Evaluation and Transport Demand Forecasting through Modeling in Anamorava Region

Ramadan Duraku, Vaska Atanasova, Nikola Krstanoski

Abstract— This paper addresses the current situation of traffic demand in the road transport network of Anamorava Region as well as forecasting the future of transport with the aim to develop sustainable transportation and its integration to the main transport network in Kosovo. The main objective is to build a suitable model that fulfills transport demand in the future through modeling in his region. The model is built using main variables like residential, employment, work places and traffic flow data. Macro simulation software VISUM is used, in which after calibration process transport demand forecasting can be used. In modeling transport demand forecasting except variables, different variants as alternative options were taken into consideration in comparison to the current road network version. Evaluation is made by the levels of service, accessibility and reductions of travel times. In this regard, optimal variants were selected. The study is also conducted applying a methodology which includes different methods such as: inductive and deductive, analyse and synthese, history, comparative, maps, simulation method etc.

Index Terms— Transport demand, forecast, modeling, region, PTV Vision VISUM.

1 INTRODUCTION

DUE to increase of population in a single space, the number of trips in the city and within the cities as well as in region or national level is estimated to be increased in the coming years. This is a big challenge to the authority which is responsible for the future of cities, regions and their transport networks from point of view of proper traffic planning and management. In addition, the economic development, growth of the motorized traffic, mobility and demand for passenger and goods transport in many countries has not been followed by necessary transport capacities due to the lack of appropriate investments, and as a result, the transport appears as a barrier for the future development [1].

Transport demand forecasting is a complex and multidimensional phenomenon in one hand, but in the other hand it has became necessary tool for the right orientation to long-term strategies and policies both in terms of space and time horizons [2]. The requirements are to provide clear explanations about the phenomenon and parameters related to the traffic of passengers and goods as well as other factors that have impact on it. It is crucial for the researcher or decision-maker to know the charachteristics of traffic flow in local and national level in order to accomplish analyses or development of a right decision making process, because this facilities presents clear determination of incompliance or unsustainability between current traffic volumes "demand" compared to the road infrastructure capacities "supply".

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1.1 Identification Problem

European integration is Kosovo target, it is a strategic objective and this implies that the system, structures and transport infrastructure respectively road traffic will play a role in facilitating the creation of a commercial space, initially within its territory then in regional and European single trade space [4]. Transport sector plays an important role for economic development of Kosovo and as such is composed of three components: road, railway and air transport [5]. It is assessed that 95% of entire transportation in Kosovo belong to road transportation. Road infrastructure is poor with inadequate maintenance, rehabilitated and constructed [6]. In this regard challenges in this sector present particular topic to be addressed by preparing sector strategies from responsible institutions.

Furthermore, Anamorava Region is not covered by railway transport and other transport mode and as a consequence people of this region are forced to use only road transport [7]. As noted above road transport is the only possibility and for that purpose investments in road infrastructure will have significant impact for economic growth where it will be followed by reduction in transport costs, travel time and environment pollution reduction, increase road safety etc, and connection of this region to the core road network of Kosovo and beyond [8]. In lack of scientific studies there are enough grounds to initiate this scientific study with the aim to build a model for road transport planning in order to reach overall planning of sustainable transport in this region.

1.2 Objective of Research

The aim of this paper is to calculate transport demand using modeling technique as well as its significance on transport forecast and the possibility of integration of this region to the main road transport network of Kosovo and beyond for coming period. The other aim is to analyze current situation of transport demand in one side and road infrastructure in other side from different options from quantity and quality point of views. As a special purpose, which is current situation known as "Do nothing" variant to be amended, supplemented and extended so that it should not remain as standard option, but it should be taken into account all specifics of Anamorava Re-

gion as well as stakeholders interests. In this way, preconditions will be established to give projections of road transport system taking into account its future development.

2 Methodology of Research

2.1 Research Techniques and Procedures

We have conducted this research and analyzed findings using different methods and methodology as described below. Firstly, we have been focused on nature and characteristics of research, then gathering and processing data. There is a need to establish a data base by the variables which has been taken into consideration and counting of traffic flow in order to get a clear picture. This task requires focusing towards variables that have more impact in transport demand forecasting using modeling techniques such as: residential population, employment, workforces in line with the activity of economic branches, traffic flows and software application dedicated in area of transport modeling. The study will rely on classical transport model using macro modeling transport software VISUM [9]. Based on gained figures, transport demand will be conducted and as a result transport model has been established. In addition to this, data collection procedures and methodology application is given in details.

