726	24235	25253	1018	4	2007	5
JIHL	2	348	26	348.26	0	862	35457	36319	862	4	2007	4
JIHL	2	351	15	351.15	3103	3616	42988	43501	513	4	2007	4
JIHL	2	351	16	351.16	0	495	43501	43996	495	4	2007	4
JIHL	2	402	4	402.4	0	921	7392	8313	921	4	2007	2
JIHL	2	404	1	404.1	0	179	0	179	179	4	2007	5
JIHL	2	405	5	405.5	1205	1364	12474	12633	159	4	2007	1
JIHL	2	406	14	406.14	0	270	24477	24747	270	4	2007	2
JIHL	2	406	17	406.17	0	1117	29383	30500	1117	4	2007	4
JIHL	2	409	27	409.27	0	531	51246	51777	531	4	2007	4
JIHL	2	409	28	409.28	0	932	51777	52709	932	4	2007	5
JIHL	2	410	14	410.14	2273	2631	24112	24470	358	4	2007	4
JIHL	2	602	67	602.67	0	50	72899	72949	50	4	2007	2
JIHL	2	602	69	602.69	0	35	0	35	35	4	2007	2
JIHL	2	602	70	602.70	0	150	0	150	150	4	2007	2
JIHL	2	602	71	602.71	0	53	0	53	53	4	2007	2
JIHL	2	602	73	602.73	0	203	0	203	203	4	2007	2
JIHL	2	602	74	602.74	938	1318	73887	74267	380	4	2007	2
JIHL	2	602	76	602.76	0	843	75070	75913	843	4	2007	2
PELH	2	112	58	112.58	0	148	75897	76045	148	4	2007	4
PELH	2	112	59	112.59	0	122	76045	76167	122	4	2007	4
PELH	2	128	3	128.3	2527	3593	6773	7839	1066	4	2007	3
PELH	2	128	3	128.3	3593	4555	7839	8801	962	4	2007	4
PELH	2	128	5	128.5	0	402	8849	9251	402	4	2007	4
PELH	2	128	7	128.7	0	851	12954	13805	851	4	2007	3
PELH	2	128	7	128.7	851	1623	13805	14577	772	4	2007	3
PELH	2	128	9	128.9	0	538	15855	16393	538	4	2007	4

