

Model for Short – Term Forecast on Vehicles in Bitola Town

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Abstract: The contemporary lifestyle leads to rapid increase of number of motorized traffic participants thus, there is a need of traffic planning, which requires forecast. Considering the fact that contemporary software packages exist, based on modern technology and long - term experience it is decided to rely on the software package PTV Vision – VISUM, for forecast in the traffic in Bitola town. Synthetic model is designed by this software package, modeling is done on existing situation, model's calibration and in this article output results are presented from forecast on vehicles in Bitola town, for next 5 years.

Key words: Model, forecast, Bitola.

1. Introduction

Traffic planning is a specific process that determines the capacity to satisfy the transportation needs in the future of a pre-defined space. The traffic forecast will be described in this paper for the Bitola town. Considering the fact that contemporary software packages exist, based on modern technology and long - term experience it is decided to rely on the software package PTV Vision – VISUM, for forecast in the traffic in Bitola town [1]. With this software package, modeling is done on existing situation, model's calibration and forecast on vehicles in Bitola town, for next 5 years.

First data collection is done for the purposes of traffic planning. Synthetic model is designed by this software package whereas input data are used values performed by counting the traffic at selected intersections in Bitola town.

Model's calibration is done in VISUM, with Projection of routes, tool. Thus simultaneously, testing of results and comparison of numbered model sizes (dimensions) is done and for the same will be presented cooperative view.

Based on the created synthetic model, the resulting O-D matrix, corrections are made and obtained predictions for the size of flows of thoroughfares in Bitola, for next 5 years, individually for the flows of PC.

2. Data Collection for Traffic Planning in Bitola Town

2.1 Zoning of the City of Bitola

Zones are objects which describe areas with a particular land use and their location within the network (e.g. residential areas, commercial areas, shopping centres, schools). They are origin and destination of trips within the transport network.

Zoning is the process of determining and drawing the zones of a city.

Metropolitan municipality of Bitola was divided on 13 major areas that are functionally separate - compact enclosures that are mutually distinguished by certain city streets. On the other hand, they behave and act as a core - called the city of Bitola [2, 3].

2.2 Kordon Counting

On February 18 2011 (Friday) at the time 2:00 to

3:00 pm, was made cordon counting of vehicles.

The goal of research is to provide assessment of the accumulation of vehicles, and purpose of the survey is to give estimates on the number and structure of transit vehicles through the territory of Bitola town.

Cordon implies notional boundary line around the city of Bitola, and counting of vehicles was carried out on all roads that intersect kordon line.

The accumulation of vehicles on kordon line is determined by summing the total number of vehicles entering and leaving the space in a given period, with Counting results are given in Table 1.

2.3 Counting on Intersections

Counting on selected intersection in Bitola town was done on October 29, 2010 during the period of 7:00 a.m. until 9:00 p.m., 290 counters were included in two shifts.

Data from 38 intersections were analyzed, rush hour was determined and these values were used as input values in the model.

Values were written by “Turns” tool and then by the help of software flows of links were received.

3. Modeling of Transport Demand

Modeling is done on existing situation, model’s calibration and forecast on vehicles in Bitola town and synthetic model is designed by software package PTV Vision-VISUM [4-6].

Fig. 1 represents nodes and links of the network in the area where research is done. Accordingly, each link was added to the section capacity and vehicles speed. With red color are shown roads with a speed of 50 km/h, with green color are shown roads with a speed of 40 km/h and with blue color are shown roads with a speed of 30 km/h.

3.1 Modeling on Existing Situation

3.1.1 Zoning of the Main Zones

Metropolitan municipality of Bitola was divided on 13 major areas that are functionally separate - compact

Table 1 Results of cordon counting.