It started with the geographical position of Anamorava Region in Kosovo and its zoning, then by gathering necessary data about variables, charahteristics of road network descriptions in current situations and new development which is planned to happen, with the more attention in traffic flow counts entering/exiting this region at peak hours.

2.2 Geography and Zones

The Anamorava Region is situated in Kosovo valley and from point of view of territorial and organization this is one of the seven regions of Kosovo. Also it counts six municipalities or internal zones: Gjilan, Partesh, Viti, Kllokot, Kamenica and Ranillug with total 166 settlements and 1331 km² [10]. It was necessary to define also outside zones.

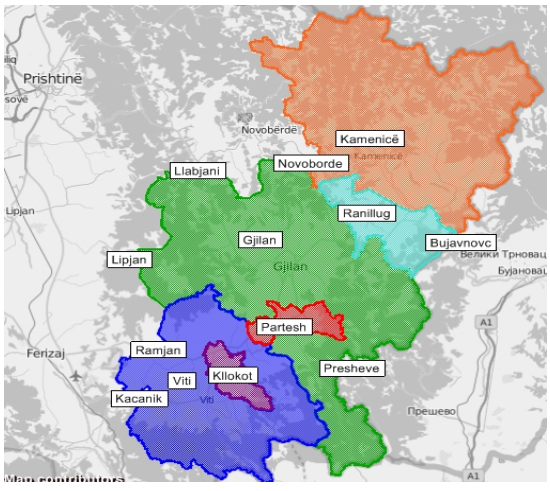


Fig. 1.Internal and External zone of Anamorava Region

There are seven outer zones as external traffic zones that represent enter/exit traffic flow or source and destination of trips in the region such is: 101-Novoberdo, 102-Llabjan, 103-Lipjan, 104-Ramjan, 105-Kacanik, 106-Presheve and 107-Bujanovac.

2.3 Gathering Data of Variables for Transport Planning

Identification of variables for transport planning and modeling using VISUM software is a complex process. Taking into account the importance of these variables, they are taken from the responsible public institutions [11]. All data for these variables are given in a table 1.

TABLE 2
VARIABLES FOR ANAMORAVA REGION IN 2014

No	Variables	Gjilan	Partesh	Viti	Kllokot	Kamenice	Ranillug
1	Resident population	87,385	1,738	47,434	2,709	33,599	3,835
2	Number of employees	16,895	505	5,484	431	5,205	444
3	Number of workplaces by activity	13,251	277	3,461	844	2,989	513
3.1	Administration	1,591	112	428	111	511	130
3.2	Manufacturing + Industry	1,518	5	360	161	283	5
3.3	Education	2,153	83	836	51	848	171
3.4	Recreation	98	0	16	0	9	0
3.5	Business	2,049	11	569	44	325	33
3.6	Services	4,188	28	993	54	795	90
4	Traffic out	613					
5	Traffic enter	537					

2.4 Road Network

The road transport network system is a key element in every transport modeling project and presents a graph which consists of links and nodes. Links are featured by certain elements like length, number of lanes, speed and so on. Also within zones are found centroides as well as connections of centroides [3].

The current road network of this region is classified according to [12], in which the traffic volume is considered like dominant. Thus, according to the traffic flow expressed as annual average daily traffic –AADT and the road network is composed of: roads reserved for motorized traffic, magistral, regional, main, local road and secondary local road as presented in figure 2. Also, when considering variants for the coming years, the other category of roads is included.

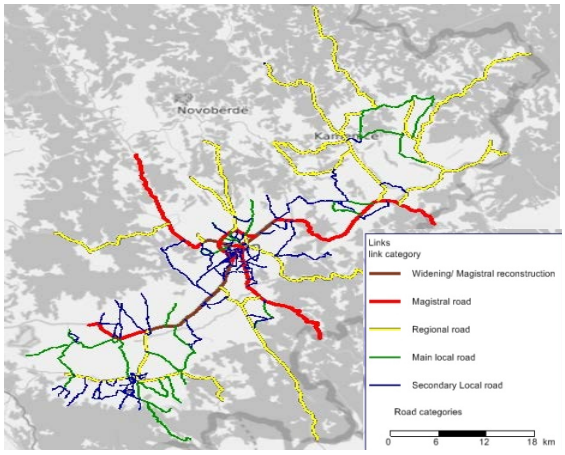


Fig. 2.Current road network in Anamorava region

2.5 Development of New Road Infrastructure

New road infrastructure in this region is planned. Parts of these roads are maintained and reconstructed by extending them which is extra lanes while some of them will be totally reconstructed [13]. In this variant is foreseen to widen traffic lanes in two road segments: Gjilan-Perlepnice with length 1.260 km and Gjilan-Livoc which is part of road segment M25.2 with the length 2.8 km. In addition reconstruction of road segment Gjilan-Kllokot is planned which is part of the national road M25.3 with length 12 km. Road segments that will be widened /reconstructed are presented like a black color in figure 3. It is estimated that this variant will be finalized in 2020.

