

STUDY ON THE OPPORTUNITY TO DEVELOP AN UNITARY TRANSPORT SYSTEM WITHIN PITESTI-MIOVENI AREA

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Abstract: Based on the latest studies on public transport at the level of Pitesti city and suburban area, and considering the economic evolution of the Pitesti - Mioveni area, there have been identified the opportunities to develop an unitary transport system in this area by capitalizing effectively the existing transport infrastructure. In the new transport system there will be found various modes of transport, developed based on the studies proposed to be done.

Keywords: transport demand, infrastructure, transport mode, Origin-Destination (OD) diagram.

1. EVALUATION OF THE TRANSPORT DEMAND

Development of a public transport system is done based on the transport demand, defined by the size and direction of travel hourly flows at different times of the year.

In this sense, for the modernization of the public transport it was organized a sociological survey, questioning the residents of Pitesti city on public transport and it has been defined (based on the principle of inference) the demand for transport.

The sociological questionnaires were distributed within the ten residential areas of the Pitesti city, proportionally to their population - Fig. 1.

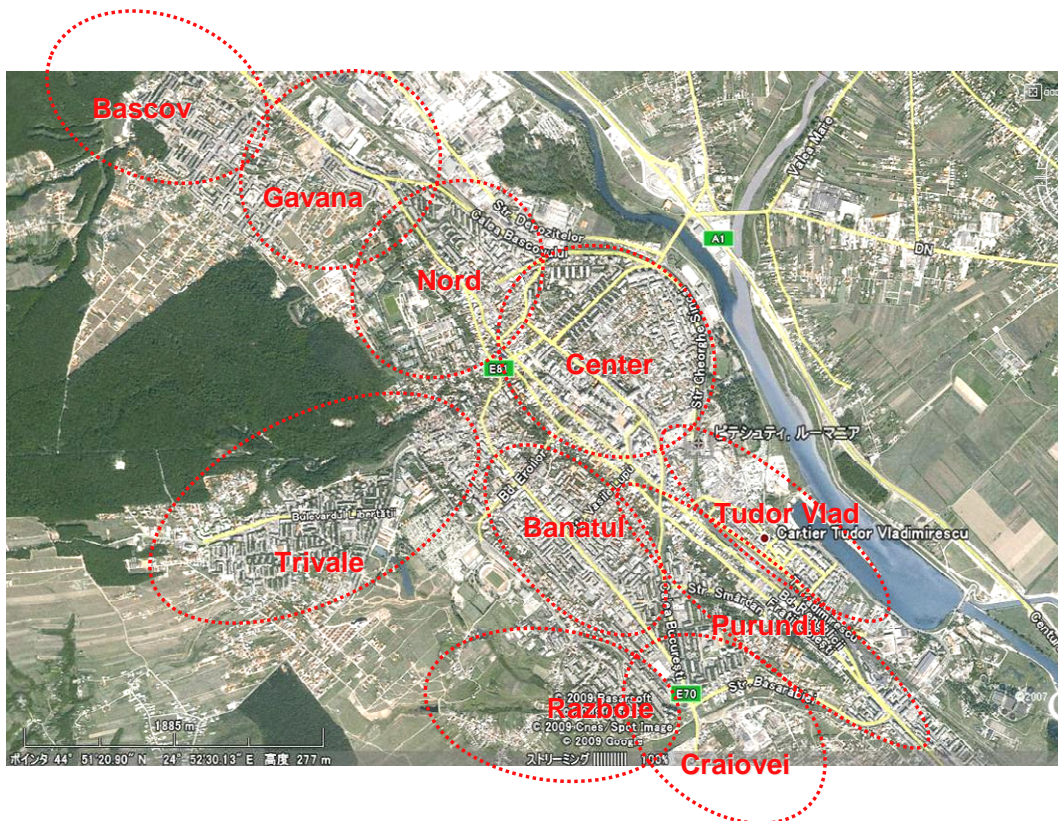


Fig. 1. The ten residential areas of the Pitesti city.

Allocating the evaluated transport demand (the "Origin-Destination" O-D matrix) on the existed transportation network, it was obtained the so-called "Spider diagram" that reveals the transportation network loading in a working day, and the possibilities of optimizing it in order to increase the efficiency of the public transport (Fig. 2).

