



**HAL**  
open science

# The need for a new Boulevard. The case study of Cantemir Boulevard, Chişinău

Alexandre Munteanu

► **To cite this version:**

Alexandre Munteanu. The need for a new Boulevard. The case study of Cantemir Boulevard, Chişinău. Humanities and Social Sciences. 2015. dumas-01269727

**HAL Id: dumas-01269727**

**<https://dumas.ccsd.cnrs.fr/dumas-01269727>**

Submitted on 5 Feb 2016

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Université Pierre-Mendès France  
Institut d'Urbanisme de Grenoble  
Urbanism, Habitat and International Cooperation  
Mundus Urbano

# THE NEED FOR A NEW BOULEVARD

## THE CASE STUDY OF CANTEMIR BOULEVARD, CHIȘINĂU

Student: Alexandru Munteanu  
ID: 21428158

Supervisor: Kamila Tabaka

Grenoble, 8/09/2015

<b>Analytical note</b>			
Name	Alexandru Munteanu		
Thesis title	The need for a new Boulevard. The case study of Cantemir Boulevard, Chişinău		
Defence date	08.09.2015		
Institution	Institut d'Urbanisme de Grenoble – Université Pierre Mendès France		
Supervisor	Kamila Tabaka		
Collation	95 pages	5 annexes	110 references
Key words	transportation, mobility, public transportation, boulevard, axis, city centre, city development, sustainable development		
Geographic key words	Chisinau, Moldova, Cantemir Boulevard, centre		
Abstract -en-	<p>The literature on urban transportation indicates that the main challenge in the field today is the negative impact of automobile-oriented development, exposing it as an unsustainable model. As a result, there is debate regarding methods to reduce automobile dependency.</p> <p>This thesis uses empirical analysis and survey data to explore the potential impact of the proposed Cantemir Boulevard planned for construction in Chisinau, the capital city of the Republic of Moldova. Proponents claim it will alleviate traffic congestion and respond to the needs of pedestrians.</p> <p>The data collected assesses resident awareness of the intended project, the potential impact to residents, patterns of pedestrian mobility and opinion on the legitimate necessity for the boulevard.</p> <p>The results indicate there is a lack of resident-based knowledge about the long-term impact a project of this scale will have on the area. It is ultimately the recommendation of the researcher to abandon the project for more sustainable methods of traffic reduction, which will simultaneously improve the quality of life for residents.</p>		
-fr-	<p>La littérature traitant de la mobilité urbaine indique que le plus grand enjeu dans ce domaine aujourd'hui est l'impact négatif du développement axé sur l'automobile, démontrant ainsi qu'il s'agit d'un modèle non durable. Comme résultat, apparaît le débat au sujet des méthodes visant à réduire la dépendance face à la voiture.</p> <p>Cette thèse utilise l'analyse empirique et les bases de données afin d'explorer l'impact potentiel du Boulevard Cantemir planifié à Chisinau, ville-capitale de la République de Moldavie. Ses partisans affirment qu'il soulagera la congestion du trafic et répondra aux besoins des piétons.</p> <p>Les données collectées évaluent la connaissance du projet envisagé par les habitants, l'impact potentiel pour ces résidents, les schémas de mobilité des piétons et l'opinion sur la nécessité légitime de ce boulevard.</p> <p>Les résultats indiquent qu'il y a une lacune dans la conscientisation de la part des habitants quant aux retombées qu'un projet de cette échelle aura sur le long terme sur la zone. Au final, la recommandation de l'auteur de la présente thèse est d'abandonner ce projet pour des méthodes plus durables de réduction de la circulation lesquelles vont en même temps améliorer la qualité de vie des habitants.</p>		

# Table of Contents

List of figures and tables .....	ii
<b>I. INTRODUCTION .....</b>	<b>1</b>
<b>A. Research question.....</b>	<b>1</b>
<b>B. Literature review.....</b>	<b>4</b>
1. <i>A city for cars: the invention of the car and the change in city development.....</i>	<i>4</i>
2. <i>Car-dependent societies.....</i>	<i>11</i>
3. <i>The paradigm shift in city building and development: make car-free cities and better life quality for its citizens .....</i>	<i>15</i>
4. <i>The modern view over urban transportation and future goals .....</i>	<i>21</i>
<b>C. Chişinău .....</b>	<b>26</b>
<b>II. CANTERMIR BOULEVARD ANALISYS.....</b>	<b>40</b>
<b>A. What means Cantemir Boulevard?.....</b>	<b>40</b>
<b>B. Research methodology.....</b>	<b>47</b>
<b>C. Data Analysis .....</b>	<b>53</b>
1. <i>Survey data analysis.....</i>	<i>53</i>
2. <i>Data on the Cantemir Boulevard.....</i>	<i>63</i>
3. <i>Case studies .....</i>	<i>67</i>
<b>D. Research limitations.....</b>	<b>72</b>
<b>III. CONCLUSION.....</b>	<b>73</b>
<b>IV. APPENDIXES .....</b>	<b>79</b>
<b>V. BIBLIOGRAPHY .....</b>	<b>91</b>

## List of figures and tables

<b>Figure 1.</b> The New York Times coverage of car violence from November 23, 1924.....	8
<b>Figure 2.</b> Left, a cartoon from 1923 mocks jaywalking behaviour. Right, a 1937 WPA poster emphasizes jaywalking dangers.....	9
<b>Figure 3.</b> GE streetcar ads from 1928, left, and the early 1940s, right, emphasize the efficiency of mass transit over private automobiles.....	10
<b>Figure 4.</b> The street - an abyss, as seen by Karl Jirg.....	10
<b>Figure 5.</b> EU28 greenhouse gas emissions by sector and mode of transport, 2012.....	17
<b>Figure 6.</b> Transformation in transportation. Co-modality .....	24
<b>Figure 7.</b> Copenhagen’s “Transit First” Spatial Evolution: From Finger Plan, to Five-Axis Radial Investment, to Corridors of Satellite, Rail-Served New Towns.....	24
<b>Figure 8.</b> Caption of today’s situation of the historical core of Chisinau with what remained from the medieval roads.....	27
<b>Figure 9.</b> Map of Chisinau of 4 Sept 1789. Can be observed the bastion on the North-East of Chisinau and the Tsarist military troupes installed on the Western bank of the river Bîc.....	28
<b>Figure 10.</b> Chisinau systematisation plan of 1817 .....	29
<b>Figure 11.</b> Chisinau Master Plan. Refined under the supervision of A. Şciusev. Approved in 1951. ....	33
<b>Figure 12.</b> Microrayon (Chisinau, Buiucani district) with such facilities as schools and kindergartens. Also, inner courtyards in between the blocks of flats. ....	34
<b>Figure 13.</b> The master plan of 1968. Authors R. Kurts and S. Shoikhet, architects. ....	36
<b>Figure 14.</b> Chisinau Master Plan, 1989 .....	38
<b>Figure 15.</b> An overview on how Chisinau's structure changed during the last 100 years. Marked with red is the Cantemir Boulevard in different master plans of the last century; with blue is market the part of it that is build, but it is outside of the historical centre. ....	42
<b>Figure 16.</b> The red lines of the roads (which correspond with the master plan) in Chisinau city centre. Can be seen the finished part of Cantemir Boulevard and the part which is supposed to cut through the old city centre.....	43
<b>Figure 17.</b> The transversal section of the Cantemir Boulevard. ....	46
<b>Figure 18.</b> This chart shows how people travel through the city centre. ....	54
<b>Figure 19.</b> Charts showing how often people travel to other parts of the city (left) and what transportation means they use for that (right).....	55
<b>Figure 20.</b> Charts showing how often the people from outside come to the centre (left) and the traveling modes they choose for that (right). ....	55
<b>Figure 21.</b> The graph shows the data on why people come to the city centre. ....	56
<b>Figure 22.</b> a) If you need to travel to other neighbourhood than Centre, how do you go there? .....	57
<b>Figure 23.</b> Travel time by car (a) and by public transport (b) to all directions. ....	60
<b>Figure 24.</b> The level of understanding of the historical value of the medieval city centre among the respondents. ....	61
<b>Figure 25.</b> Total number of employees (dark grey) compared to the number of inhabitants (light grey), 2010.....	65
<b>Figure 26.</b> The Flow of automobiles entering and transiting the centre in thousands of units during five hours, 1988. ....	66
<b>Figure 27.</b> Streets represented on the map.....	66
<b>Figure 28.</b> The centre of Yerevan. Opera Square, Northern Square and Republic Square are highlighted. ....	68
<b>Figure 29.</b> The Buzesti – Uranus Axis (left in red) doubles the historical North-South Axes (centre Victoriei Road, right Magheru Boulevard). In yellow are marked the protected areas. ....	69

<b>Table 1.</b> Summary of how, where and when the survey took place. ....	51
<b>Table 2.</b> Age and Sex distribution .....	54
<b>Table 3.</b> Mobility patterns of the people concerning their daily activities: work, shopping, bringing children to school / kindergarten and recreational time.....	58
<b>Table 4.</b> Why do people think transportation system works inefficiently in Chisinau. ....	59
<b>Table 5.</b> The relation between understanding the value of the medieval city core and the plan for the boulevard .....	62
<b>Table 6.</b> The differences in opinions of the two groups of people from the centre and outside centre. ..	63
<b>Table 7.</b> The level of streets' capacity usage in the centre of Chisinau, 2005 .....	64

# THE NEED FOR A NEW BOULEVARD.

## THE CASE STUDY OF CANTEMIR BOULEVARD, CHIȘINĂU

### I. INTRODUCTION

#### A. Research question

It took a while for the society to realise how much it is *automobilised*. Statistics today point to the constant increase of automobiles on the roads (Dupuy, 2011). One needs just to go out of his place to encounter the abundance of cars on the road. This is since it was invented, the automobile gradually occupied more and more space in peoples' lives. It is the actual physical space it takes to park or drive a car. However, it is also the 'space' perceived in time of peoples' personal and professional lives. The main accent here is on the level of people's reliability on the automobile. There is too much trust that the cars will take us faster to the destination. However, in many cases the arrival is delayed and this for reasons of traffic congestion, time spent for finding a parking space or car breakages. Of course, the positive changes that the invention of the car brought are undeniable. Once the travel speed was increasing, the distances became shorter and the life was happening faster. Together with the evolution of new technologies, which allowed people live farther from each other, the need for better transportations modes and systems became more acute. On another level, development started to flourish when the same trade of goods was taking place at a more rapid pace (Urry, 2011). Everyone had to win while in the meantime car usage turned into a lifestyle and the dependence of it is constantly growing (Dupuy, 2011). One way or another, it is widely known and accepted that cars today play an important role for the well-being and development of the society and that to some extent the living conditions we have today are due to the major invention of the motorised mode of travel and transportation. However, all these come at a price.

As it could be understood from this first introductory paragraph, in the following text I will be talking about transportation issues, mobility and transformation of the urban space after the invention of the car. To illustrate that I chose to show the example of a very dear to me city.

My research is concentrated on analysing the current situation in the city of Chisinau, Moldova. The paper will focus on transportation within the city and urban mobility and, especially, it will treat the relation cars versus people.

Chisinau is the capital city of Moldova and today the city together with its metropolitan area is inhabited by a population of 700 thousand.

In the period since World War II until the beginning of the 1990's the country encountered a fundamentally new form of governance. When the Soviet Union installed its rule over the country, Chisinau was in ruins and rubble. This gave to the authorities the opportunity to redevelop the city following the regime's ideologies and beliefs. The responsibility for the elaboration of the new master plan, in the late 1940s, was entrusted to the architect, Alexei Sciusev, and his team. He had a vision that would give the city a completely new look, as the nation had to revive and flourish under the new rule after the World War II. The redevelopment was car-oriented, since industrialisation of production was one of the main objectives pursued by the command of that period. This included the construction of large roads and boulevards to accommodate more cars. According to the new developmental strategies and the constant increase of car numbers, the city planners, in the late '60s, forecasted a rapid *automobilisation* of the society and called for urgent measures which in one way happened to be in building a new large boulevard, cutting through the city centre, to support the increasing number of cars.

Ultimately, the decision to build the new boulevard materialised only on the master plan, without ever being completely realised (built). Today the boulevard is known as the Cantemir Boulevard. The plan was that the boulevard should cut through the city centre, a mainly residential zone, just few hundred meters downtown and parallel with the already existing city's main boulevard. Once the decision was made and the master plan was approved, the area along the axis was marked for redevelopment with no further interventions allowed until the plan was realised. Present days, more than 40 years later, the city and its inhabitants still bear the consequences of this decision and the lack of any action. This decision put the people into a difficult situation. They had their households there, but with no legal right to improve or extend their living space. As a result, they were provoked to act informally and find a way around the issue. This included unauthorized constructions and the bribing of legal authorities. This is why one of the central consequences, which the planning of this boulevard dragged after it, was the constant degradation of the area along the boulevard's axis, which continues until today.

Moreover, the axis of the boulevard passes through the historical core heart of Chisinau. This is an area of high historical and architectural value, whose potential is up to be explored and valorised.

#### Research aims and objectives

Bearing this in mind and returning to the topic of the thesis, I researched extensively on the car dependency of Chisinau and analysed the issues from different perspectives. The study resulted in a comprehensive overview over the problem and my research question: **Will the Cantemir Boulevard reduce the traffic congestion in the city centre of Chisinau?**

The objectives for this research are:

- To know what is the level of car-dependency in the city
- To understand the need for a new boulevard through the city centre by analysing obtained data
- To recognise, through research, best practices and example of cities with similar problems
- To research for alternatives for the Cantemir Boulevard

### Research Methodology

My research methodology is manifold. I started with an extensive study of current literature resources. This helped me to grasp better what are the new tendencies in city planning regarding transportation and mobility. At the same time, I was able to identify best practices and examples of cities, which currently are dealing or had dealt with similar issues. One important aspect I need to mention is that I do not intend to make a comparison study between Chisinau and other Western European cities. Rather, through research, I tend to show that developmental alternative strategies exist and they need to be considered. In addition, looking through other cities' experiences at the problems Chisinau is facing today will help me better understand and thoroughly answer the research question. On the other hand, the field research, in Chisinau, in the neighbourhood where the boulevard's axis cuts through, and the work with questionnaires helped me directly interact with the people and understand their position about the boulevard. At the same time, having been able to meet the city authorities gave me the opportunity to know better the reasons behind the decision of building a new boulevard through the city centre.