Fig. 3.New/reconstructed road network in region

In addition to these three segments, construction of new motorway is foressen. This motorway is not presented in figure 3, because the feasibility study is ongoing for two it's options. This project is not foreseen by SEETO [14]. Nevertheless it is worth mention that the project of existing motorway heading to the border of Serbia is foreseen to launch construction by many strategies issued by Government of Kosovo and is in line with [8]. Thus, Government of Kosovo has announced selection of motorway "Prishtina-Bresalc-Gjilan-Dheu i Bardhe" as investment as high strategic priority in Kosovo and in particular for Anamorava Region which is located in South East Transport Network and which will head to Adriatic and northern Albania going through Vermica (border with Albania) in the west of Prishtina and it connects to Dheu i Bardhe with Serbia and Corridor X at North-East, as presented in figure 4. The length of motorway within the territory of Kosovo is L=68 km with two options. Construction of this motorway is considered to establish easy access of this region to other motorways R6 and R7 in the framework of Kosovo road network.

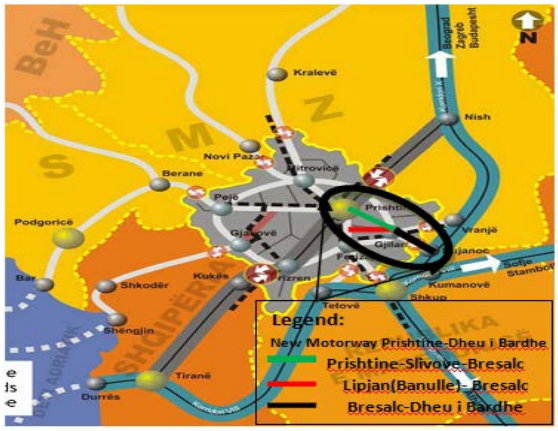


Fig. 4. Short connection of new motorway with corridor X

Congestions near Prishtina will be eliminated connecting this motorway to two other motorways with adequate junction. In this regard this is solution to manage transport demand with two motorways and this is great facilitation to users who aim to travel to the Anamorava region and further. Part of the route from Bresalc to Koncul according to two options is foreseen to be the same distance L=25.729 km, but from Bresalc to Prishtina is foreseen by two options. The first option goes from Bresalc in direction to Banulle (Lipjan) along with the regional road R-209 which connects in the motorway R6 which goes in direction to Skopje with L=20.200 km[15].

The second option starts from Bresalc towards to Llabjan-Slivivo in direction to Prishtina with distance L=26.00 km along with the main road M25.2, which is foreseen to access the outer ring road of Prishtina with the approximately L=5 km. More detailed extension of the route with two options as well as nodes of access is presented in figure 5. This motorway would go through territories of some municipalities inside and outside Anamorava Region. Municipalities which this motorway would go through are Gjilan, Kamencia and Ranillug while outside are Prishtina, Gracanica, Lipjani and Novo-Berdo. Municipalities which the route does not pass through, however goes near them are Viti, Kllokot and Partesh. In case when road network is to be prepared and to establish a model in VISUM software consideration should also taken for two variants and assign road attributes which include speed, number of lanes and its capacity etc. Data on those categories is received from some local and international sources [16], [17].