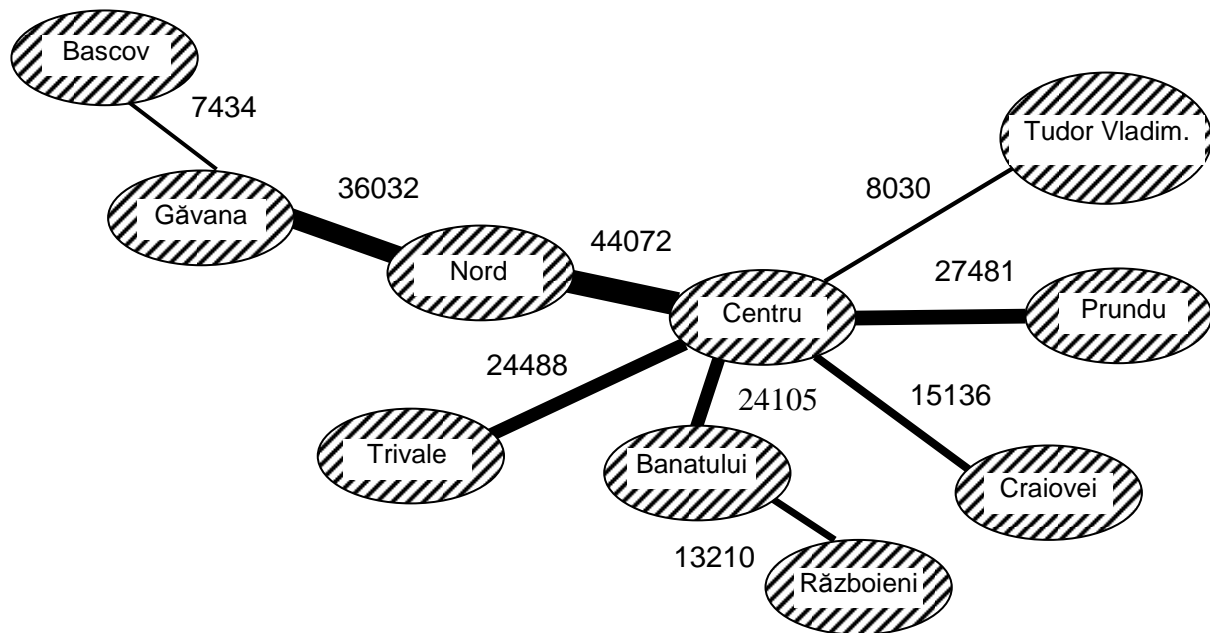


Fig. 2. The Spider diagram for the public transport within Pitesti city.

The Pitesti city is a town with a longitudinal arrangement, along Arges river, and this is the reason that, even it has a small area of 40.73 square km, the average travel distance (d_{med}) has a value that justify the option of the residents for public transport:

$$d_{med} = \frac{M}{P} = \frac{\sum_{i=1}^{10} d_i \cdot P_i}{P} = 2,71 \text{ km} \quad (1)$$

with:

- M – transport momentum;
- d_i – the average distance up to downtown;
- P_i – population of the area;
- P – total population.

Table 1. The elements of the Spider diagram.

Area	d_i [km]	P_i [loc.]
CENTRU	1	20346
NORD	2	12337
GAVANA	4	37145
CRAIOVEI	3	15962
RAZBOIENI	3	14857
BANAT	2	16741
TUDOR VLADIM.	4	6282
PRUNDU	4	16867
TRIVALE	4	27050
BASCOV	5	871
TOTAL		168458

The studies on the transport demand on the route Pitesti - Mioveni revealed that the passenger flow is permanent and is very high (almost 2000 passenger / day - Fig. 3), which justify the targeting research to develop a rapid public transport line between Pitesti and Mioveni.