## B. Literature review

### *1. A city for cars: the invention of the car and the change in city development*

The following passages present a general debate and view over the automobile centred city planning and development. I start with the very beginning and show the evolution of the car since it was invented until today's tendencies in the field of transportation and criticisms brought to the automobile. I explain how the car became an important part of our lives and argue about the paradigm shift oriented to reduce car usage within cities.

The first self-powered carriage was designed and built by the French inventor Nicolas-Joseph Cugnot (1725 - 1804), in 1769. It was a three wheeled structure propelled by a steam engine. The machine was designed for the by the military forces and was more a tractor for carrying heavy artillery weapons, than it was built for transporting people. Cugnot was, also, the first man in history to get into a car accident when, in 1771, he drove his vehicle into a wall. For the next century inventors continued to work on developing better working engines for the automobile, developing a bigger and more sophisticated variety of engines (Bellis, n.d.)<sup>1</sup>. In the first years of the XIX century, the number of sold gasoline cars outnumbered all the other types. Even though the automobiles were built manually and every piece was slightly different from each other, the demand for them on the market was constantly growing. There was a need for an industrialised car production to satisfy the market's demands and it was not long awaited (Bellis, n.d.).

Although the design of the modern automobile was perfected in Western Europe, especially by the German and French inventors in the late 1800s, the industrial domination over the market, in the first half of the twentieth century, was held by the Americans. This is due to Henri Ford's car mass production innovations, which he implemented in the first decades of the twentieth century. The moving assembling lines have begun to function in the years '13-'14th of the previous century and have revolutionary impacted the production of cars (History.com, 2010). Furthermore, it had a revolutionary social and economic impact on the world. Together with that started a process of intense and constant industrialisation, which triggered a rapid urbanisation of the society. As long ago as in 1938, 24 years after the innovations in car mass production were implemented, Louis Wirth writes in his article *Urbanism as*

---

<sup>1</sup> In *The history of the Automobile*, Marry Bellis writes about the many attempts of the inventors to create, beside the steam engines, also engines propelled by electrical or gasoline generated power. However, the technological state-of-the-art of that time did not allow the inventors develop long lasting batteries and in most of the cases the batteries where not researchable. This, as a result, influenced the distance of the travel. Moreover, this technology was very expensive and together with all the other weaknesses was deemed to fail. The change came with the combustion engines. As fuels where used gasoline (or petrol), diesel and kerosene. The combustion engines had a clear advance. Their production was cheaper, as well as their maintenance, they were and able to travel longer distances.

*a Way of Life* that “the growth of cities and the urbanization of the world is one of the most impressive facts of modern times” Wirth (1938:). The word ‘impressive’ here conveys a tone of positivism with which contemporary researchers and scientists, most probably, would not agree. However, about that later in the following chapters of this paper.

The first successful car, which would run on gasoline, was built, in 1893, by two bicycle mechanics, J. Frank and Charles E. Duryea of Springfield, US. They also won the first American automobile race in 1895 and, already, in 1896 they put their one cylinder engine car on sales on the American market. The next decade an immense number of companies (485) entered the automobile market and by the year 1899, 2500 cars were produced for the American elite, given the fact that not everyone could afford to buy an automobile at that time. However, with Henri Ford’s innovation techniques, the car building became standard (and affordable) and by the year 1920, in the United States, three biggest manufacturers emerged known as the “Big Three”: Ford, General Motors and Chrysler (History.com, 2010). This way the Americans dominated the world’s car industry market the first half of the twentieth century.

In 1908 Henri Ford put on the market his famous Model T, which followed another successful car, Model N. Model T was supposed to reach the vaster market and make it affordable enough not only for the wealthiest of the country, but for the broader population, as well. Remarkable in this car were the assembling techniques and the standardisation of all the details. This kept the building costs down and hence, increased chances on highly competitive market of that time. Model T was meant to be “the farmer’s car”, aim which was well achieved, but the great success of this automobile was unpredictable. Due to its structure<sup>2</sup> and low price<sup>3</sup>, the car had interested not only the farmers, which had the primary interest in transporting their products, but also the townsmen, which saw in Model T an effective mode of traveling across the widely spread country. In Europe, for example, the situation was different. Being devastated, in the beginning of the twentieth century by social and political struggles and then by the First World War, it remained behind the Americans in terms of automobile industry. History.com writes that the European continent would only adopt new automobile mass production techniques only in 1930s, but this, in spite the fact that the World War II was to come, would still make it leader in automobile production industry in the second half of the past century (History.com, 2010).

---

<sup>2</sup> The site History.com (2010) writes about the technological state-of-the-art of which Henri Ford had benefited. Reaching remarkable achievements with Model T’s predecessor, Model N, which the “Cycle and Automobile Trade Journal called the four-cylinder, fifteen-horsepower, \$600 Ford Model N (1906-1907) “the very first instance of a low-cost motorcar driven by a gas engine having cylinders enough to give the shaft a turning impulse in each shaft turn which is well built and offered in large numbers.” (2010:n.d.) Making use of the last technological advances, Model T combined in it “two-speed planetary transmission [...] easy to drive [...] high chassis was designed to clear the bumps in rural roads. Vanadium steel made the Model T a lighter and tougher car, and new methods of casting parts (especially block casting of the engine) helped keep the price down.” (History.com, 2010)

<sup>3</sup> When it was first put on the market, in October 1908, Model T was sold for \$825. The price continued to decrease so that by the year 1912, after Ford built the Highland Park factory, in 1910, in Michigan, the price dropped to \$575 (less than the average annual wage in the United States). By the time when the car was removed from the assembling lines and not produce any more, in 1927, its price fell to \$290. (History.com, 2010)

Major changes in transportation infrastructures have happened after on the market was released Ford's Model T. Being a result of state-of-the-art technology of the time and responding to common man's needs, moreover, being available at a reasonable price, Model T urged for physical transformations of the usual city and countryside landscapes. The changes were not long awaited. They came with *Federal Aid Road Act of 1916*. This was the document, which literally brought urbanisation to the countryside. Richard F. Weingroff argues that as basis for considering the federal-aid concept served several factors (Weingroff, 1996). However, the mass production and mass demand of the Model T was one of the main reasons why this document was put forward. In his paper, *Federal Aid Road Act of 1916: Building the Foundation*, Weingroff states that the drivers gathered power with the help of the American Automobile Association, "which became one of the strongest backers of federal action on roads". It was not an easy task to accomplish, though. Different actors had various interests and expectations from this Act. On one hand, farmers were opting for the improvement of the post roads (roads on which the post office would carry the post) on which they would transport their goods to the larger market. This, accordingly, was a project, which was promoted from earlier years<sup>4</sup>, from which the Congress had only to learn and drag conclusions, since it was too small to make major changes. From another hand, drivers were interested in long distance paved motorways for satisfying their private needs. Ultimately, favouring the farmers, the Congress enacted the Act, for improving and building new post roads, which was signed by the president Woodrow Wilson on July 11, 1916 (Weingroff, 1996). Later, in the beginning of the next decade, was signed another document, which came as a continuation of the *Act of 1916, Federal Highway Act of 1921*. The latter *Act* added funds to support the development of an interconnected interstate highway network. However, the problem of the interstate highway network will not be addressed until later, in 1956, when a new *Federal Highway Act* will be passed with more allocated funds for construction of some 41.000 miles of interstate highways.

Whereas, at the inter-county and interstate levels everything was going well: farmers were enjoying new post-roads and better quality services brought to the countryside (like faster post medical services) and the motorists enjoying traveling long distances on the newly developed interstate highways, the cities, figuratively speaking, were like battle fields. The 'fights' were for the streets, otherwise the public spaces. Hunter Oatman-Stanford, in his article (Oatman-Stanford, 2014) referring to Peter Norton's book (Norton, 2008), argues about the social and physical changes and the struggles which the American cities are enduring for the last 100 years since the mass production and spread usage of the car. This

---

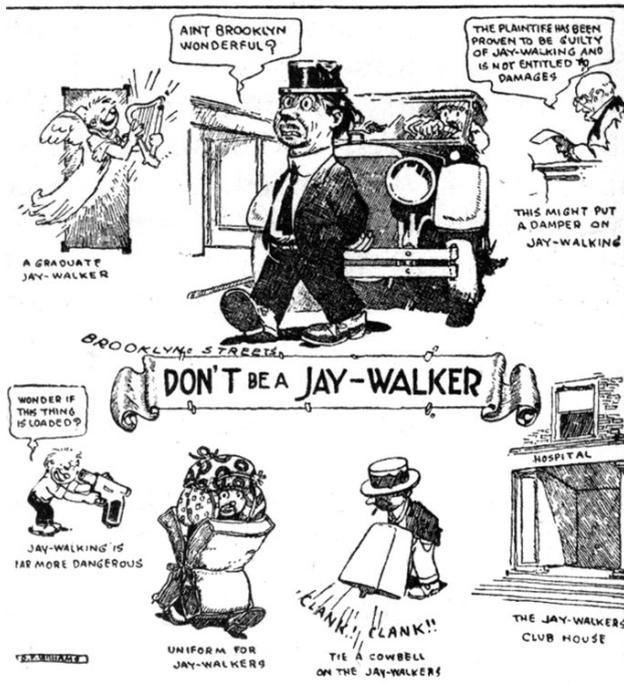
<sup>4</sup> Weingroff (1996), referencing *America's Highways 1776-1976*, of the Federal Highway Administration, US Department of Transportation (DoT), Washington, DC, explains that the act was a contested document since farmers and motorists were not in the best relations. When farmers were seeking for good roads to transport their goods to the larger market, the motorists were interested only in racing and by that frightening the livestock. "It was even alleged that some farmers buried spikes and glass in the roads to puncture tender tires" (DoT, 1976:57). This way, in 1912, the Congress passed an experimental project, through Post Office Department Appropriations Bill, to improve post roads.

means that the invention of the car, putting it on the roads, later making it widely available by industrially mass-producing it, came at a price and not without repercussions. The streets, before the car intruded into the city, were public spaces (also, it is important to mention their limited sizes). Pedestrians were everywhere and their habit in using these spaces 'powerfully ingrained', as Oatman-Stanford names them (Oatman-Stanford, 2014). The streets were common spaces where pedestrians could go anywhere, even children were playing here and there, and every citizen had equal rights to them. Especially, the laws were removing the responsibility off pedestrians and were charging the person who was operating the heavier or more dangerous vehicle (Norton, 2008). However, the opinions about the utility of the car were shared. Whilst in the countryside the automobile was seen as a rescue from the remoteness of the place, in the cities the automobile was regarded more as an 'unnecessary luxury'. There was even a name invented for the motorists because of that. Since most of the earliest cars had drivers to drop and pick up their passengers later, the chauffeurs, in the meantime, were engaging themselves into 'speeding around wildly'. This was the reason why they were called 'joyriders' (those who were enjoying the ride). The term caught up and soon all types car drivers were 'joyriders'. In addition, because of the speeding, other names were coming up like, "vampire driver" or "death driver." Newspapers from the 1910s and '20s from the American cities were ringing the bells and repeatedly stating about accidents involving automobiles resulted in injuries and deaths (Figure 1). For the period of a few years, the number of accidents with fatalities increased dramatically. Oatman-Stanford states that, in the first years after the First World War, the amount of deaths on the roads was outnumbering those who died in the battlefields in Europe (Oatman-Stanford, 2014). Sadly, most of those injured were the children. As facilitating factor, were, as mentioned above, narrow city streets and pedestrians' habits. Nevertheless, these are not the reasons why, rather these are conditions, which were neglected. However, legal authorities were not catching on and if they did, the reaction was coming with delay.

The first steps for the mitigation of these devastating accidents, also to dealing with the constantly increasing traffic were taken by the municipality of New York City by adopting the traffic code, in 1903. These were the first attempts to control the traffic and give it somewhat a legal status. Gradually, after that, speed limits were enforced all over the American States and by 1910 many cities were working on regulating cross-roads and their traversing. At the same time, tired for waiting public authorities' reactions, the civil society with the help of the newspapers mobilised itself for raising awareness among the community about the danger coming from the automobile. It was, rather, a harsh way for doing that. Norton, supports the argument saying that memorials were erected, in several cities, in the memory of the dead children in car accidents. They looked like war monuments, even though they were temporary structures. This, how Norton explains it, shows how much the streets were considered public spaces. People killed in accidents were commemorated this way and considered public losses.



## A Traffic Problem—Jay Walking



## DON'T JAY WALK



Figure 2. Left, a cartoon from 1923 mocks jaywalking behaviour. Right, a 1937 WPA poster emphasizes jaywalking dangers.  
Source: <http://www.collectorsweekly.com/articles/murder-machines/>

referred to a clueless person new to busy city life ("jay" was slang for a hayseed or country bumpkin) (Oatman-Stanford, 2014). Simultaneously, in schools kids were taught why they should not be playing on the streets and how the place where they were playing until now is only for cars.

Moreover, Oatman-Stanford states that a culminating strike was when, in 1935, through the Public Utility Holding Company Act, which intended to reduce corruption, forced electric utilities companies, who were running streetcar networks to bankrupt (Oatman-Stanford, 2014). The law removed state's support through subsidies and during the next decade, many streetcar service providers had to close their businesses. Even with that, many streetcar companies were bought by big automakers (like General Motors) with the scope of dismantling the existing infrastructures and replacing them with fleets of busses. Thus making the Americans more and more fuel dependent. Even campaigns of companies like General Electric (GE) were not enough to convince the, already, car dependent population of the importance of the mass transit systems (Figure 3).