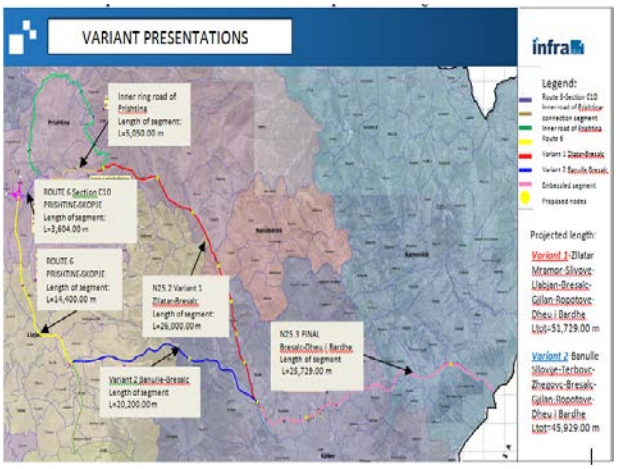
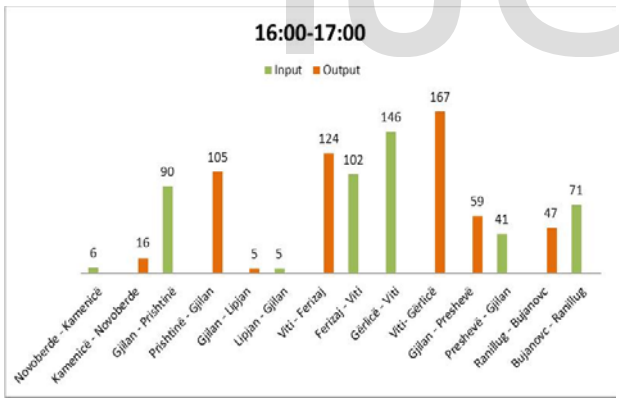


Fig. 5.Presentation of new motorway with two options

2.6 Traffic Counting in Certain Location

We have determined seven locations surrounding Anamorava Region in order to review transport demand, which is necessary to get more information about traffic flow volumes which enter/exit it. The counting of traffic flow was conducted on 15th January 2016 for a peak hour 16:00 -17:00. Counting occurred in the same time in all locations by students of Traffic and Transport Department-University of Prishtina. The counting was made manually recording plates of vehicles in some categories in special designed form for this purpose. The data for traffic flow are presented in graphic 1.



Graphic. 1. Traffic flow entering/exiting for Anamorava Region

In order to establish the transport demand model, it was necessary to define also outer zones which play important role. Also for proper functioning of the model it was needed to create matrix for transiting this territory particularly for passenger and goods vehicles. As we know various categories of vehicles have different influence in traffic flow. Therefore it was needed to convert vehicle per unit in order to have uniform traffic influence. Gained values are multiplied with a coefficient Kk=1.4 to make the equivalent of "Passenger Car Space Equivalent" [18], [26]. Since, counting is conducted on 15th January 2016, during the peak hour, there was necessity to find out AADT as well as nonlinear seasonal and weekly coefficients. Based on data gained from Automatic Traffic Counters-ATC hired from Road Directorate of Kosovo which was placed in four locations AADT and ADT are compared to find monthly nonlinearity coefficient which resulted to be Ks=1.18 [19]. Similarly, it was proceed with calculation and adjustments of weekly nonlinearity, through weekly increasing factor or using weekly nonlinear coefficient which for Friday was Kw=1.01. In this regard, taking into account counted traffic flows and converted for 24 hours, multiplying with the above coefficients we could express them to vehicle per unit or we could determine values of traffic flow which enter/exit in this region [2]. These values can be gained by using equation (1):

$$AADT = \text{Traffic flow} \cdot K_k \cdot K_s \cdot K_w [veh/24] \quad (1)$$

Where : *AADT- Annual Average Daily Traffic; K_k- Passenger Car Space Equivalent;Ks- Seasonal coefficient; K_w- Weekly nonlinear coefficient.*

When generating trips, we were considering six ways to generate trips for all six groups of activities that are embedded in software VISUM. In this case we have taken 6 purposes of trips that could express as follows: n1-home-work, n2-home-school, n3-home-bussiness, n4-home-shoping, n5-home-other and n6-not from home [20]. Factors distribution for trips, for six purposes regarding the parameters "a", "b" and "c" have been taken into account referring [21].

3 Results

After finding all the indicators as mentioned above, it was possible to perform transport demand modeling for this region referring to the current situation. The model is built by software VISUM which is one of the leaders in macro modeling in traffic and transport engineering. Also this model was development by Meta model, which based on four-step classical model [9]. Then by application methodologies and putting all necessary data of variables, it has been made possible to generate results for traffic volumes expressed as AADT, and are presented in figure 6.