	Greece-Prilep	Greece-Ohrid	Ohrid-Prilep	Ohrid-Greece	Prilep-Ohrid	Prilep-Greece
Car	8	4	2	8	5	9
Bus	1	1	0	0	0	3
Track	1	0	1	0	1	2

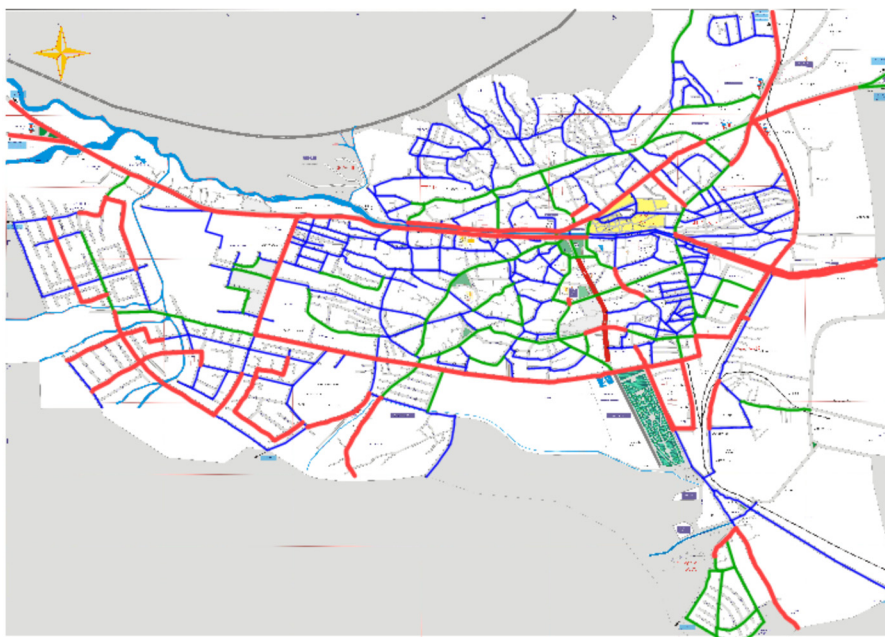


Fig.1 Graphic display of roads network with different speed.

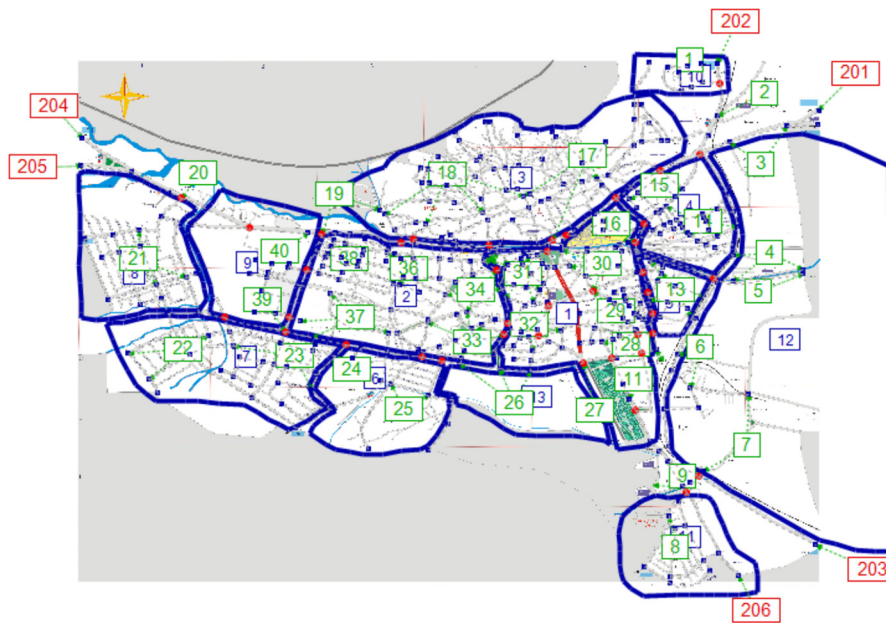


Fig. 2 Separation of the major areas in zones.