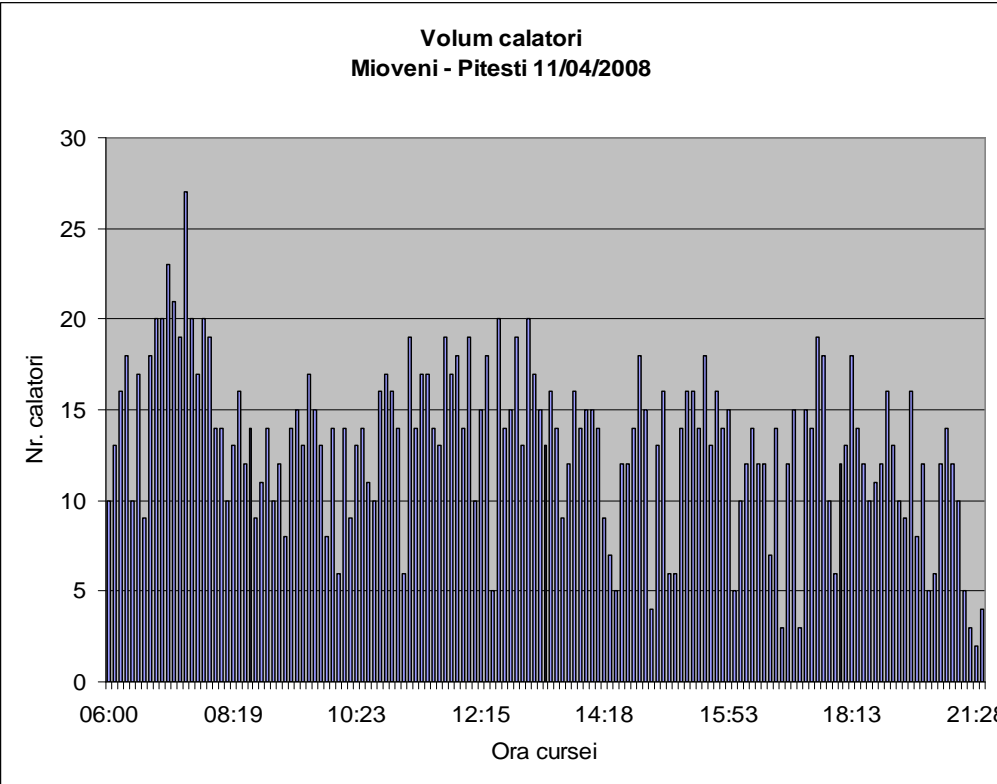
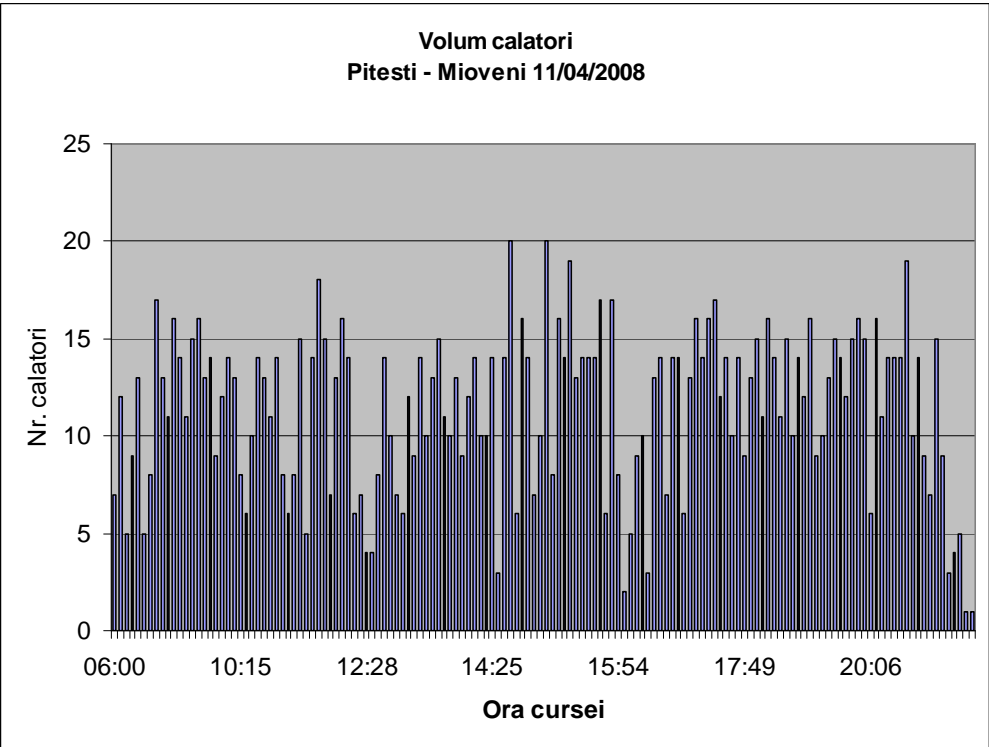


Fig. 3. The daily passenger volume on the Pitesti – Mioveni route.

2. PROPOSALS FOR DEVELOPING THE TRANSPORT SYSTEM

Using the traffic data collected (the daily number of cars that go to the Dacia plant) and the data on the special transport journeys for the Dacia employees (daily, 11275 employees travel by bus), we note that the proportion of those who travel by public transport on the Pitesti - Mioveni route is quite high, of about 70%, the rest of 30% travelling by personal cars.