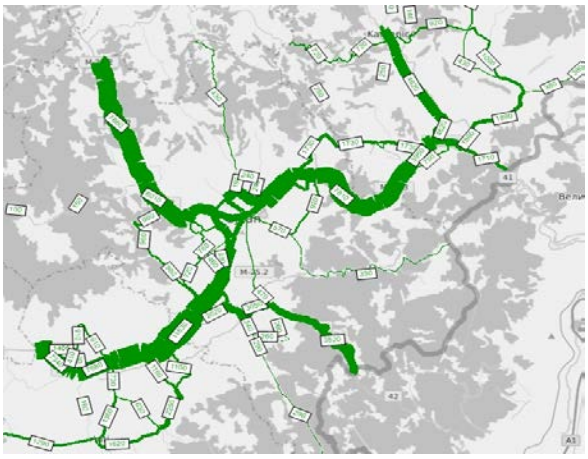


Fig. 6.Transport demand according current situation

In addition in order to use this model for forecasting there was requirement of calibration [22]. The calibration process was made comparing results of ATC traffic flow counting vs. modeled traffic generated by software VISUM which are made by using Root Mean Square Error (RMSE) with equation (2):

$$\%RMSE = \sqrt{\sum (m_i - o_i)^2 / (N-1)} / (\sum (o/N) \qquad 2)$$

Where m_i-is the modeled count; o_i- the observed count and N-is the number modeled/observed data points.

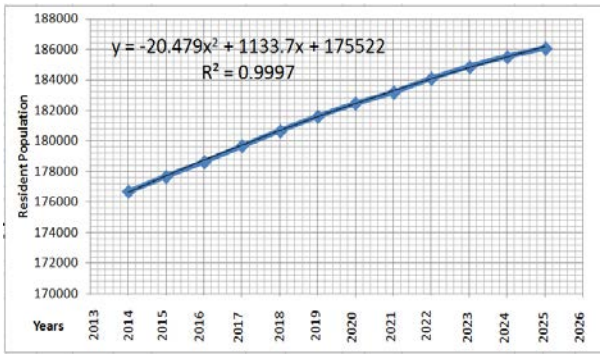
Presentations of comparisons of these results are shown in table 2. The comparison shows that for all main locations where has been ATC counting results are fulfilled under conditions by Root Mean Square Error (RMSE) < 30% and assessed that they are under acceptable level. This ensures us not to do further research and that we may approve this model which can be used for forecasting of transport demand in coming years.

TABLE 2
COMPARISONS RESULTS BY ATC AND VISUM

Location	ATC	VISUM	RMSE
Sojeve	8675	8746	4.47%
Pasjan	3568	3521	
Ranillug	8174	7811	
Slivovo	8268	7856	

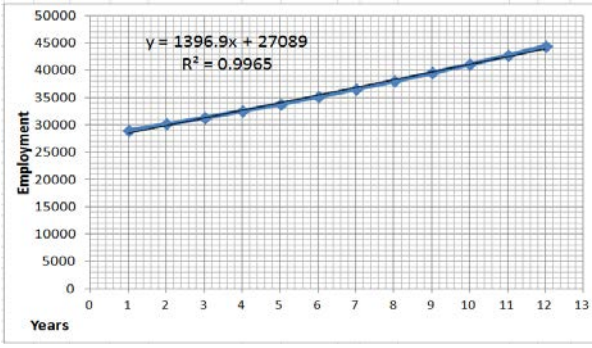
ATC- Automatic Traffic Counters

Taking into consideration future development by the central Government for investment in the road infrastructure in coming years, with the purpose to facilitate traffic between zones and regions also integration of this region into Kosovo road network and beyond we have decided to draft variants on planning and forecasting transport through transport modeling. In total there are four variants such is: "Variant-V0" known variant as "Do nothing", "Variant-V1" which means widening/reconstruction of some segments in main road network, "Variant-V3" and "Variant-V4" by which is anticipated construction of a new motorway according to two options which goes through the territories of some municipalities on this region. In each variant it was made forecasting variables for the reference year 2025 according to the average growth rates for the past years under the medium scenario [23].