In the meantime, the urban planners and traffic engineers were working hard on accommodating more and more the car in the city. By redesigning the existing streets and developing new ones, they were elaborating new systems for keeping the traffic moving smoothly and making pedestrians less and less important and excluding them from the streets.

## Crowds ... and the Street Car's answer

**OUT** of the multiplying perplexities of the traffic problem, one fact emerges clearly; the electric street car is our most efficient means of moving masses of people.

The street car passenger occupies six square feet of traffic space. The automobile passenger requires an average of 44 square feet. In thirty of our largest cities, street cars are now carrying over 30,000,000 passengers daily. Attempt to put them in automobiles, and the street—which cannot easily expand its curbs—would be too narrow to hold them.

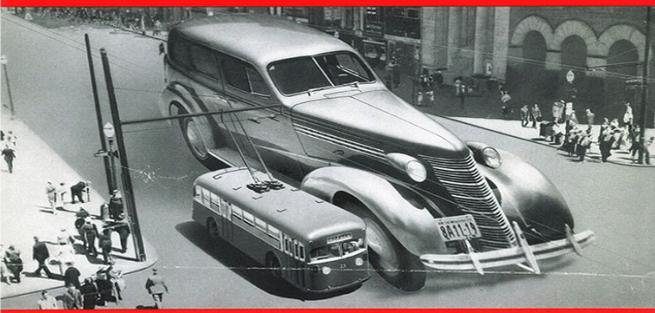
The street car is handling the crowds. Hundreds of capable and far-seeing street railway executives are busy modernizing equipment and improving schedules so that to-morrow and the day after, winter and summer, this essential public servant may do its work even better and win a still larger measure of popular cooperation.




The next time you board a street car, notice how smoothly it starts and stops, how quickly it gathers speed. Much of this improved equipment carries the General Electric monogram—the same monogram as on the efficient and dependable electric appliances that save time and labor in the electrified home.

# GENERAL ELECTRIC

## Automobile Actual Size



**1 Trolley Coach Will Seat All the People Who Ordinarily Ride in 24 Automobiles Requiring at Least 10 Times As Much Street Space\***

**WE ASKED** our trick photographer to make a picture showing you an automobile in its true light—considering the number of people it usually carries and the amount of street space it occupies. Even though the result looks monstrous we assure you it's very much on the conservative side.

Now we don't propose to hinder progress. The fact that almost every American family can own an automobile is a fine thing. But when they use automobiles in the limited street space of a city to the extent of seldom or never using the public transit system, thus causing stagnation of traffic, then it is time for traffic engineers to go to the source of the trouble.

The way to reduce traffic congestion is to revitalize the MOST EFFICIENT USER OF STREET SPACE—THE PUBLIC TRANSIT SYSTEM. Any city government can render the citizens a real service by co-operating with the transit company to modernize and promote increased use of its system.

People like to ride in modern electric coaches. They carry them swiftly, noiselessly, comfortably, and at low cost. Furthermore, this means of travel pays its own way. We think that when the facts are known they will appeal far more to the people than huge expenditures for street widening, express highways, and municipal parking lots which load them with unfairly proportioned taxes—and never provide more than a partial solution of the problem.

**REVITALIZE PUBLIC TRANSIT TO REDUCE TRAFFIC CONGESTION**

# GENERAL ELECTRIC

Figure 3. GE streetcar ads from 1928, left, and the early 1940s, right, emphasize the efficiency of mass transit over private automobiles.

Source: <http://www.collectorsweekly.com/articles/murder-machines/>

In such an aggressive manner, the automobile imposed itself on the city streets by pushing to the sides the simple pedestrian. The illustration, made by the Swedish artist Karl Jirg, precisely highlights how much the cities have changed during the last century and how less space has been left for the people. It conveys the small amount and dangerous nature of street space dedicated for those who do not use a car (Figure. 4).

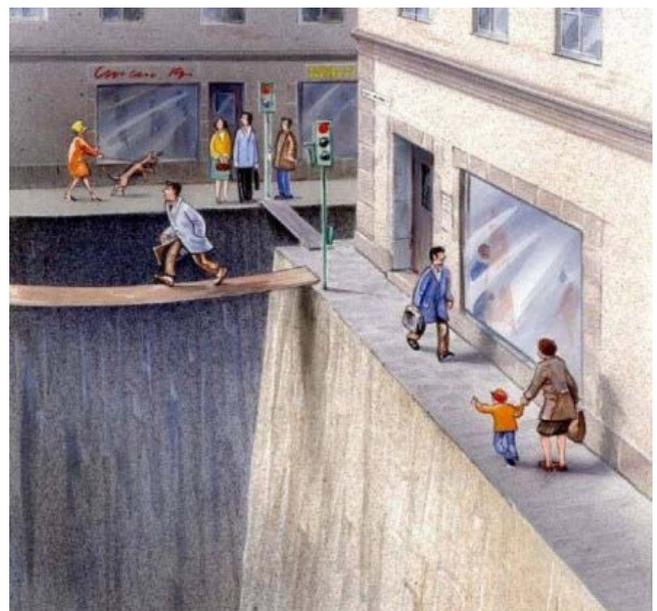


Figure 4. The street - an abyss, as seen by Karl Jirg  
Via <https://urbanful.org>

## 2. *Car-dependent societies*

On the other side of the Atlantic, in Western Europe, things were developing following a different trajectory. During the first half of the past century, the European continent was in a difficult situation. Being devastated by two World Wars in 30 years, its society had lesser opportunities for intense car development as the US did. Although, the car was perfected in France and Germany, a greater social and economic impact it had on the United States (History.com, 2010). Even with that, the automobile, as it happened in the US, has substantially marked the European life, as well.

In his paper, *The social ideology of the motorcar*, André Gorz brings huge criticisms to the car, arguing that the tragedy of the contemporaneity consists in car's place in people's lives. The car is a luxury good which cannot be democratised and like villas on the beach if everyone would have one it will not be considered a luxury (Gorz, 1973). The car, Gorz writes, as a villa (precisely a beach house), also takes space from the other who use the same road (cyclists, pedestrians, streetcar and buses) and it devalues when it is used by the masses. However, the worst is, as he writes, that many politicians still encourage the population to possess one, as everyone has the right for that. Then the government will make sure that there is enough parking space for everyone and necessary infrastructure systems. The paradox, however, of the car is in its induced freedom that the motorists can drive whenever and wherever they want, while the truth is that they become dependent on their cars. They depend on fuel, all kinds of repairs, spare parts and so on (Gorz, 1973).

In the past, in between the years from 1920s and 1960s Europeans were looking at the Americans as at a role model in car development and its adaptation within the city spaces. Today, researchers state that there has been a change and since the last 20 years, Americans follow West European examples. Car-dependence and increasing unsustainable transportation have made the US planners make the shift (Buehler, 2014). What made this shift happen was the change in attitude towards the car in Europe starting with the 1960s. Buehler writes that many West European countries started to restriction car usage by promoting public transportation services, walking and bicycling<sup>6</sup>. He also argues that there are nine reasons, which show why the Americans are more car-dependent than Europeans are. It started all with *Mass motorisation*: it happened with the industrialisation of the car production and with the comparative wealthier American than European population, especially after the WWII, Buehler argues, which made the American people easier afford personal cars. Then it is because of the *Road standards*: as a result of the mass motorisation of the society, the US were the first to develop standards for roads, bridges and tunnel in order to adapt the car, whereas in Europe this process was taking place slower, especially before the WWII. The third reason is the lower *Vehicle taxes*: US citizens paid less tax for car ownership and use than Europeans. Moreover the price for gasoline is twice as more expensive in Europe than in America,

---

<sup>6</sup> See: (Gössling, 2013) and (Bertolini and Le Clercq, 2003)

thus the car demand in Europe is smaller; also, in Europe the tax revenues resulted from car usages contributes to the general fund, whilst in the US these taxes pay directly the road development. *Interstate system*: the Interstate Highway System, which cuts through the America's cities, combined with programs of urban renewal and slum clearances literally erased entire parts of cities and contributed to urban sprawl, thus provoking more personal car usage, while European authorities subsidised roadways at lower level and for shorter periods. The *Government subsidies*, also is a reason for a more car-dependent US society, Buehler argues. European Governments spend less on roadways than motorists pay taxes and fees. The sixth reason is the *Technological focus* and response to problems, like sustainability and safety, of the US government. For problems as air pollution, the responses are technological solutions like catalytic converters or reformulated cleaner fuels. While in Europe, even though they take the same measures, they also reduce more the speed limits, cut from parking lots, create car free zones and together with other policy changes, they encourage behavioural shifts. Related to *Public transit* Americans still are lagging behind. After the WWII, many US transit services increased their fares, cut from services and thus lost clients. Later, they were bankrupted or were helped by the Government ownership. However, Europeans are more successful at this part, argues Buehler. The final two reasons explaining why Europe is less car-dependent than the United States are the *Walking, Cycling, and Zoning laws*. While only few cities in America have implemented amenities for walking and cycling, many cities in Western Europe have entire networks of bicycle paths and pedestrian zones. At the same time, when land use planning policies allow greater mix of uses in the residential zones on the European continent, in order to facilitate shorter trips and encourage walking and bicycling, the American laws forbid these mixes. Also, as Buehler states, American zoning codes still require minimum number of parking spots, whereas Europeans opt to maximum limit the parking lots, thus discouraging car usage.

Nonetheless, whether we want this or not, are we in the US, Europe or anywhere else, the society has become highly motorised. However, researchers argue that the world is not uniform motorised, but there are more and less motorised societies. Gabriel Dupuy in his book, *Towards Sustainable Transport: The Challenge of Car Dependence*, explains that on this hierarchical ladder of who is more motorised and car-dependent, the two countries at the opposite extremes are: The United States and China (Dupuy, 2011). He writes that however persistent the Chinese government would not be in its effort to transform the country into an industrialised society, the automobile system has not managed to take over the country yet. More, China has a highly developed bicycle practice, which impedes the evolution of any automobile system. Car-dependence is, therefore, Dupuy claims, non-existent and there would not be any need to diminish it. Whilst, on the opposite side, the most motorised and car dependent society, the US's policy in adopting transportation systems was very liberal. This means that anyone able to own a car - did so. The result was an overdeveloped automobile system. In this hierarchical ladder, Western Europe is somewhere in the middle, between China and the United States. However, even here there are small

differences from country to country. France has reached most of the indicators to line up with America. The only thing that still keeps it away from being a fully car dependent country is the good service of the public transportation system. There are also the United Kingdom and The Netherlands. With its deteriorating mass transportation system, the UK's situation is a little worse than France's is, while the bicycle system of The Netherlands keeps the country at a lower car dependence levels. Despite these situations, none of these countries is willing to go the level of China's almost inexistent motorisation. Yet, they are reluctant about the American trends, as well. Ultimately, these countries struggle in a difficult condition. They are leaning towards anti-car movements but are hesitant to take definite actions (Dupuy, 2011).

In other words, car-dependence, as a phenomenon, is giving headaches to planners and policy makers (who want to make a change) all over and has resulted in many repercussions. In a report published by the UK Sustainable Development Commission (SDC), the author Duncan Kay states that the research done by the institution has resulted in identification of a wide range of issues caused by the automobile over-usage (Kay, 2011). The bitter part here is that those who are most affected are the lower socio-economic groups and the result is social segregation (Dupuy, 2011; Motte-Baumvol et al., 2010). Some of the problems that the less advantaged of the society face today are bigger probability to be hit by a vehicle (especially children) and higher death rate as results of car accidents, also less travelled distances in comparison with the richer of the society and else (Kay, 2011). Consequences caused by car-dependence phenomenon are facing other countries as well. For example France, especially the outer suburbs of Paris, is confronting with socio-spatial segregation. The data analysis made by Motte-Baumvol et al. for a period of 9 years, until 1999, demonstrates major social segregation of the outer suburbs of Paris (Motte-Baumvol et al., 2010). The authors explain it stating that lower-income groups tend to reduce their mobility patterns (Hivert and Péan de Ponfilly, 2000)<sup>7</sup> and to leave car-dependent areas for more accessible places. This being a reaction of moving to the outskirts (for less expensive land) of those with high income and bringing with them high car uses costs (Dodson and Sipe, 2007)<sup>8</sup>. Where, in fact, live and work low-income households (Berger, 2004)<sup>9</sup>. Hence, Motte-Baumvol et al. prove that there is a self-regulatory system in periurban areas which tends to equilibrate the balance between high and low income groups (Motte-Baumvol et al., 2010). The equilibrium occurs by pushing out the latter, which is not able to keep up with car-dependence and moves towards areas with higher accessible services and less car-dependent places, thus creating social segregated communities.

As shown above, car-dependence phenomenon is not an easy phenomenon to deal with. However, researchers all over the world study insistently the issue trying to come up with solutions, which

---

<sup>7</sup> Cited in (Motte-Baumvol et al., 2010)

<sup>8</sup> (idem)

<sup>9</sup> (idem)

would match best a given circumstance. There exist different approaches to investigate this ‘thorny question’, as Dupuy calls it (Dupuy, 2011). One perspective to look at car-dependence is from a statistical point of view. McIntosh’s et al. paper is analysing automobile related data for a period of forty years, from 1960 to 2000, of 26 global cities (McIntosh et al., 2014). Their research concentrates on examining the role of such factors as culture, economics, climate, transport infrastructure and urban form as opposed to previously done researches and analyses (Kenworthy, 2010; Kenworthy and Laube, 1999)<sup>10</sup> which pointed only towards transit services and urban density as being central elements contributing to car-dependence. The method is innovative and the first of its kind. They used information from the Global Cities Database to “econometrically model [it]... over a four-decade period, use regional classifications to segment the data, and introduce the use of city archetypes to explain car VKT<sup>11</sup>/capita” (McIntosh et al., 2014:107). This digital method, ultimately, lead to the conclusion which proved wrong previous ideas that increased personal car usages are results of factors as urban density and transit services. Moreover, this is not a casualty of road capacities. The model showed that rail-based transit services are the solution to decreasing VKT per capita, hence inhibiting car-dependence. This way, McIntosh et al. recommend focusing on the development of rail-based transit services for cities looking for decreasing their car-dependence levels (McIntosh et al., 2014).