The proposed target, in order to promote a line of modern transport, is to maintain the proportion of 70% for public transport, which will have two components: the new rapid transport line (will cover about 50% of passengers) and the bus transport (which would keep 20% of passengers) - Fig. 4.

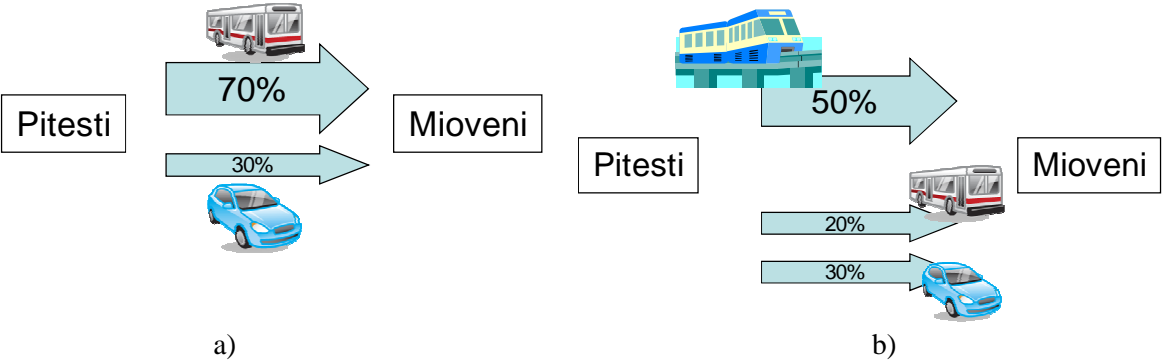


Fig. 4. The proportion of the transport modes on the Pitesti – Mioveni route:
a) – today; b) – perspective.

For the future modern transport line foreseen to be developed, there are two possible routes, either over the bridge placed in Titesti and through the Mioveni town (A option), or by Colibasi (B option, shorter with 4 km) - Fig. 5.