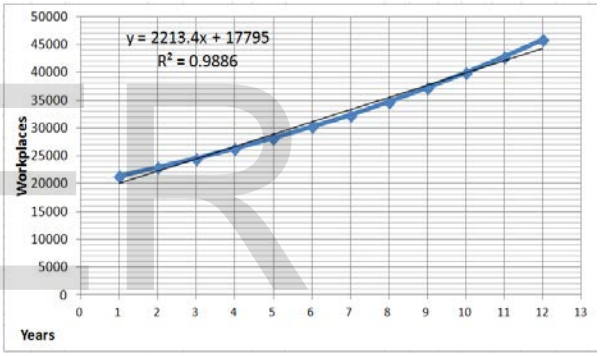


Graphic. 2. Parabolic expression for population forecasting

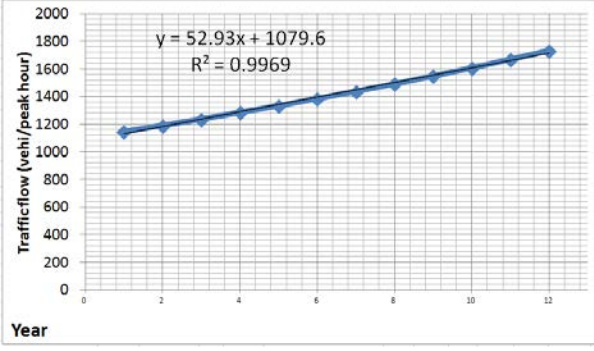
So the average growth rates for these variables in past years have been: 0.51 % for populations, 3.95% for employment, 7.20% for workplaces and 3.80% for traffic flow. These growth are using and also built the regression expressions for variables forecasting as presentes in graphics 2, 3, 4 and 5.



Graphic. 3. Linear expression for employment forecasting



Graphic. 4. Linear expression for workplaces forecasting



Graphic.5. Linear expression for traffic flow forecasting

With intention to figure out the best variant comparison of results is done between variants expressed in values, graphic as well as in percentage. The results of these comparisons are shown in the table 3 and table 4, only for some road segment for which it is considered that are more important, where for each of road category it is taken at least one as a representative

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one.

TABLE 3
COMPARISON DATA BY VARIANTS

Section	Road category	Difference in volumes or %		
		V0-2014	V0-2025	V0-2025/V0-2014
		V/24h	V/24h	%
Zhegoc/Slivovo	M	---	---	---
Ring road Gjilan	M	---	---	---
Kosaqe	M	---	---	---
Bujanovac	M	---	---	---
Shillovo	MRR	8,617	13,618	58
Partesh	MRR	11,831	19,116	62
Slivove	MR	7,856	9,920	26
Ranillug	MR	7,811	12,549	61
Ramjan	MR	8,746	13,294	52
Kacanik	RR	1,290	2,437	90
Medlin Ollbrajt	MUR	3,426	4,880	43
Pasjan	MR	3,521	6,372	81
Topanice	RR	4,821	6,594	37

Legend: V/24 h or % – Volume per 24 hours or percentage. M-motorway, MRR-magistral reconstruction, MR-magistral road, RR-regional road, MUR-magistral urban road.

TABLE 4
COMPARISON DATA BY VARIANTS

Section	Road category	Difference in volume or %		
		V1/V0 2025	V2/V0 2025	V3/V0 2025
		%	V/24h or %	V/24h or %
Zhegoc/Slivovo	M	---	13,849	16,597
Ring road Gjilan	M	---	12,589	12,783
Kosaqe	M	---	14,456	14,750
Bujanovac	M	---	36,93	3,902
Shillovo	MRR	26	-59 (%)	-62 (%)
Partesh	MRR	19	19 (%)	18 (%)
Slivove	MR	20	-66 (%)	-52(%)
Ranillug	MR	18	-70 (%)	-72 (%)
Ramjan	MR	19	19 (%)	19 (%)
Kacanik	RR	19	18 (%)	17 (%)
Medlin Ollbrajt	MUR	36	-27 (%)	-56 (%)
Pasjan	MR	-27	-48 (%)	-41 (%)
Topanice	RR	17	27 (%)	13 (%)

Legend: V/24 h or % – Volume per 24 hours or percentage. M-motorway, MRR-magistral reconstruction, MR-magistral road, RR-regional road, MUR-Magistral urban road.

It can easily be seen by table 3 that making comparisons of the results of variant V0-2014 and variant V0-2025, we have almost increased traffic flow in road network over 50%. While comparisons with the case of the variants V1,V2 and V3-2025 with variant V0-2025, it can be seen that in some road sections decrease of traffic flow over 50% is obvious, but we still have growth in some sections. This happens because of absorption of traffic by the motorway.

4 DISCUSSIONS

After modeling and forecasting of transport demand for the projection year 2025 in line with four variants and with approved medium scenario as well as analysis through comparing them with basic variant V0-2014, we conclude that is not enough to perform assessments in order to know which are the best variants. In each variants we have done firstly forecasting of mentioned variables according to medium scenario. Based on them transport modeling and forecasting until 2025 are done using VISUM software which has capability for giving results through interface in graphic and analytical way[9]. Due to the lack of possibility to establish the best model only based of data for traffic flow, our research is extended applying the methodology "Performance analysis and differential comparisons". In order to make detailed analysis Level of services, accessibility through isochrones and reduction travel times are included, where it was made possible to compare results between variants according to aforementioned methodologies. It is obvious there are positive results in terms of three variants with investments compared to basic variant in regard to travel time. It is worth mention that according to Level of services methodology, the majority of road network according to the current variant will soon exceed road capacity by reaching the level of service E. This level of service is valid for the most of main roads in 2014 year while the level of service F will be reached in 2025 as presented in figure 7 [24].