On a different level, other studies show that car-dependence has deeper roots. Yalachkov et al. explain in their paper how car-dependence phenomenon can be regarded from neuroscience perspectives (Yalachkov et al., 2014). Their research and analyses show that the phenomenon of car-dependence has behavioural patterns. Based on the claim that “broad spectrum of behaviours can become habitual... [and] resistant to change” (Yalachkov et al., 2014:227) the researchers explain how neuroscience and human geography can collaborate for better understanding of factors that make people become car-dependent. This also can help to develop different approaches aiming at elaboration of new policies for change in transportation habits. Ultimately, Yalachkov et al. state that conventional approaches for changing behavioural mobility patterns of the car-dependents do not give the expected effect (Yalachkov et al., 2014). Instead, the interdisciplinary approach (of the two scientific fields) will have visible results, as it will emerge into a more in-depth analysis of the issue, which in turn will help to identify the motifs behind the mobility patterns of the car-dependent ones. This, consecutively, as the theoreticians argue, is the key point for changing car users’ habits in favour of the sustainable modes (Yalachkov et al., 2014). Such perspective over the car-dependence is, definitely, innovative and quite interesting, which will take the research further ahead and, hopefully, it will come up with more working approaches and solutions.

---

<sup>10</sup> Cited in (McIntosh et al., 2014)

<sup>11</sup> Vehicle Kilometres Travelled

### *3. The paradigm shift in city building and development: make car-free cities and better life quality for its citizens*

However discouraging the car-dependence phenomenon would not sound, there are actions taken towards making the shift to better city environments, lessen car numbers on streets and improving life quality. Researchers since, as early as '60s and '70s, have predicted the ascendance of the automobile and have seen in it a danger, whose 'assault' on peoples' lives would have great impacts (Mumford, 1964; Dupuy and Robert, 1976; Sauvy, 1968)<sup>12</sup>. For the last two decades, theoreticians are arguing about a paradigm shift towards a more sustainable transport (Marshall, 2001; Newman and Kenworthy, 1999; Banister, 2008; Dupuy, 2011). Therefore, further on I will discuss the issue of sustainability and more in depth how sustainability relates to transportation and mobility studies.

First things first, let us see and understand what sustainability is and what is about the sustainable mobility paradigm. The site dictionary.com defines *sustainability* as "the quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance" (Dictionary.com, 2015). As understood from the definition or otherwise simply speaking, sustainability is when less to no harm is made to the environment (green nature, waters, air, fossils etc.) in order to have more quality living places (both urban and rural) for unlimited or maximum extended period. On the other hand, United Nations explains sustainability as "a decent standard of living for everyone today without compromising the needs of future generations" (United Nations, n.d.). One important aspect they put forward is the future generation. This means that contemporary society has to think twice before taking a decision and foresee all the possible drawbacks in order not to put in danger generations to come and ensure for them, as minimum, the same conditions we enjoy today. This should, as the officials state, include new or better modes of doing things like:

- Creating access to clean energy for everyone, and make sure that the energy we produce doesn't contribute to climate change;
- Developing cities so that everyone can enjoy a decent quality of life;
- Developing transportation systems that allow us all to get where we want to go, without causing too much congestion and pollution.

The question of sustainability, however, started to worry the global arena already since the early '70s of the past century, when the UN, in 1972, organised the "UN Conference on the human Environment in Stockholm". At this meeting, some 113 countries agreed to begin cleaning up the environment, as well as, to initiate programmes for engaging international actors to commence dealing with the questions on how not to bring more damages to the environment. This for the simple reason that pollution does not know boundaries (Newman and Kenworthy, 1999).

---

<sup>12</sup> Cited in (Dupuy, 2011)

The dominant topic discussed nowadays among researchers, academics and scientists is the question of climate change and its mitigation plans to undertake. United Nations urges for immediate actions to inhibit or diminish effects of pollution and constant degradation of the environment or failure to do so puts under threat the human development progress, especially the underdeveloped of the world (United Nations, n.d.). At the same time, European Union launched the *European Climate Change Programme (ECCP)*, which together with the member countries aim through policy making at lowering greenhouse gas emissions<sup>13</sup>. So far, there were two phases of The ECCP. For the first one were established a range of important working groups to concentrate on environmental issues, among which are listed agriculture, industry, energy supply and demand, transportation and so on. During the second are kept the same priorities, the main one being reducing CO<sub>2</sub> emissions through transportation reforms.

Indeed, transportation effects on the environment are undeniable and reducing emissions produced by burning combustible has become crucial. Today, Marshall argues, transportation is seen as part of the problem in the context of sustainable planning and development, as opposed to few decades ago when the modernist planner saw a solution in the car (Marshall, 2001). The tendencies, he says, are to reduce the travel rather than adding to it. The same ideas are shared by Banister who states that cities nowadays are to be more compact (again in contradiction modernist planning), with mixed used developments with advanced public transportation systems which would connect cities' major transportation hubs (Banister, 2008). The optimal population number of such cities should be around 50000 and a density not more than 40 people/ha. Such cities would be nearly located and form the so called polycentric metropolises (Hall and Pain, 2006)<sup>14</sup>. It is not for nothing that the transport is blamed to be contributing majorly to the unsustainability of the contemporary world. Marshall says that the impacts of the automobile on the environment are manifold (Marshall, 2001). Besides the amount of noxious gas emissions (Figure 5) the car unloads in the environment<sup>15</sup>, it also occupies a lot of land (not only in terms of road infrastructures, but also storages, mechanical shops, places for disposals and else) and it is one of the biggest energy consumer (the energy consumption level raised with 50% for the period from 1970 to 1995 in Europe). It is also the key reason for humanity's moral damage and deaths (Marshall, 2001; Oatman-Stanford, 2014).

However, it is imperative to note that the numbers of travel volumes have multiplied by thousands. For the last 300 hundred years the distance travelled by an average person in the UK has alarmingly increased from 9 to 10000 km/annually (Marshall, 2001). The most impressive increases, although, have happened

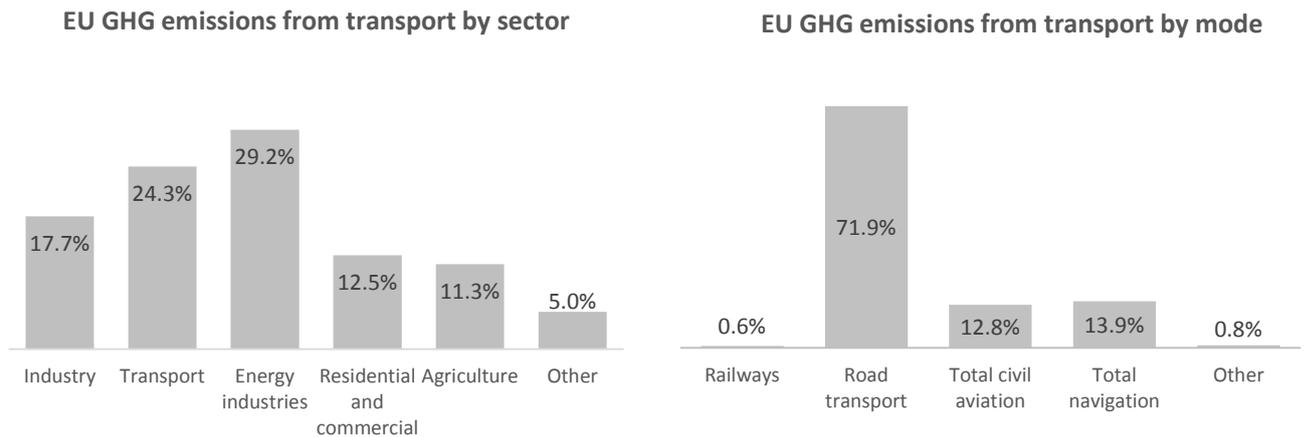
---

<sup>13</sup> For more details see the official webpage of the programme:

[http://ec.europa.eu/clima/policies/eccp/index\\_en.htm](http://ec.europa.eu/clima/policies/eccp/index_en.htm)

<sup>14</sup> Cited in (Banister, 2008)

<sup>15</sup> In 2006, globally carbon emissions per capita only from cars are 1.07 tCO<sub>2</sub><sup>15</sup>, 2.53 tCO<sub>2</sub> for the EU countries and 6.80 tCO<sub>2</sub> for the US (Banister, 2011)



**Figure 5.** EU28 greenhouse gas emissions by sector and mode of transport, 2012  
 Source: [http://ec.europa.eu/clima/policies/transport/index\\_en.htm](http://ec.europa.eu/clima/policies/transport/index_en.htm) (adapted data)

since the mid of the last century and the most used mode was chosen to be the car. At the same time, one may think that the travel have become more attractive, although this is not, necessarily, the reality. Banister says that a trip is made not for the sake of making it, but because of the activity at the end of it (Banister, 2008). The numbers in travelled distance increased, Marshall argues, because of the technological advancement in transportation (increased speed) however the budget (because the people became wealthier or the prices have gone down) and the time travelled did not change (Marshall, 2001). Generally speaking, this combination of increased traveling speed with the same budget and time has an enormous impact on the environment, since faster travel by car requires more energy and larger roads (Marshall, 2001). On the other hand, air travel is several times more polluting than the road transportation. Even with that, the travellers are not ready to pay a bigger fare choosing the sustainable option, they opting for financial and time reasons, which in turn will take them faster or cheaper to the destination (Marshall, 2001). This is another principle explaining how people choose to travel, defined by Banister, who says that a combination of the two (price and time) is decisive in choosing the optimal travelling mode (Banister, 2008).

In the end, to make the change for sustainability happen, it is important to put forward a range of policies and planning decisions, which would work together by complementing and reinforcing each other. Today, in cities of Europe the governments are concentrated to diminish the traffic in the centres, while the actual problems are out of it and in between cities. However, changes here can be tricky to initiate (at least for political reasons) the measures should start with decreasing the number, length and distance of travel (Marshall, 2001).

Banister and Dupuy share the same opinion with Marshall and argue that the change should happen through advocating for sustainable mobility and making it the priority number one on policy makers' and planners' agendas (Banister, 2008; Dupuy, 2011; Marshall, 2001). Sustainable mobility stands for consolidation of the relationship between transportation and land use planning, while studying the

city's complexity. The city is to be the home for most of the population in the world and the shift to more sustainable mobility patterns have to be taken with maximum responsibility (Banister, 2008) but, sadly, no (productive) actions have been taken (Banister, 2005) or so far we have witnessed no results. *The sustainable mobility paradigm* paper, by David Banister, notes that the balance in urban development is when the social dimension prevails over the physical one (Banister, 2008). In other words, it is when people and proximity are the starting point in building the urban shape and adapting the traffic. The two dilemmas that Banister discusses, as basis for building his arguments, are the transport as a derived demand or as a valued activity, also what the minimum or the reasonable travel time is. The main accent, Banister writes, should be put on diminishing the number of trips, reduce their lengths (in distance and time) and increase [public] transport systems' efficiency<sup>16</sup>. Even though this is not an easy task to accomplish, the change can happen when there is active citizen support and there are new ways of communication between the experts and the people. Now that the priorities are set, as pointed by other authors as well, only an interdisciplinary approach (Yalachkov et al., 2014) (by combining common forces of specialists, researchers, academics, practitioners, policy makers and activists) can efficiently solve the difficulties the cities face today (Banister, 2008). The shift to sustainable mobility will take effect with sufficiently strong arguments, which would weaken car-dependence.

Form the other hand, for Dupuy the shift to sustainability can happen by shaking the modern view that the car gives freedom (Dupuy, 2011). Whereas the truth is that it gives more dependence than freedom. He also calls to the scientists to re-orient their research for studying the combination car vs. walking. The reality is, he argues, that we are walking because we need to explore the world and the space [we live in] has been formed to give access for those who walk. Hence, we are all dependent on walking, but because it is taken for granted, only those with impaired mobility understand it (Dupuy, 2011).

Newman and Kenworth are arguing, the same as Dupuy, that reducing car-dependence is a step forward towards sustainability (Dupuy, 2011; Newman and Kenworthy, 1999). However, sustainability, the authors say, should not be a final destination. It rather should become a process or, otherwise a lifestyle which needs to be adopted (Newman and Kenworthy, 1999). For coming closer to this, a city must set a list of indicators or goals (measurable and easily understandable by everyone) in order to constantly guide it in its attempts to create more sustainable and lively communities (World Bank, 1994). Below are some indicators extracted from a list of 150, recommended by Word Bank, which, in this case, are related to city transport:

- *Suitable forms of affordable transport should be available for all income groups, and vulnerable groups such as the poor, women, children, the elderly etc.;*
- *Average travel time in the city should not be excessive;*
- *Transport accidents should be reduced;*

---

<sup>16</sup> The same ideas were put forward by (Marshall, 2001)

- *Freight costs should be at a minimum;*
- *The road network should be in good repair and roads should not be congested;*
- *Vehicles should comply with emission regulations, and should be fuel-efficient;*
- *Sufficient public or mass transport seats should be available to meet demand;*
- *Fares should reflect economic costs, to permit sustainable operations.*

(World Bank, 1994)<sup>17</sup>

Nonetheless, these goals are not nailed and do not establish limits. They rather, are a set of example indicators, which can be adapted to each condition in part, and, even more, should be modified accordingly. To make them work, however, it is not sufficient just to adopt them but, more, they have to be parts of processes oriented to their constant advancement. Only by tailoring them with programmes and policies they can positively affect the sustainable development of the city (Newman and Kenworthy, 1999).