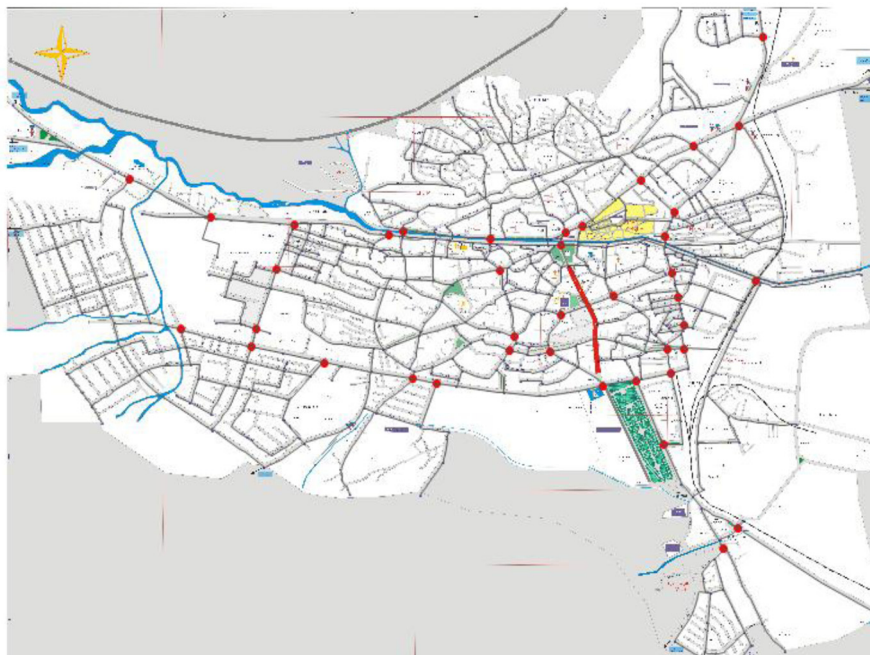


Fig. 3 Intersections counting in the area where research is done.

enclosures that are mutually distinguished by certain city streets. On the other hand, they behave and act as a core - called the city of Bitola.

For the purposes of the model is further zoning done. The main area includes a different number of zones, so there are 46 zones. Fig. 2 represented the main zones (total 13) with blue, zones (total 40) with green and

zones outside the city (6 in total) with red color.

3.2 Choosing a Model Forecast of Transport Demand

The formulation of the model depends on the initial sizes and input variables that will encompass. The basic definition is that the model should have the ability to "reflect" the appearance that simulates.



Fig. 6 Counted and modal values for cars - existing situation.

4. Forecast of Transport Demand

4.1 Forecast for Existing Situation

Forecast is scientific prediction of some phenomena that are of great importance to human society. Based on created synthetic model, the resulting O-D matrix, corrections are made and forecast on vehicles in Bitola town, for next 5 years.

In the process of forecast the increase of 2% annually is taken into account. For main zone 13 (Barracks in Bitola), i.e. the zones 26 and 27, taking into account the

DUP (detailed urban plan) in this part of town. Taken a balanced growth of 5% annually - for the first 2 years and 3% annually - for the next 3 years.

Illustrative, in particular section would look like this: The section between the two junctions Partizanska - Ivo Lola Ribar and Partizanska –Kliment Ohridski, are counted 635 vehicles, while the model gives us the value of 666 vehicles. The projected forecast for 5 years, obtained 739 vehicles.

On Fig. 8 counted values are represented by green, and red-values obtained model sizes.



Fig. 7 Forecast on vehicles in Bitola town, for next 5 years.



Fig. 8 An illustrated example for the section Partizanska - Ivo Lola Ribar and Partizanska –Vasko Karangelevski.

5. Conclusion

The forecast has always been a big challenge for scientist who conduct research in the field of future prediction and for others. The forecast is a prediction of some scientific phenomena that are of great importance to human society. Using the software package PTV Vision – VISUM we made forecast on vehicles in Bitola town, for next 5 years, based on a lot of input data, we got investigation outreach and data collection. We made comparative analyses of counted, modal and forecasted values. From output results can conclude that have an acceptable deviation of modals values from counted values that mean suitability for modal's usage.

References

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