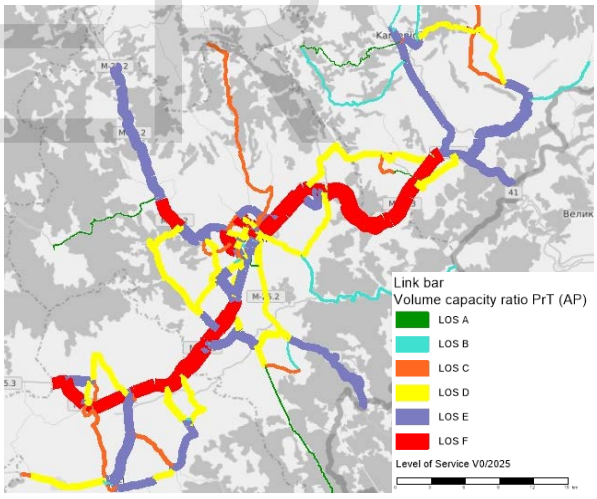

Fig. 7. Level of services according to variant V0-2025

It was also clear that application of variants of investments according to level of service, this situation will be improved significantly in particular by application of variant V2 or V3, expect in some road sections in which specific project interventions are necessary. According to accessibility methodology through isochrones [25], more favorable zones situated near the road network in which investments will be undertaken and which are mainly zones near future motorway and less favorable are zones which situated in the periphery of the region [6]. The figure 8 show that interventions in the road network according to variants V1,V2 and V3 will make better accessibility between zones within Anamorava Region.

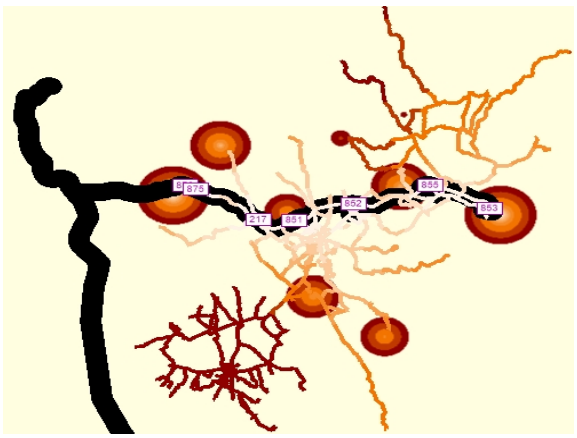

Fig.8. Isochrones > 50 min over accessibility according to variant V2-2025.

Zones that still remain with poor accessibility or with more than 50 minutes regardless investments in the road network are Vitia, Kllokot and peripheral area of Kamenica. It is clear that by application of interventions and investments in the road infrastructure we will get better accessibility and will bring zones closer to each other from point of view of time. Nevertheless these analyses are not enough to make selection of the best variant which would be the best way to see differences. For sake of this, we have extended our research towards use of "reductions travel time" parameter which is the possibility provided by Visum software [9]. Also the volume-delay function (VDF) is defined for links. VISUM software offer different of VDF functions, which differ by forms and parameters and may be calculated by using equation (3):

$$t_{cur} = t_0 \cdot (1 + a \cdot sat^b) \qquad (3)$$

Where: sat=q/q_{max}; t_0-free flow travel time (s); q-traffic volume (vehicle units/time interval; q_{max}-capacity (vehicle units/time interval); t_{cur}-travel time in loaded network (s); a, b and c are parameters [21].

TABLE 5
COMPARISON RESULT BY TRAVEL TIME REDUCTIONS

		Difference V1 vs. V0 for year 2025			
No	Zones	Before	After	Difference in time	Difference in %
1	Gjilan	124.2	120.7	-3.4	2.8
2	Viti	203.4	197.1	-6.3	3.1
3	Kamenice	266.7	262.0	-4.7	1.8
4	Kllokot	179.3	173.0	-6.3	3.5
5	Ranilluk	194.4	189.7	-4.7	2.4
6	Partesh	153.6	150.6	-3.0	1.9
101	Novoberd	335.8	331.1	-4.7	1.4
102	Llabjan	241.6	236.7	-4.9	2.0
103	Lipjan	288.5	283.6	-4.9	1.7
104	Ramjan	207.6	201.4	-6.3	3.0
105	Kacanik	262.1	255.8	-6.3	2.4
106	Presheve	239.2	236.1	-3.0	1.3
107	Bujanoc	239.4	234.7	-4.7	2.0
	Average	225.8	221.0	-4.9	2.2

After comparing the results by tables 5, 6 and 7 it was clear there is increase of percentage in favor of reduction of travel times for each zone covered by the study.