On another level, carmakers also keep the pace with the new trends in city development. This is because either, they are afraid not to lose customers and money or they started to care about the environment (what I doubt about, but who knows). More likely, and I tend to lean towards this, is that they are being forced (indirectly) by numerous factors (political, economic, social) to realise the change. This way, many manufacturers are starting to produce cars, which they claim to be environmentally friendly and with no side effects further polluting the nature. Today on the market customers can find automobiles propelled by electricity (BEV and FCV<sup>18</sup>), bio-fuels and else. The so-called disruptive innovations are entering the market on a constant basis. However, their success depends on how innovative the technology is or is the innovation a steady advancement of the existing technology (Hardman et al., 2013). Disruptive innovations are, Hardman et al. writes, for example “innovations that are so different that their establishment in the market causes a disruption to the pre-existing system”<sup>19</sup> (Hardman et al., 2013:15439). In the automotive field today such disruptions are caused by cars driven, for example, by electrical power. The car company that stands out in this field is Tesla Motors. Being one of the youngest car manufacturers, Tesla is developing automobiles for niche markets. Their success in the field is secured by their ambition and use of the state-of-the-art technology. The strategy is to make

---

<sup>17</sup> cited in (Newman and Kenworthy, 1999)

<sup>18</sup> Battery Electric Vehicle and Fuel Cell Vehicle

<sup>19</sup> Some examples of disruptive technologies, shown by Hardman et al. are: (1) The introduction of the quartz watch in the 1970s which lead to the demise of the Swiss watch industry and mechanical watches; (2) The introduction of the mass produced automobile which eventually served as a replacement to horse drawn carriages; (3) The introduction of digital cameras in the 1990s which eventually took the mass market share in the photography sector away from film cameras and the market leader Kodak; (4) The introduction of steam ships which eventually replaced sail driven ships; (5) The introduction of hydraulic excavators as an alternative to conventional cable driven machines; (6) The recent introduction of eReaders (and tablets such as the iPad) that have already had an impact on book sales (and possibly laptop sales) and are predicted to reduce sales further; (7) The introduction of mp3 players, especially the iPod in 2001. Which saw the replacement of personal CD and tape players (Hardman et al., 2013:15440)

their vehicles cost competitive with the ICE<sup>20</sup> cars and to take advantage of the added value of the BEVs (Hardman et al., 2013).

Other car manufacturer who is making progresses on the field of environmentally friendly vehicles is the Toyota Corporation. This year the company released its long tested model Toyota Mirai<sup>21</sup>, namely the car of the future. The model is propelled by an electric motor, which is powered by hydrogen. Its truly innovative technology was studied and tested by the producers for the last 20 years. It is the first hydrogen VFC to be launched in mass production which instead of noxious gases it is emitting water vapours (Toyota, 2015).

On the same topic, there are good news from Germany too. The federal state has inaugurated its first hydrogen charging station for VFC vehicles on the autobahn. This, in the context that, so far, there is only one mass-produced vehicle (Toyota Mirai) which uses such technology. The country has already installed 20 such points in cities and airports and, even more, it plans to reach the number of 50 in 2015 (Meşter, 2015).

Talking about charging stations, the Land of the Rising Sun, Japan, is the country which recently reached the turning point in having more electrical vehicle charging stations than it has gasoline charging stations. Whilst, Europe is a little behind where countries such as UK, the Netherlands and Norway are leading the list (Green Car Congress, 2015). This not unexpected, since on the automotive market there is, already, a range of BEVs<sup>22</sup>, aimed at day-by-day usage with comparable performance and quality in comparison with the ICE cars and which run at very low costs (Hardman et al., 2013).

It is clear that the world is on the right track now and it understood that a paradigm shift towards sustainable mobility is imminent. Technological advancement is proving to be of significant use for that. However, only through technological applications the change would be more difficult to achieve. Banister notices the importance of the today's technological advancement, but points out at the necessity of including also the people and stakeholders in transport planning and this because of "understanding the rationale behind the policy changes and that behavioural change follows" (Banister, 2008:75). At the same time, the author accentuates that a possible 'rebound' in form of increased traffic could happen because of high efficiency of the vehicles. Nonetheless, technological advancement is an important principle of the sustainable mobility paradigm (Banister, 2008).

---

<sup>20</sup> Internal Combustion Engine.

<sup>21</sup> "Mirai" in Japanese means "Future".

<sup>22</sup> Such models as Nissan Leaf, Peugeot iOn, Mitsubishi i-MiEV, Renault Twizy and Zoe, Smart Electric and a few more are already running on the roads (Hardman et al., 2013).

#### *4. The modern view over urban transportation and future goals*

The intense use of the automobile for the last 100 years has developed in the today's world a, as argued earlier, society highly dependent on cars. In addition, the forms and sizes of the cities have radically changed. They have become more spread and congested. Cities, especially the big ones, live under clouds of pollution. The population is in constant growth and today a half of the world's population live within urban areas and prognosis is that the numbers will increase until about 70% by 2050 (United Nations, 2014). What will be the cities like in the future? Moreover, what are the plans for the future of transportation? These and other questions will be discussed further in the next paragraphs. I will show what the modern perspectives in the field of transportation in terms of planning are also, what the plans for improving transportations systems in order to better the city environments and its citizens can be.

An inspirational paper was published by the European Commission, which addresses challenges that cities are facing today. The paper aims at raising awareness of the possible future impacts of a range of trends, such as demographic decline and social polarisation and the vulnerability of different types of cities. One of the key challenges of the "Cities of Tomorrow" (European Commission, 2011a) is represented by the sustainable mobility component. As an overall subject, it is regarded through the prism of energy-efficient sustainable public transport systems; implementation of new means of transport, environmentally friendly, such as cycling and promotion of walking; proximity and ease of access of different parts of the city by all mode of transportation; good connection with sub-urban networks as well as transportation hubs which should integrate well with social, cultural and economic activities, including leisure. All these come in the context of the paradigm shift in city development. It transforms the evolution of city building by reclaiming urban spaces from cars and reorganise them for the people. Thus, the contemporary city is a city for people but cars. It is a fierce struggle between metal and people. It implies changes in systems, even more changes in the way we regard urban landscapes today.

In the "Cities of Tomorrow", it is argued that the shift to a more sustainable mobility should be done and must be a part of an integrated approach. The world must gradually choose sustainable means of transportation, like electro-cars, which will reduce city pollution. However, it will not be enough until the citizens will not be given a chance to reclaim their urban livelihoods. Environmentally friendly solutions will not be sufficient if the city congestion will be a growing problem, in the context when more fuel-efficient and electric cars will become largely affordable and adapted to consumer demands. Thus, state-of-the-art European cities strive to be non-car dependent. However, this is not an easy mission to accomplish. It implies changing the habits of the commuters and investing in innovative means of public transportation. It should be more efficient and enough attractive. Non-cars mobility also requires safe and qualitative pedestrian and cycling paths.

In 2011, European Commission published a white paper entitled “Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system” (European Commission, 2011b). This document establishes 40 initiatives planned for the next decades and envisions future transportation development by the year 2050. It aims at building a competitive transport system that will increase mobility. At the same time, it proposes to reduce Europe’s oil dependence and carbon emissions by 60% by 2050. The key goals include:

- No more conventionally fuelled cars in cities.
- 40% use of sustainable low carbon fuels in aviation; at least 40% cut in shipping emissions.
- A 50% shift of medium distance intercity passenger and freight journeys from road to rail and waterborne transport.
- All of which will contribute to a 60% cut in transport emissions by the middle of the century.

The working framework contains a set of actions through which the aimed initiatives should be reached. It includes such visions as:

*A Single European Transport Area* – it should ease the movements of citizens and freight, reduce costs and enhance the sustainability of European transport. It includes a Single European Railway Area; transport security; quality, accessibility and reliability of transport services and else.

*Innovating for the future – technology and behaviour* – to accelerate the transition as well as making it cheaper through technical innovations, to promote more sustainable behaviour, better mobility planning, for both travel and freight.

*Modern infrastructure, smart pricing and funding* – to establish a central working infrastructure network with high efficiency of carrying capacity and consolidated volumes, which would connect from East to West the old continent. It is fundamental to have a wide application of advanced technologies and supply infrastructure for clean fuels. Transport charges and taxes must be restructured in the direction of wider application of the ‘polluter-pays’ and ‘user-pays’ principle.

*The external dimension* – because the transport is fundamentally international, most actions in the Road Maps are linked to challenges related to the development of transport beyond the EU borders.

On another level, European Commission is running the programme for Research and Innovations, Horizon 2020 (European Commission, n.d.). Horizon 2020 is the financial instrument implementing the Innovation Union (European Commission, 2014), a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Under this programme, in the area of transportation, European Commission contributes to researching into developing new solutions with low-carbon technologies, smart mobility systems and integrated services for passengers and freight. These actions are meant to develop cities with greener, smarter, more efficient transport modes and innovative solutions for safer, more sustainable and inclusive mobility.

Another project done at the European level shows similar tendencies in transportation development. The paper based on intermediate results of the RACE2050 project discusses how transportation will transform in the years to come (Hoppe and Christ, 2014). The authors analyse the relationship between mobility and borders. Looking at the problems through the concept of the “border”, they view and identify the challenges to overcome. Hoppe and Christ argue that however obvious the relationship between the mobility and border would not be, it is more complex than it seems. “Mobility interlinks physical and functional places, while borders have the potential to block interlinking flows – mobility and borders are in a sense opposed to another” the researchers explain (Hoppe and Christ, 2014:2). The argument is that systemic and physical borders should be minimised until completely erased for the future development of transportation systems. In this context, a good example of no borders region is the European Schengen Zone. By dissolving the borders between the member state was created a good developmental environment through facilitating the ease of access. This, in its turn, contributed to the economic growth of the region and encouraged mobility among countries. At the same time, countries were motivated to elaborate and implement cross-border transport systems, which would answer to the increasing high transportation and travel demands. This way, Dutch, Belgian and German public transport providers formed an association to improve public transportation system in the region, known as the “Mobility Euregio” project. On another level, Hoppe and Christ state that side effects of the existing systemic borders lead to the emergence of new mobility solutions. They prove to be more efficient by blurring the borders of transportation systems by combining different modes. The product is known under the name “co-modality” and, as Hoppe and Christ write, it will be a dominant solution in the future. An illustrative image is provided by the authors to help visualise what co-modality is about (Figure 6).

In such a manner, the researchers even foresee another paradigm shift. Sustainable mobility will be substituted with a “socially inclusive one due to user involvement and democratization of transport”, as the authors put it (Hoppe and Christ, 2014:11). Even more, this will lead to greater sustainability as the socially driven co-modal mobility uses resources in a more efficient way. In addition, as the concept of co-modality will spread and gain greater acceptance, it will beneficially affect the environment and increase its sustainability.

Among many predictions about what the future of transportation is going to be like, especially within city boundaries and in between cities, there are researchers, which argue that future sustainable evolution of cities will be following Transit Oriented Development (TOD) trajectories. This is not surprising, since the theoreticians base their arguments on practice and various implemented and working TOD solutions<sup>23</sup>. There are no fixed definitions of what TODs are (Cervero et al., 2004). However, there are attempts to define it as closely as possible to its actual role in cities.

---

<sup>23</sup> For examples / video reports of successfully working TOD systems see (Transit Oriented Development Institute:n.d.)

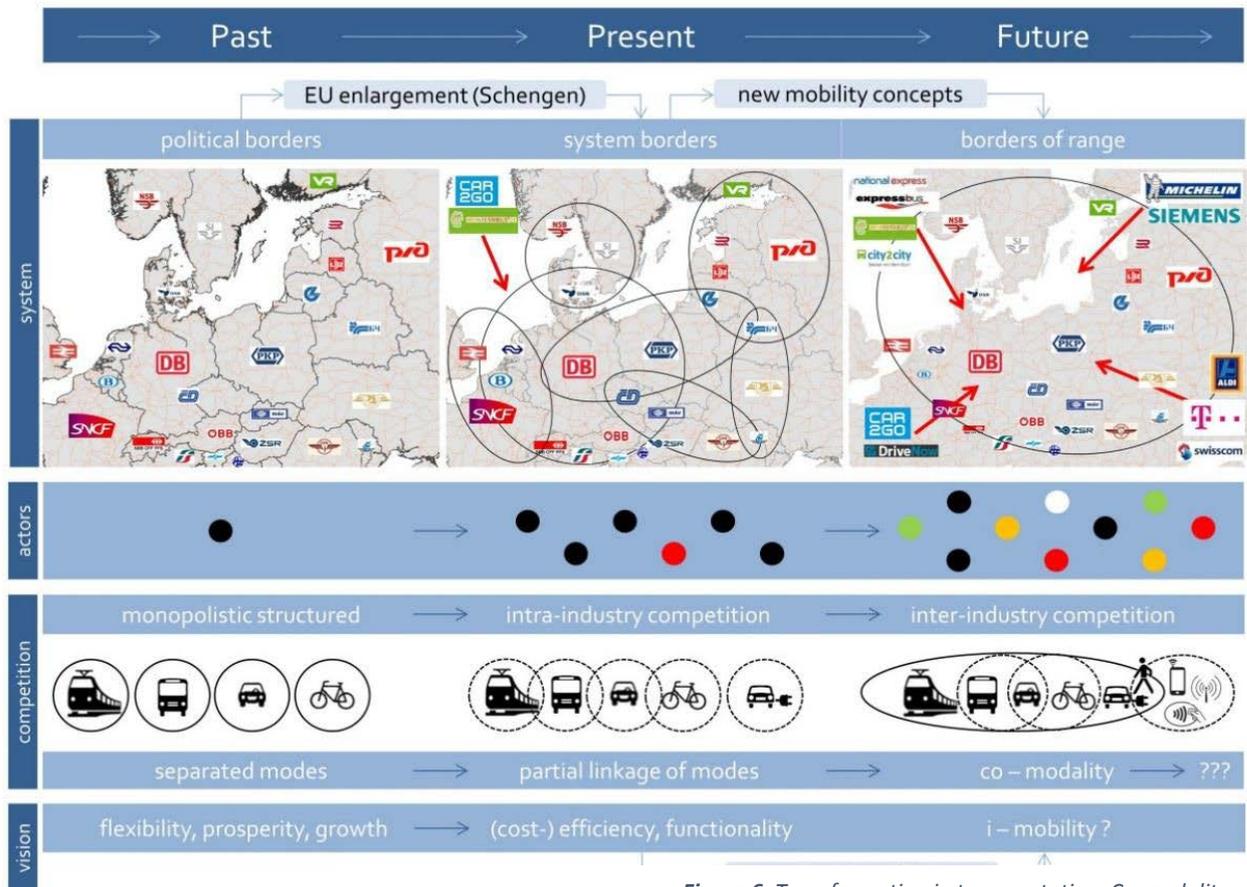


Figure 6. Transformation in transportation. Co-modality  
Source: (Hoppe and Christ, 2014)