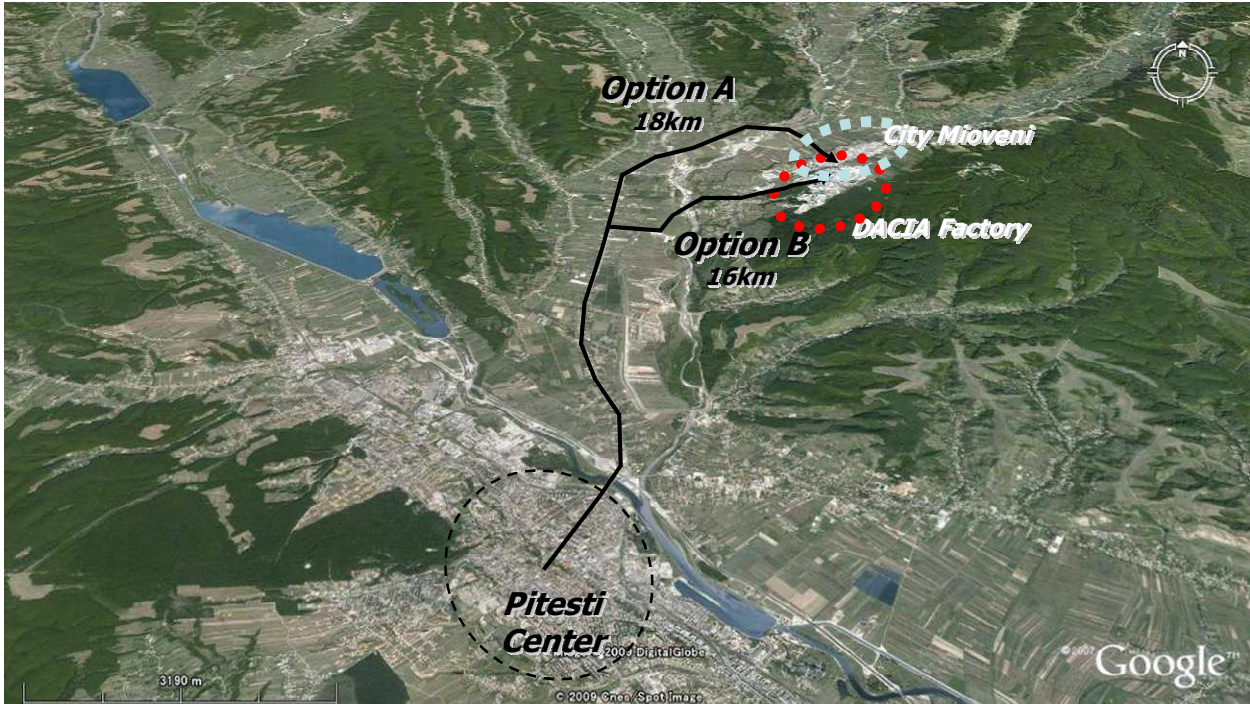


Fig. 5. The two variants for the rapid transport line on the Pitesti – Mioveni route.

As we presented before, the Pitesti city is situated along the Arges river, on the direction South – East and North – West. On the direction East – West, the Pitesti city is situated on six terraces of the so-called Arges hills, with an altitude varying from 250m up to 406 m. This configuration rise great difficulties in organizing the road traffic, especially because there are only few roads connecting the Eastern and Western areas of the city.

For the Pitesti city, considering the layout of the residential areas and the existence of three central areas where only the pedestrian movement is allowed, our proposal is to investigate the possibility of promoting a modern transport system (for example, a monorail). This will have, in the first phase, a semicircular configuration, making the connection between the Eastern and Western areas of the city (between the lower and the upper terraces of Arges hills). On this direction, the actual public transport network has no lines deserved by buses.

Figure 6 presents the configurations of the lines of the modern transport system proposed.

The blue line is placed on the longitudinal direction of the city, deserving the areas with the great demand for public transport.

The red line will provide the connection between the Western and Eastern parts of the city, and also intersect the red line and make connection with it. The red line will pass over the Arges river and will make the connection with the public transport line on the Pitesti – Mioveni route.

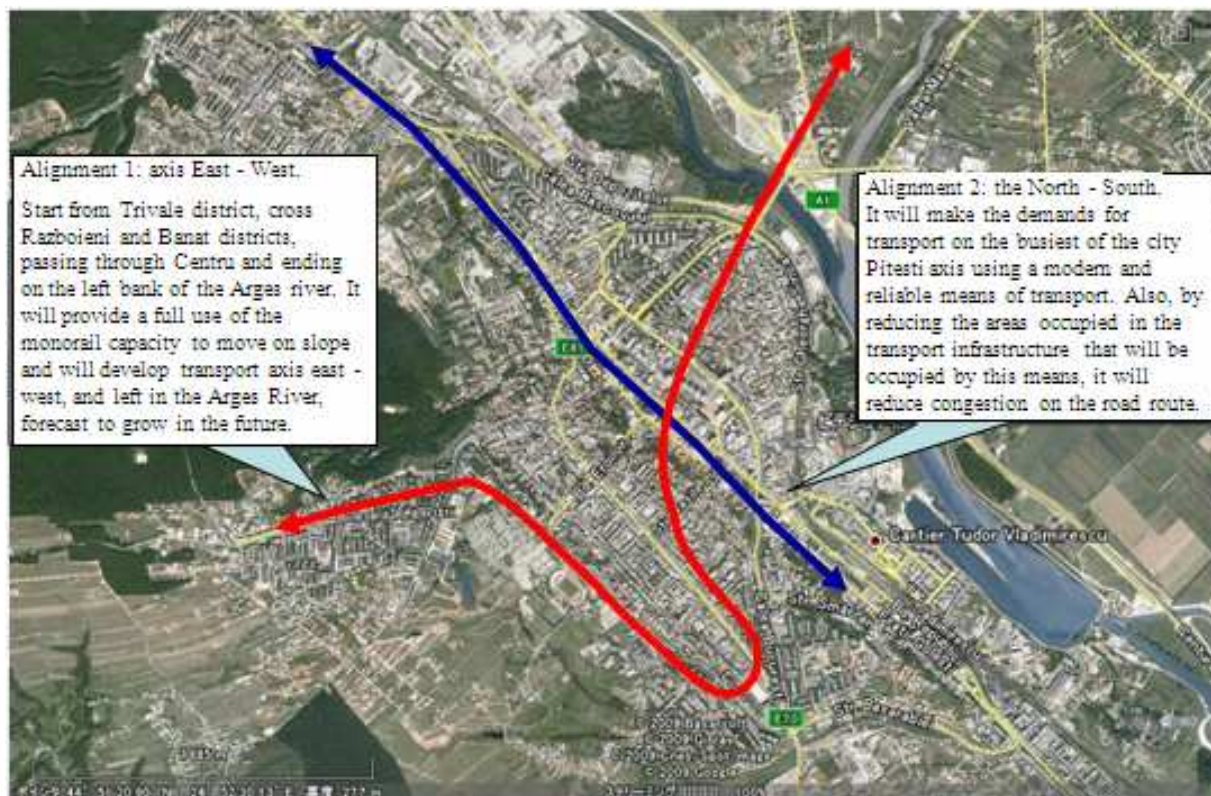


Fig. 6. The configurations of the lines of the new transport system.