TABLE 6
COMPARISON RESULT BY TRAVEL TIME REDUCTIONS

		Difference V2 vs. V0 for year 2025			
No	Zones	Before	After	Difference in time	Difference in %
1	Gjilan	132.5	127.3	-5.2	3.9
2	Viti	187.4	165.2	-22.3	11.9
3	Kamenice	227.2	183.0	-44.2	19.4
4	Kllokot	163.4	141.1	-22.3	13.6
5	Ranilluk	181.6	164.1	-17.5	9.6
6	Partesh	137.8	119.0	-18.8	13.6
101	Novoberde	296.4	252.2	-44.1	14.9
102	Llabjan	213.8	181.0	-32.7	15.3
103	Lipjan	204.6	115.7	-88.9	43.4
104	Ramjan	191.7	169.4	-22.3	11.6
105	Kacanik	246.1	223.8	-22.3	9.0
106	Presheve	223.7	205.3	-18.5	8.2
107	Bujanoc	201.2	158.4	-42.9	-21.3
	Average	200.5	169.7	-30.9	15.1

TABLE 7
COMPARISON RESULT BY TRAVEL TIME REDUCTIONS

		Difference V3 vs. V0 for year 2025			
No	Zones	Before	After	Difference in time	Difference in %
1	Gjilan	134.5	131.3	-3.1	2.3
2	Viti	193.5	177.2	-16.2	8.4
3	Kamenice	240.4	209.4	-31.0	12.9
4	Kllokot	169.4	153.2	-16.2	9.6
5	Ranilluk	188.1	177.1	-10.9	5.8
6	Partesh	143.9	131.1	-12.7	8.9
101	Novoberde	309.5	278.6	-31.0	10.0
102	Llabjan	213.0	179.6	-33.5	15.7
103	Lipjan	267.1	240.9	-26.3	9.8
104	Ramjan	197.7	181.5	-16.2	8.2
105	Kacanik	252.1	235.9	-16.2	6.4
106	Presheve	230.3	218.3	-11.9	5.2
107	Bujanoc	207.4	170.7	-36.7	17.7
	Average	211.3	191.1	-20.2	9.3

Overall, the network improvements show good utilizations rates, which contribute in reduction of travel times and increasing accessibility. From of point of view of traffic flow all three variants are better by comparing reduction travel times on the road network of Anamorava Region by VISUM software we get better picture on listing variants as per priorities. From point of view of percentage in reduction travel times the most favorable is variant V2 by 15.1%, next is variant V3 by 9.3 % and according to variant V1 by 2.2%. In this way of variants as per their priorities is as follows V2→V3→V1.

5 CONCLUSIONS

Several important conclusions arise in handling this paper and this relate to assesment and forecasting of transport demand through modelling for Anamorava Region and the possibility for better integration of it into Kosovo road network . Also some point of views is issued on investment in transport infrastructure mainly as regards motorways which have many dimensions such is political, economic and social aspects. Benefits from construction of motorways are many in a long term such is inernational, regional, national and local level.

After completion of this study we ascertained that targets set in advance are achieved. In this regard we may present conclusions as follow:

- Through engineering methods and use of PTV VISUM software, modelling and forecasting of transport demand is done for initial year 2014 and for perspective year 2025 according to variants proposed for improvement and investment intervention in the main road network,
- Features and analysis of the main road network for Anamorava Region is done through PTV VISUM like level of services, accessibility and reduction travel times between zones of this region making in this way comparison and establishing priorities for selection of the best variant,
- Variables are identified and forecasts which have the biggest impact in forecasting transport demand as well as institutions from which we would collect data establishing in this way a database which will be used in the future for studies of this nature and also to be used by transport planners and modellers,
- Establishment of macro model useful for forecasting of transport demand, respectively planning of traffic flow in Anamorava Region which we consider it can be used as a reference by competent institutions in central, regional and local level.

ACKNOWLEDGMENT

I wish to thank student of FIM-Traffic and Transport Department-University of Prishtina. Also i want to thank coauthors regarding advices and suggestions for this paper. This work was not supported by a grant.

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