District	Class	Road	Part of road	Name	From	To	Trafic From	Trafic To	Length	Quality 2007	Quality 2004	District
PELH	2	129	4	129.4	2173	3277	6747	7851	1104	4	2007	3
PELH	2	130	34	130.34	0	985	45969	46954	985	4	2007	4
PELH	2	132	11	132.11	0	572	15643	16215	572	4	2007	3
PELH	2	132	14	132.14	0	534	18393	18927	534	4	2007	2
PELH	2	133	3	133.3	0	467	7921	8388	467	4	2007	3
PELH	2	133	6	133.6	0	293	13729	14022	293	4	2007	2
PELH	2	134	8	134.8	0	232	15019	15251	232	4	2007	2
PELH	2	409	12	409.12	0	849	31850	32699	849	4	2007	2
PELH	2	409	19	409.19	0	118	46444	46562	118	4	2007	4
PELH	2	409	25	409.25	0	55	46727	46782	55	4	2007	4
PELH	2	639	1	639.1	0	272	0	272	272	4	2007	3
PELH	2	409 A2	22	409 A2.22	0	55	46727	46782	55	4	2007	4
PELH	2	409 A2	23	409 A2.23	0	84	46672	46756	84	4	2007	4
TREB	2	151	31	151.31	0	349	58996	59345	349	4	2007	5
TREB	2	152	32	152.32	0	961	56600	57561	961	4	2007	2
TREB	2	152	42	152.42	0	812	71522	72334	812	4	2007	4
TREB	2	152	43	152.43	0	186	72334	72520	186	4	2007	3
TREB	2	152	44	152.44	0	1155	72520	73675	1155	4	2007	4
TREB	2	152	47	152.47	0	446	77815	78261	446	4	2007	4
TREB	2	351	23	351.23	0	341	56054	56395	341	4	2007	5
TREB	2	351	37	351.37	0	387	77771	78158	387	4	2007	4
TREB	2	351	38	351.38	3186	3344	81344	81502	158	4	2007	4
TREB	2	360	78	360.78	0	335	132320	132655	335	4	2007	4
TREB	2	360	80	360.80	0	845	134142	134987	845	4	2007	2
TREB	2	392	5	392.5	0	349	9117	9466	349	4	2007	4
TREB	2	392	6	392.6	0	289	9466	9755	289	4	2007	3
TREB	2	392	9	392.9	0	717	13545	14262	717	4	2007	5
TREB	2	399	5	399.5	0	541	5573	6114	541	4	2007	5
TREB	2	399	15	399.15	0	901	16015	16916	901	4	2007	5
TREB	2	401	6	401.6	0	53	10530	10583	53	4	2007	2
TREB	2	402	8	402.8	1121	2225	21049	22153	1104	4	2007	2
TREB	2	408	13	408.13	0	200	26755	26955	200	4	2007	4
TREB	2	408	14	408.14	0	50	26955	27005	50	4	2007	4
TREB	2	410	4	410.4	0	379	5972	6351	379	4	2007	4
TREB	2	410	6	410.6	0	228	9392	9620	228	4	2007	3
TREB	2	410	27	410.27	0	459	42155	42614	459	4	2007	4
TREB	2	411	3	411.3	0	199	3950	4149	199	4	2007	3
ZDAR	2	343	21	343.21	0	421	34030	34451	421	4	2007	3
ZDAR	2	343	22	343.22	0	43	34451	34494	43	4	2007	1
ZDAR	2	348	31	348.31	0	23	44949	44972	23	4	2007	4
ZDAR	2	348	32	348.32	0	29	44972	45001	29	4	2007	4
ZDAR	2	348	33	348.33	0	293	45001	45294	293	4	2007	4
ZDAR	2	348	34	348.34	0	21	45294	45315	21	4	2007	4
ZDAR	2	348	35	348.35	0	220	45315	45535	220	4	2007	4
ZDAR	2	349	2	349.2	0	122	1614	1736	122	4	2007	4
ZDAR	2	349	3	349.3	0	42	1736	1778	42	4	2007	3
ZDAR	2	350	13	350.13	0	970	20800	21770	970	4	2007	4

District	Class	Road	Part of road	Name	From	To	Trafic From	Trafic To	Length	Quality 2007	Quality 2004	District
ZDAR	2	350	19	350.19	0	274	44852	45126	274	4	2007	1
ZDAR	2	350	21	350.21	0	44	47470	47514	44	4	2007	3
ZDAR	2	350	22	350.22	0	27	0	27	27	4	2007	1
ZDAR	2	353	7	353.7	0	716	12406	13122	716	4	2007	4
ZDAR	2	353	9	353.9	0	398	16186	16584	398	4	2007	2
ZDAR	2	354	17	354.17	0	1065	30418	31483	1065	4	2007	4
ZDAR	2	354	17	354.17	1065	1801	31483	32219	736	4	2007	2
ZDAR	2	354	18	354.18	0	382	35527	35909	382	4	2007	3
ZDAR	2	354	25	354.25	0	666	41503	42169	666	4	2007	1
ZDAR	2	354	26	354.26	1859	2205	44028	44374	346	4	2007	1
ZDAR	2	354	29	354.29	0	265	48528	48793	265	4	2007	4
ZDAR	2	357	24	357.24	0	261	49582	49843	261	4	2007	4
ZDAR	2	360	30	360.30	0	662	57666	58328	662	4	2007	3
ZDAR	2	360	32	360.32	0	266	60019	60285	266	4	2007	3
ZDAR	2	360	44	360.44	3024	3525	89486	89987	501	4	2007	2
ZDAR	2	385	7	385.7	0	551	11649	12200	551	4	2007	2
ZDAR	2	385	10	385.10	0	864	17324	18188	864	4	2007	1
ZDAR	2	387	8	387.8	0	1274	11605	12879	1274	4	2007	2
ZDAR	2	388	7	388.7	0	589	17981	18570	589	4	2007	2
ZDAR	2	389	1	389.1	0	77	0	77	77	4	2007	2
ZDAR	2	391	1	391.1	0	539	0	539	539	4	2007	4
ZDAR	2	391	4	391.4	0	164	5710	5874	164	4	2007	5
ZDAR	2	602	47	602.47	0	210	47333	47543	210	4	2007	2
ZDAR	2	602	56	602.56	0	359	53516	53875	359	4	2007	1
ZDAR	2	602	58	602.58	0	724	57449	58173	724	4	2007	2
ZDAR	2	602	59	602.59	0	588	58173	58761	588	4	2007	2
ZDAR	2	602	60	602.60	0	366	58761	59127	366	4	2007	1