Thus, Vale gives the following interpretation: “often described in a purely physical descriptive way: “[TOD is] a mixed-use place, with a certain urban density and high-quality walking environment, located within half-mile (800 m), i.e. 10 min walk, of a transit stop” (Vale, 2015:70). On the other hand, Cervero sees TOD as an effective instrument for hampering the uncontrolled urban sprawl and its car-dependence side effects (Cervero et al., 2004). Even though, TOD is not a newly invented concept<sup>24</sup> it is widely supported, at a global level, as a sustainable urban mobility policy (Calthorpe, 1993; Barton, 1998).<sup>25</sup> World-wide known cities which adopted TOD as their strategy for development are noted the Copenhagen, Denmark, with its famous

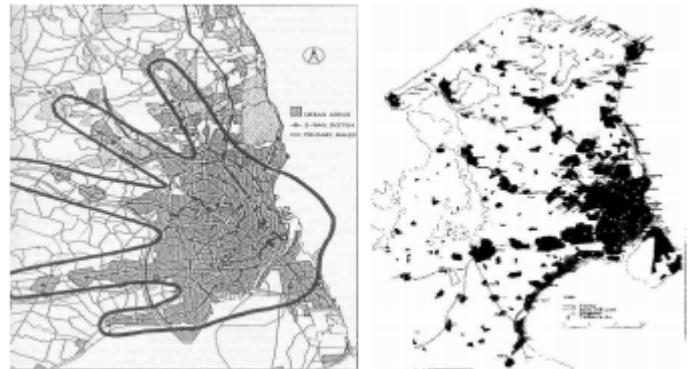


Figure 7. Copenhagen's “Transit First” Spatial Evolution: From Finger Plan, to Five-Axis Radial Investment, to Corridors of Satellite, Rail-Served New Towns  
Source: (Cervero, 2009:24)

<sup>24</sup> Cervero et al. explain that similar to TOD systems existed in the US cities 100 years ago. Then, highly walkable communities were flourishing around streetcar systems and inter-urban railways. Unfortunately, these systems were deemed to crumbling apart making way for the people with personal cars, who were moving out in remote suburbs of a metropolis (Cervero et al., 2004).

<sup>25</sup> Cited in (Vale, 2015)

'Finger Plan' (Figure 7) and the 'Planetary Cluster Plan' of Stockholm, Sweden. A successful realisation of the concept was a result of "a visual and conceptual image of the future metropolis" (Cervero, 2009:23). Although, these two Scandinavian and other worldwide cities are developed around railway systems, there are other cities, not less known, which use individual bus lanes for public mass-transportation, also noted as Bus Rapid Transit (BRT). These cities are the celebrated South American cities of Curitiba, Brazil and Bogota, Colombia (Cervero, 2009).

In conclusion of this part, it is important to reiterate, in a few lines, that the adoption of the motorcar, since it was invented until today, for individual purposes (mostly but not only), has changed and is continuously changing cityscapes, human behaviours and it has even a tremendous impact on the natural environment of the Earth. The extremely rapid change in planning thinking in terms of accommodating the automobile for cities plays the central role in this matter. By giving more space for the car (wider streets, larger parking places), the planners forgot about the most important component of the city, which, in fact, makes the place lively – the people. Once the car invaded the cityscapes, the people were evicted from the picture. Places, which once were bustling with people, became empty and lonely. However, this is just the nostalgic side of the problem.

As it is shown above, the price that the humanity had to pay (and will keep paying) is colossal. It is numbered in human lives (very important) and ecosystems' irreversible damages because of climate change. Unfortunately, the effects are irremediable and future generations will have to bear the consequences of this wasteful contemporaneous society as well. Nonetheless, there are positive aspects that the automobile and the fast transportation have brought. This is the development of a completely new industry, which created new jobs, starting from production, to selling and maintaining until disposal, from which benefits a big part of the world's population.

It is imperative, though, for the society that it takes a turn and rethinks its livelihood for maintaining a decent life quality for future generations too. Gladdening is the fact the changes are being implemented. The new technologies are definitely one of the ways out, however they should not be abused, because the automobile was new technology too and it turned out to be what we have today. The improvements in car manufacturing by making them environmentally friendly are welcomed. However, a wide adoption and affordability of these kind of cars will not radically influence the overall sustainability perspective. This will just replace the polluting with non-polluting cars, but will not affect the planning systems too much, because the automobile will remain an important part of peoples' lives and the urban landscapes will still tend to sprawl. The important aspect here is to reclaim the city from cars, renew planning theories and make urban spaces human friendly. With other words, the human being should become the centre of the urban development and not the car.

## C. Chişinău

The following lines will show the history of Chisinau and its development during the last centuries. This short introduction in city's history will beneficially affect this thesis' course, as it will broaden the perspectives over its historical development and enhance the understanding of the problems it is facing presently. Otherwise, cities are "chronicles in stone", as throughout their history they record the multitude of processes, which had happened in the society at its each stage of development while the regimes keep on changing. Thus, cities are the physical representation of the urban forms and orders of the time (Şlapac, 2008).

As morphological evolution and structure, medieval Moldovan settlements differ from the West and Central European ones. Moldovan settlements usually are not surrounded by walls, thus maintaining an open character. In addition, the settlements, in most of the cases, are not dominated by a nearby citadel or noble residences. There was also a lack of what is considered city geometry, with no central market overlooked by a church or cathedral. At some point, the habit of giving settlements with its surroundings in property to the monasteries or the gentry was the reason of inhibition of the economic growth, preserving the main activity of the people to be agriculture. That is why in many cities (even today) some houses have beside them large parcels of land, which overall give a scattered aspect to them (Şlapac, 2008). Chisinau in its turn complies with these general rules. It is located on the banks of the river Bîc, a river that played an important role during its development, on an open land surrounded only by agricultural land.

Chisinau, as a settlement was first time attested in documents in 1436. However, there are documents stating that the name of the settlement, as it is known today, appeared in historical documents only a few decades later, in 1466. This came up when the researchers discovered that in the document from 1436 the reference was made to *a chisinau*, which in popular speech meant *a spring* (Nesterov, 2010) yet, this spring was the point from where the city started to developed.

Medieval cities of Moldova developed according to several ways. These are (1) the cities which revive on antic sites of urban formations, (2) cities which develop from rural settlements as a result of beneficial geographical location and (3) cities which are installed though state's order and generally are placed near fortresses, mines, strategic roads and else (Şlapac, 2008). Chisinau, in its turn, was a rural settlement that benefited from its beneficial geographical location (Nesterov, 2010; Şlapac, 2008). Located at the intersection of major roads, which were traversing Moldova from East to West and South to North, Chisinau in short time became a market town. Consequentially, in the mid XVII-th century the town formed its first administrative system and already starting from the beginning of the XVIII-th century it

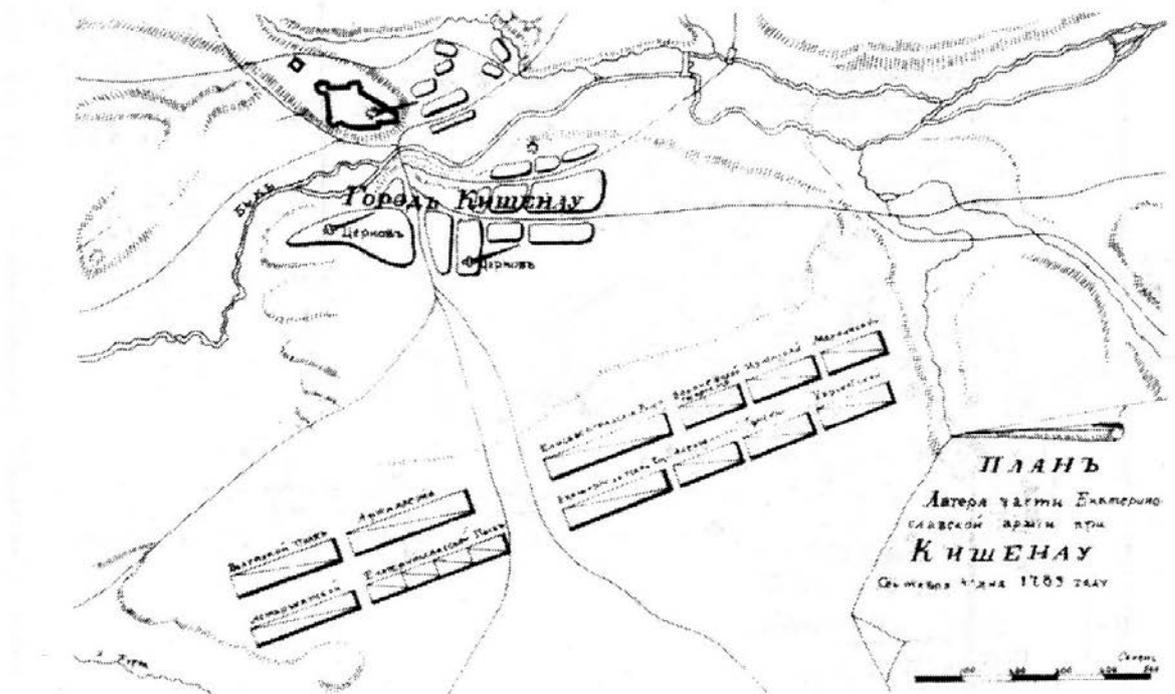
was officially recorded as a market town. This was because of the booths, which were bringing profits into the town as well as the presence of the big reign stalls, which also were indicating its status (Nesterov, 2010). Undoubtedly, the XVII-th century implied many qualitative transformations. It was the time when the settlement was promoted to the rank of a market town and even had an administrative system led by two heads. At its entrances, because of intense market activities (producing, selling and buying), were operating customs which were charging taxes for entrance. This kind of economic development made the town's households not needing the land around them which evolved into what is known as a city structure – with densely located buildings, one beside the other organised in streets (Sainciuc, 2014).

In 1739, Chisinau was burned down by the Turks, as a punishment after the Moldovans helped the Russians fight against the Ottoman Empire at the Hotin Fortress. However, the townsmen could benefit from that and installed their booths, pubs, stalls and else near to the Turkish *menzils* (post-roads) which contributed to the redevelopment of the town. A portion of this road exists until today under the name Petru Rares Street. In the past, it was known as the *Ulița Mare* (the big / main street). The advantages of Chisinau's location played an important role in its continuous development. Placed on a slight slope, oriented towards the Bîc river, gave the town a unique urban form. This, in ensemble with the main streets, oriented towards river's fords (because of the lack of bridges), conferred the town its street fabric and at the intersection of the two main roads took shape the Old Bazaar (Figure 8), which became the centre of the market town. Later, few churches and monasteries were built around the main square together with a few residential zones (Nesterov, 2010).



**Figure 8.** Caption of today's situation of the historical core of Chisinau with what remained from the medieval roads.  
Source: (Sainciuc, 2014:103)

However, the overall XVIII-th century was not that prosperous for Chisinau and for the entire region in general. The Moldovan land had to struggle in a difficult situation, given the fact that many wars happened on its territories in that period. The Tsarists and Turks were using this land just as battlefield, devastating it and burning everything on their way. Thus, in 1788, Chisinau suffered from another disastrous fire, which almost entirely burned down the town (Nesterov, 2010). A census from the '70s of the XVIII-th century showed a number of about 800 inhabitants in the market town. Their main activities were agriculture, handcrafting, trade, cattle breeding, fishing and hunting (Eremia, 1998). Şlapac states of an existing stratification of the population according to their occupation. This can be observed by studying the street names of that period. This way, we can see the following names: *Gradinarilor* (gardeners'), *Olarilor* (potters'), *Carierei* (quarry's) and else. There are present also the so-called colonists (Greeks, Armenians, Jews) whose main occupation was trading. Their location in the town can also be observed according to the street names or neighbourhoods. The stratification explains the two type of houses, made from wood and wall. The wooden houses were the countryside men's, just transposed into an urban context, whereas the wall houses were usually in 2-3 levels and were the property of the wealthiest. In light of common battles, the city was protected by the walls of the churches and monasteries and by developed underground ways network. At the end of the XVIII-th century on the maps can be observed a bastion formation built by the Tsarist military troupes (Figure 9) (Şlapac, 2008).



**Figure 9.** Map of Chisinau of 4 Sept 1789. Can be observed the bastion on the North-East of Chisinau and the Tsarist military troupes installed on the Western bank of the river Bic.  
Source: <http://oldchisinau.com/streets/oldmap/a-03-1789.jpg>

Some researchers argue, after a more detailed analysis of the maps of that period, that the position of the Tsarists military troupes on the Western bank of the river Bîc (as shown in the Figure 9) determined the future development of Chisinau. They state that the straight position of military camps served as reference for building the future main street of the city (today Stefan cel Mare Boulevard) (Nesterov, 2010).