3. PLANNING THE ACTIONS FOR DEVELOPING AN UNITARY TRANSPORT SYSTEM

In order to achieve this goal, it is necessary to analyze more transport solutions, which finally lead to an optimal solution for the integrated, unitary and sustainable transport system for the Pitesti – Mioveni route.

Therefore, we proposed to analyze all the opportunities offered by the existed infrastructure (including the railway), by completing the five projects presented in Table 2. The schedule for realising all these projects is presented in Fig. 7.

Table 2. The project proposed to be achieved in order to develop an unitary transport system.

Nr. crt.	Name of the project	Actions and Objectives
1	Urban Traffic Survey in the Greater Pitesti Metropolitan Area (GPMA) and Develop the Urban Transport Analytical Model	Conduct the traffic survey and develop the computerized models to simulate the traffic demand/supply balance in future
2	Bus Exclusive Lane Installation in the Pitesti Center	Expand capacity of traffic link for public transport in the city axis, install the exclusive link for public transport
3	Monorail Development in Pitesti City Residential Area	To alleviate the traffic congestion from the growing hill side to Center, and improve transport environment
4	Railways Utilization and Installation Passenger Car Operation	Install railway services between Pitesti-Mioveni, using existing heavy rail infrastructure
5	Improvement of Road Transport Situation between Pitesti-Mioveni	Improve the road capacity of the Pitesti-Mioveni link, and in order to maintain the vehicle traffic growth in near future

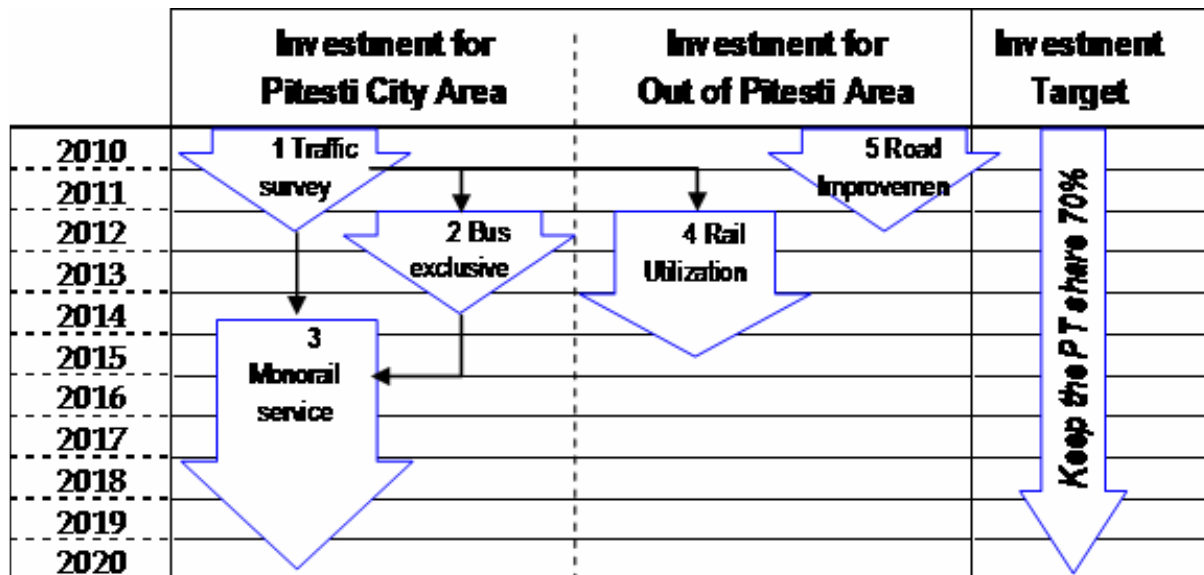


Fig. 7. Planning for implementing the projects for developing the transport system.

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