REFERENCES

- ČERNÝ, M. 2012. Public debt, Vysočina Region's budget and road network economy. In: *PEFnet*. [CD-ROM]. 1. vyd. Brno: Mendelova Univerzita v Brně.
- DVOŘÁK, P. 2008. *Veřejné finance, fiskální nerovnováha a finanční krize*. Praha: C. H. Beck.
- ERATH, A., LOCHL, M. and AXHAUSEN, K. 2009. Graph-Theoretical Analysis of the Swiss Road and Railway Networks Over Time. *Netw. Spat. Econ.*, 9: 379–400. DOI 10.1007/s11067-008-90747.
- FORSLUND, U. M., JOHANSSON, B. 1995. Assesing road investments: accessibility changes, costbenefit and production effects. *The Annals of Regional Science*, 29: 155–174.
- FUCHS, K., TULEJA, P. 2003. *Základy ekonomie*. 1. vyd. Praha: Ekopress.
- HAMERNÍKOVÁ, B., MAAYTOVÁ, A. et al. 2007. *Veřejné finance*. 3. vyd. Praha: ASPI.
- KLAUS, V. 2002. *Problém českých veřejných financí na počátku nového desetiletí*. Praha: CEP.
- MIYATA, Y., HIROBATA, Y., SHIBUSAWA, H., NAKANISHI, H. 2009. Economy-Transport-Environment Interactive Analysis. A Spatial Modeling Approach. *Studies in Regional Science*, 39(1): 109–130.
- MU, R., WALLE, D. 2011. Rural Roads and Local Market Development in Vietnam. *Journal of Development Studies*, 47(5): 709–734.
- PAVEK CONSULTING, s.r.o. 2004, 2007. *Měření stavu povrchů silniční sítě II. a III. třídy*.
- PEKOVÁ, J. 2008. *Veřejné finance – úvod do problematiky*. 4. vyd. Praha: ASPI, a.s.
- PEREIRA, A., ANDRAZ, J. M. 2011. On the Economic and Fiscal Effects of Investments in Road Infrastructres in Portugal. *International Economic Journal*, 25(3): 465–492.
- SADEGHI, N., KIM, K., VARSHOSAZ, M. 2010. Multi-Criteria Decision-based Model for Road Network. *Process. Int. J. Environ. Res.*, 4(4): 573–582.
- SLANÝ, A. et al. 2003. *Makroekonomická analýza a hospodářská politika*. 1. vyd. Praha: C. H. Beck.
- SU, C., LIN, C., CHIANG, T. 2008. Systematic improvement in service quality through TRIZ methodology: An exploratory study. *Total Quality Management*, 19(3): 223–243.
- VITKANUS, R., MEIDUTE, I. 2011. Multiple Criteria evaluation of the significance of groups of road

- transportation quality factors. *Issue of Business and Law*, 2011(3): 1–10.
- YADOLLAHI, M., ZIN, R. M. 2011. Applied Multi-Criteria Ideal Rehabilitation Model for Budget Allocation Across Road Infrastructure. *International Journal of Innovation Science*, 3(4): 193–202.
- ZOU, W., ZHANG, F., ZHUANG, Z., SONG, H. 2008. Transport Infrastructure, Growth, and Poverty Alleviation. Empirical Analysis of China. *Annals of Economics and Finance*, 9(2): 345–371.

Contact information

Martin Černý: mart.cerny@centrum.cz