In 1812, as a result of the Bucharest Peace Treaty, the entire Moldovan region in between the rivers Prut and Dniester was annexed by the Tsarist Russia and proclaimed a region of Tsarist Empire (Eremia, 1998). Later, comes the first attempt to 'regularise' the town with a systematisation plan realised in 1817. The plan divided the city into the Old (medieval) Town (in West known also as Downtown) and the New (rectangularly organised) Town (Upper Town) in the tradition of classical urbanism (Figure 10). On the plan can be clearly observed the old medieval market with a polygonal unorganised shape, due to the some transit roads. In addition, can be observed the old commercial street (Sf. Ilie) and some densely positioned residential zones. Clearly, a higher density was located around the old Bazaar. Here the buildings are densely located, in a continuous front (Şlapac, 2008).

In 1818, Chisinau officially obtains the status of a city. This when the central Tsarist administration names Chisinau the administrative centre of Bessarabia (name given to Moldova between the Rivers Prut and Dniester by the Tsarist Russia) (Eremia, 1998). However, this decision was well reasoned. It was not only that Chisinau was centrally located in the region, but also because the city, in the beginning of XIX-th

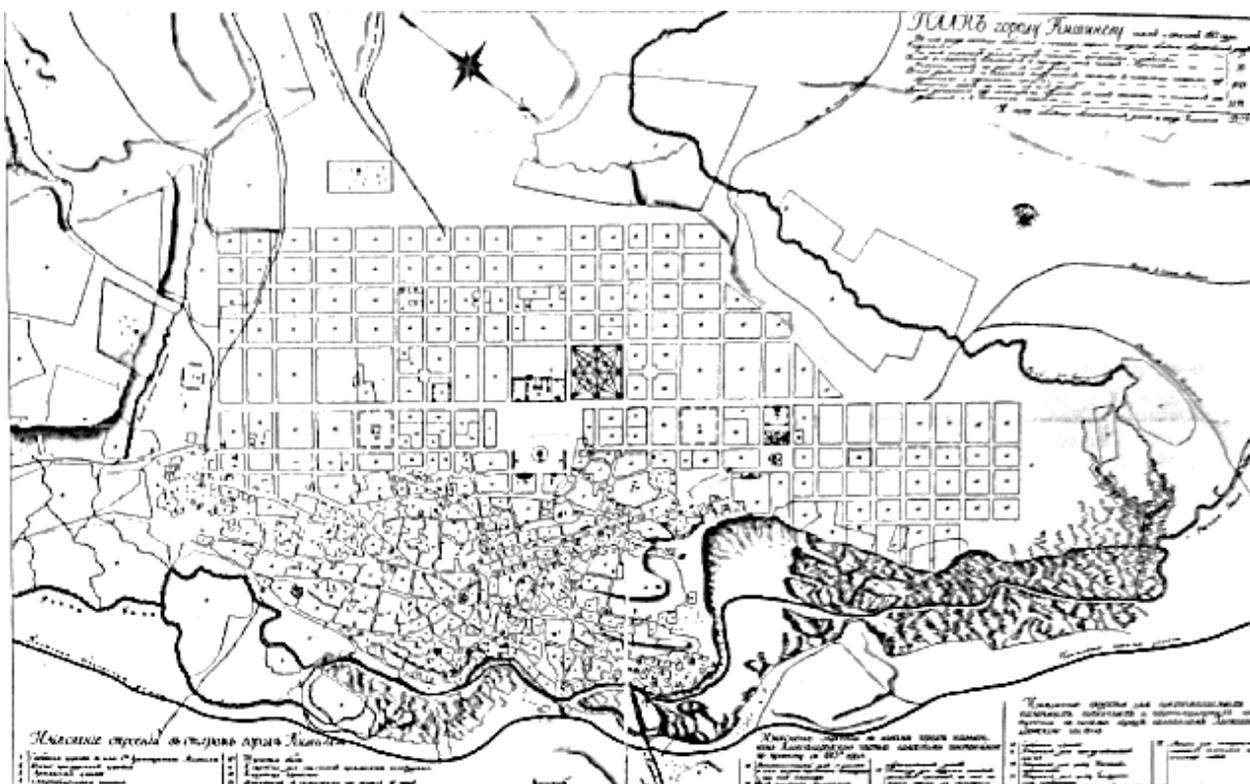


Figure 10. Chisinau systematisation plan of 1817  
Source: (Nesterov, 2010:14)

century was the most developed from the urban point of view. It had several markets, a commercial street, at least 7 churches, a logical street pattern and an impressive number of houses (approx. 300) (Şlapac, 2008).

Once Tsarist Russia installed its rule over Bessarabia, the region embarked on new developmental trajectory. The country was a region of the Tsarist Empire for about a century, from 1812 to 1918. Chisinau, in its turn, went through a series of transformations: physical, social, political, economic and ideological. An important aspect to be noted here is the town before Tsarists came and what kind of physical changes it suffered. This way, Sava describes it as a town, which embedded in it all the forms of the evolution of the civilisation, from the most basic countryside form until the most luxurious forms of the city. In this manner, despite the fact of Chisinau's importance, as a capital of a Tsarist region, the city was barely known in the Western society before the early XX-th century (Sava, 2011).

Nonetheless, this was not an impediment not to invest in, the already established as a city, Chisinau. After developing the systematisation plan of 1817, in 1825 was established a commission (*Construction Committee*) responsible for supervising, financing and supporting with building and labour forces the construction initiatives. In addition, new rules for building are received from the central authority in Moscow. Among them are listed such regulations as the width of for the new streets (which should not be less than 21 meters), the new plazas and streets cannot be located on low, waterlogged lands or on old cemeteries, also all the new industries should be located outside the city. Among others, the new authorities paid attention for assuring the transport mobility on the streets. In many cases, the roads were passing through old, agglomerated roads. If the governor was passing on some narrow street with some old, not looking good building, than he would give the order it to be demolished to which the owners had to conform and proceed with the execution of the command to make more room for the city the transport. However, the authorities' interest with ordering the streets (making them straighter) was not complemented with their paving or improving. In the following years (1829-1830) was realised a new developmental plan for the city. The plan was approved by the Russian Tsar Nicolai I in 1834 and sent back to Chisinau for implementation. Generally, speaking the new plan did not differ radically from the systematisation plan realised earlier in 1817 (Figure 10). It represented a classical organisation of the urban land, in tradition of the classical Russian urban planning. The plan divided the city in two parts, the Old and New. The new Upper City was organised in a grid pattern. In addition, the main street and the main square of the city were shifted to the New City. Because of this plan, many neighbourhoods and streets, from the medieval part, were erased and transformed in new development sites. This gives the impression of an illogic street pattern, as if the Old part was cut, while this is a consequence of the plan of 1834. During the following years, the grid of the upper city was filled with new constructions. A numbers of new administrative, socio-cultural and commercial institution were erected. Along with that, also, new churches are constructed, among which the main cathedral of the city with a bell tower in front of it. New

educational premises are established. By the end of the XIX-th century, the city was paved and a sewage systems, as well as street illumination (with gas lamps) were developed (however only in the main central part of the city). All these were implemented under the careful supervision of the main architect of the city, Alexander Bernardazzi. In addition, thanks to Bernardazzi's masterliness, Chisinau has gained its cityscapes (Şlapac, 2008; Sava, 2011).

Simultaneously, ideological influence of the Tsarist regime was not an option but a must. Immediately after the annexation of the region, many people immigrated to Romania, due to an instable political situation in the region and because of the fear not to be subjugated. In the fight between the two cultures: the old, Romanian, and new, Russian, the first one lost (Ciobanu, 1996; Şlapac, 2008). The Tsarist administration followed the path of changing the identity of the locals by merging the population with other ethnicities among which the main were Russians, Byelorussians, Ukrainians, Jews and else. This is confirmed by the Imperial census of 1897 (Sava, 2011). Also, as confirmation of a mixed population serve the names of the streets, among which are the Serbian, Turkish, Armenian, Bulgarian streets and else. As attraction of this massive immigration to Chisinau served the numerous incentives given to the colonists by the Tsarist administration (Şlapac, 2008).

Even with this major and intense urbanisation of Chisinau, for the period of a century, and in spite the fact that it was one of the important cities of the Tsarist Empire, the city still lagged behind the big European capitals, still maintaining a provincial look (Sava, 2011).

In 1918, a new, however short era begun for the city. On 27<sup>th</sup> of March, the freshly established (first) Parliament of Bessarabia declared its reunion with the Old Romanian Kingdom. This way, Chisinau as well as the whole Bessarabia embarked on integration, transformation and modernisation processes according to new rules of the newly re-established state, Romania (Țicu, 2011). A new general plan was developed for Chisinau in 1920 (Şlapac, 2008). However, it did not propose radical changes in the city's morphology if comparing it with the plan approved in 1834. The major struggle, though, was to bring back the Romanian ideology, which was lost under the Tsarist rule, specifically the forces were concentrated in the city of Chisinau, where changes were urgent. Here the majority of the population were speaking Russian and most of the street posters were in Russian as well. Therefore, a radical wave towards forgetting the past one hundred years had begun on several levels: administrative, political and cultural. The first step was changing the names of the streets. Then, was dissolved the city hall (*Duma*) and city council (*Uprava*) (Țicu, 2011). The most redoubtable change, as Țicu calls it, happened in the educational and cultural spheres. This, as he argues, served as an impulse for the re-establishing of the Romanian identity in the whole region, not only in Chisinau. New schools teaching according to the Romanian system were created, which were meant to diminish the influence of the Russian educational system. Also, on the cultural level the cultural policies had the role for strengthening the union of Bessarabia and Romania (Țicu, 2011).

What concerns architecture, it was also subjected to change. Nesterov states that new architectural styles were adopted for the region. The styles were inspired from the medieval architectural forms (*Neoromanian style*) or promoted by the supporters of functionalist style (*Romanian Modern style*). These were used for building churches, some buildings of social designation, residential and tenement houses, as well as urban villas (Nesterov, 2011a).

On the eve of the great changes caused by the World War II, Chisinau was a relatively agglomerated city, with a population close to 120 thousands. Its architecture was amalgamated, due to the overlap of the two major influences: Tsarist and Romanian. It also remained to be a multicultural city. However, it was a city where everyone could find its place and grow according to his / her educational or cultural beliefs (Țicu, 2011). At the same time, in terms of urban planning there were not many changes made, if comparing with the previous period when the city was extensively developed. The consequences of the crisis in Romania (and in the world) are also reasons of Chisinau's development inhibition. In addition, the lack of qualified planning specialists, well established planning documentation and reduced financial resources of the country had a negative impact over the further development of the city and the overall region in between Prut and Dniester (Șlapac, 2008).

The unfortunate events of the World War 2 made Moldova to be re-annexed by the Russians. This time, however, under a different ruling ideology – The Soviet Union. It happened in 1944 after the Soviet army troupes occupied Bessarabia (Eremia, 1998). Later in 1947, according to the Peace Treaty signed in Paris, Bessarabia was officially given to the Soviet Union (Șlapac, 2008).

The urbanism during soviet time evolved according to stages. (1) It was the period of reconstruction and rebuilding after the war (1944-1955), (2) the period of mass-construction on the free land based on the microrayon (micro-district) principle with using the functionalist architectural style (1955-1971) and (3) the time of creating the complex building and researching in 'soviet urbanism' (1971-1991) (Șlapac, 2008).

During the Second World War Chisinau was used as a battlefield two times, in 1941 and 1944. As a result, the city was destroyed on a proportion of 70%. Before the war, Chisinau had 820 thousands m<sup>2</sup> of housing stock, while in 1945 it remained with only 121 thousands (Nesterov, 2011b; Șlapac, 2008). During the first period of the 'soviet urbanism', the city, now the capital of the Moldovan Soviet Socialist Republic, started to be rebuild after a master plan was developed under the supervision of the notorious architect Alexei Sciussev (who gained his eminence during the Tsarist Empire) (Cașu, 2011; Nesterov, 2011b; Șlapac, 2008). The re-developmental plan, refined between 1945 and 1947, was approved in 1951 (Figure 11). It proposed a radical change in the city's morphology, especially in the old medieval part. Nesterov states that the idea was "to integrate, in a system with a homogenous architectural aspect, the parts that had taken shape under different historic conditions – the old, Moldovan part of the city with the new, Russian

part” (Nesterov, 2011b:137). With other words the plan sought to erase the street fabric of the medieval part, organically developed, or, as Şlapac puts it, to straighten some streets which were not in harmony with the overall plan (Şlapac, 2008). The road scheme was based on the ‘Baroque three-ray system’ (Şlapac, 2008) which was meant to connect the central square with key locations on the Eastern side of the river Bîc.



**Figure 11.** Chisinau Master Plan. Refined under the supervision of A. Şciusev. Approved in 1951.  
Source: (Şlapac, 2008:216)

At the focal point of the 'trident' was planned a new large road (boulevard), parallel with the longitudinal streets of the upper city (Nesterov, 2011b) (which, in fact, is the reason why I am writing this paper, but about that I talk more in detail in the next chapter). Therefore, the plan, which was supposed to revive the city, created, also, a range of problems. The reconstruction of the city entirely finishes around the mid XX-th century. The buildings, which were rebuild or reconstructed were chosen according to their past function. Thus, priority had the buildings, which corresponded with the past Russian period and had administrative or public functions. At the same time, the buildings, which represented the bourgeoisie were not taken into consideration (Nesterov, 2011b; Şlapac, 2008).

The 1950s marked the beginning of new city developmental trajectories as new tendencies in architecture were adopted. In 1955 is published the decision of the Main Communist Party Committee and the Soviet (Assembly) of Ministers of the USSR "*About the liquidation of excesses in design and construction*" (Kolotovkin et al., 1987). This document put an end to all the extravagances in decoration (outside and inside) of the buildings and started the era of standardised mass construction using prefabricated materials (mainly concrete). The decision comes about twenty years later after the Fourth Congress of the International Association of Architects took place in Athens and fourteen years after Le Corbusier publishes the *Athens Charter*, in 1941 (written in accordance with the decisions taken at the Congress). The document that puts the basis of the modern urbanism, which follows the principle of building standardisations and exterior aspect simplification, also mechanisation of the production processes (Şlapac, 2008). Additionally, the decision comes at the right time. The Regime at that period was facing severe housing shortages and to meet the demand was needed a system which is (relatively) simple and fast to build, also which does not cost too much.

This way, in Chisinau were planned and developed new neighbourhoods, which followed the newly established construction principles. The so called *dormitory neighbourhoods* were the product of the segregationist regulations which stated that the living areas should be located separated, but near of the production and industrial zones (so that workers do not have to travel far). The *dormitory neighbourhoods* were organised in microrayons (the novelty of the Union), which represented a set of blocks of flats with all the commercial and socio-cultural services located at a walking distance, usually inside the

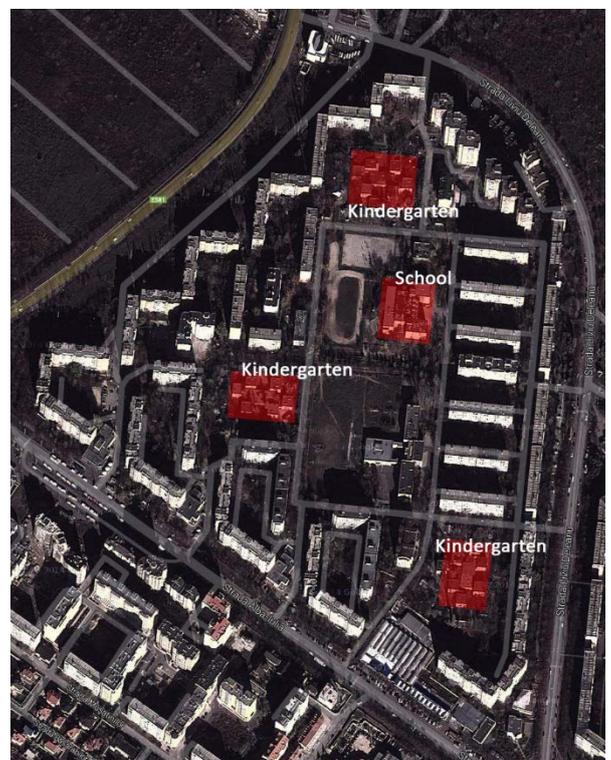


Figure 12. Microrayon (Chisinau, Buiucani district) with such facilities as schools and kindergartens. Also, inner courtyards in between the blocks of flats.  
Source: maps.google.com

microrayon (Figure 12). The buildings are built according to prototype projects with a structure made of prefabricated materials. The density of these types of neighbourhood patterns was reached by building relatively high raised blocks of about 9-10 storeys. The Idea behind these kind of arrangements was to promote a collective living space and to share all the city territories. The microrayons are arranged in groups, which form neighbourhoods. The major transport arteries do not cut through the microrayons but from them are organised local access ways (Şlapac, 2008). Simultaneously with the development of the new neighbourhoods, urban planners were concerned about the city centre too. Thus, they propose similar developments and re-systematisation in microrayons of both upper (Russian) and medieval city centre parts<sup>26</sup>.

An important aspect to be mentioned here is that the planning activities of that time were controlled by the state (Şlapac, 2008) as well as everything else in the country. One scope of the Communist regime was to build a new society to be devoted to the regime. A new society, as understood, cannot be created when its people have a past and have means to connect or relate to it. One of the obvious ways to relate to the past and the ancestors are the physical manifestations of it – the buildings and monuments. This way, the Central Committee of the USSR was using urban planners and architects as tools for eradicating the past through changing city morphology and its old structures by changing them with the new ones in conformity with the soviet rule. Chisinau, with its history is a real example of that.

Soviet planners were also developing the city in terms of transportation accesses. In the '60s were already rebuilt or improved a number of access roads to the city. These roads were connecting the city with other important urban centres of the region and outside it. Were made plans for future constructions of new arteries for transiting the city, but bypassing its central part (Kolotovkin et al., 1987).

During the Soviet Union era, there were to be developed two more master plans. After the plan of 1951, a new one was approved, driven by the intensively growing city and its population, in 1969 (n.d., 1984). The new plan was based on a feasibility study approved in 1965. The study forecasted an increase in population up to 500 thousands in the next 15 years, people which were planned to be housed in four districts: *Rascani*, *Botanica*, *Buiucani* and in the *Centre*. At the same time, the study's author, the architect R. Kurts, proposed a preservation of another 350 ha, at the outskirts of the city, which in case if needed, would serve as home for another 90 thousands people. It also, proposed the demolition of a certain part

---

<sup>26</sup> In 1966, the "Gosstroj" (The State Construction Committee) of the USSR together with the "Gosstroj" of SSRM and Architects' Union of USSR launched a competition, which aimed the redevelopment of Chisinau's city centre. The winners of the contest proposed a plan based on two main axes: the main boulevard of Chisinau (today Stefan cel Mare) and the 'central ray' (today Grigore Vieru bd.) of the earlier proposed 'trident' of Şciusev's team in 1947. It was, also, planned that the riparian area to be improved for socio-cultural and sports activities. Thus the territory to be redeveloped occupied a surface of 1000 ha (Kolotovkin et al., 1987).

Earlier was done another experimental project, but only concentrated in the medieval city, which had an intervention surface not bigger than 80 ha. This project also proposed a re-systematisation of the region in form of microrayons with premises of public and socio-cultural interests (Şlapac, 2008).

of the city centre (300 ha), “of the low-value adobe constructions”, which eventually would host another site for housing development. In the study were also proposed significant improvements in city’s infrastructures. However, the state committee, which put the study in discussions, highly criticized it for not valorising city’s unique landscape (Chisinau being situated on 7 hills). They pointed out the need for creating an identity for Chisinau, which would highlight the city’s uniqueness, different from other cities in the South (South of USSR). One proposal was to install a dam on the rather small river and thus create an interesting green promenade. Also, were disapproved the monotonous planning patterns of the new microrayons. Here was also mentioned the city’s remarkable relief and was called for a revised planning perspectives in order to reveal city’s personality. Nonetheless, the state committee approved the feasibility study, which later dictated the new master plan (ATEM, 1965). A news in the master plan of 1969 (Figure 13), as Şlapac points out, are the two pedestrian streets, passing through the city centre, that connect two green spaces: the area around the river and the park located in the upper part of the centre (Şlapac, 2008). These streets (if they were built), Şlapac argues, would destroy the medieval street fabric, not mentioning the demolishing of a range of architectural monuments (Şlapac, 2008).

In general, the period between 1955 and 1970 were years of intense urbanisation of the Moldovan Soviet Socialist Republic. The percentage of population which changed (or was forced to) the rural life on urban increased from 13% at the end of ‘40s to 45% by ‘70s. the numbers are for the entire MSSR (Şlapac, 2008).



*Figure 13. The master plan of 1968. Authors R. Kurts and S. Shoikhet, architects.  
Source: (Şlapac, 2008:228)*

As stated earlier in the text, there were three phases of urbanism in USSR. The last one was the one of research and search in the field. In this phase are made attempts to shift to a more attractive mass urbanism and leave the monotonous planning patterns behind. However, the main resistance comes from the budget, which does not allow for big expenses when it comes to architecture. Therefore, more significance is given for the important state, public and cultural buildings, which are designed with a more personalised and unique style.

This research stage is characterised by the search for the city developed around the 'social man'. Şlapac argues about the principle named "humanopolis", which puts in the centre the working man (Şlapac, 2008). It is the working man that holds the Union together and assuring his multifaceted well-being represents a primary aim of the socialist economy. This in conditions when the society's life is driven by the five-years plans and, thus assuring a budget which would solve in short terms various urban activities (Şlapac, 2008). In the context when every aspect of life is controlled by the state, the general belief is that there are no sudden urban population increases, but the growth is rather planned. These increases are projected in master plans and that is why an essential attention was paid to creating them. The assumption was that through the plan everything could be controlled, predicted and supervised. Because regime's ideology was to create the 'new (socialist) man', all the changes in the city morphology were done for building the 'ideal city' in which he would live and create the 'new (socialist) society'. That is why the socialist city was considered superior to the capitalist one (Şlapac, 2008).

The draft plan of Chisinau, realised in 1984 was based on developing the city linearly, directed by the position of the river. The presence of the green spaces has an important place on the plan, with many parks and green leisure zones. What draws attention are the two high-speed large roads parallel with the main Lenin Boulevard (today Stefan cel Mare), upper and lower from it. One passes through the upper city centre (today Bucuresti Street) and the other cuts through the lower medieval centre (which is the extension of the Cantemir Boulevard, the case study and research question of this paper). Later in the master plan of 1989 (Figure 14), can be observed that the idea was not abandoned, but more accentuated, even with the risk that the Cantemir Boulevard will destroy the medieval, organically developed street fabric and will demolish a number of architectural monuments (Şlapac, 2008). This also is in contradiction with the decision of the Ministry of Culture, which declared Chisinau and a few other cities in MSSR historical cities of the Soviet Union. Even more, in the same year Chisinau city council confirmed the boundaries of the historical city, which coincides with the perimeter of both upper and lower city centres (Nesterov, 2010).



*Figure 14. Chişinău Master Plan, 1989  
Source: (Şlapac, 2008:229)*

Nonetheless, in spite of all the negativities, the city of Chişinău had known an incredible growth, both physically and population wise, under the Soviet rule. The achievements in terms of urban development accomplished in the period between 1944 and 1991 are undeniable, at least quantitative wise.

In 1991, Republic of Moldova declared its independence. The state, which was subjugated until now, finally brought the democracy to the country. Together with that, new achievements were to be accomplished and the life was supposed to take another turn and rapidly improve. At the same time a new era begun for the Moldovan urbanism.

However, the changes let themselves to be awaited. In light of the events of the beginning of the '90s, the country was in crisis, given the fact that the economy of which once it was part of fell apart. The production radically decreased as well as the life quality. A major strike was, also, the military conflict of 1992, which put the country in an even more difficult position. There were no developmental strategies in adapted for the liberal market and the international loans did not improve, nor much helped in this situation.

In these conditions, planners had to adapt to the new situation and seek for optimal solutions. The shift from the state property to private property changed the perspectives over planning. In addition, the decisions are not centrally taken and, what is more important, neither there is a centrally allotted budgeted

for planning purposes. In help for redressing this complicated situation the central government adopted a number of laws which would improve the planning policies and set a framework in the country (Şlapac, 2008).

In the meanwhile, the situation in Chisinau is worsening day after day. The division of the people according to their economic possibilities becomes more and more visible. This way, started to appear neighbourhoods (of urban villas) which mainly are inhabited by the rich of the society. At the same time, an uncontrolled development of the city is taking place and the authorities cannot manage to deal with them because of the legislative gaps. Some changes begun to happen from the early 2000s, when the government issues a document aimed at equipping the cities with new urban planning documentation. In 2003 with the support of UNDP and several other international organisations, Chisinau's planning authorities realised the Urban Planning Concept for the Development of the Chisinau's Municipality. It is forecasted a population increase to 1 million. On the transportation scheme appears a ring road around the city. Also are previewed new strategies for the conservation of the historical city centre. The last master plan, approved in 2007 was also realized with the support of the UNDP. For the realisation of the project were engaged several local and international planning organisations. The final plan proposed a series of improvements for the city. In terms of transportation it mainly followed the previous plan of 1989, but in addition to a one ring road prosed in '89, the new plan projects additionally two more. This would resolve the problem with the transiting traffic. In the city centre are proposed a range of solutions for diminishing its congestion level, by enlarging some streets. There are proposals, also, for improving the inner courtyards in the centre and proposals for new high raise buildings of 16, 18 and even 33 levels. At the same time, the plan does not solve a number of already 'historical' problems left from the previous master plans (Şlapac, 2008). It starts with the extension with the Cantemir Boulevard cutting through the medieval core. An idea, which does not represent a solution for improving the urban traffic any more. A country, which aligns to western society's developmental principles, still intends to realise an idea, which anyway is outdated. Also, the new plan lacks a strategy and a regulatory framework which would preserve the historical core from interventions that can irreversibly affect or destroy it (Şlapac, 2008). Nevertheless, the existence of this plan is a step forward and the first of its kind realised in conditions of a liberal market for Chisinau. It was approved in 2007 by the city council.

Today, Chisinau is divided into 5 main districts (Centru, Buiucani, Botanica, Rascani and Ciocana), each with its own administrative unit that is subordinated to general mayoralty. The districts are located around Chisinau's physical (historical) centre. Each district has a main street (boulevard) and every district is a small city within the bigger one with developed infrastructure systems and with all the facilities necessary life. It is worth mentioning that the green zones (parks and forests) in between the districts, in a way slice Chisinau into 'little cities' what makes it, as some say, "the greenest capital of Europe".

## II. CANTERMIR BOULEVARD ANALISYS

### A. What means Cantemir Boulevard?

In the next lines, I will talk more in detail about the case study of this paper, Cantemir Boulevard, and explain more extensively the issues behind it. This should result into a comprehensive overview on the topic, at the same time this being a step forward towards answering the proposed research question whether **Will the Cantemir Boulevard reduce the traffic congestion in the city centre of Chisinau?**

As seen from the previous chapter, Chisinau throughout its lifespan did not have an easy path. This, however, is understandable given the fact of its importance for the country, Chisinau having for the last, almost 600 years the status of the main city of the region, guberniya, soviet republic and finally, independent republic. Today the city, as well as the entire country, has oriented its developmental strategies towards aligning them with those from the West, more precisely EU.

As the country was jumping from under one rule to another, the same happened with the Cantemir Boulevard. Before that, let us start with a small definition of what a boulevard is and what it is meant by Cantemir Boulevard. The word *boulevard* has its origins from French, which definition is: “*Large voie de communication urbaine plantée d'arbres*” (Larousse, n.d.). In translation, it is a large urban street planted with trees. The Oxford Dictionaries describes a *boulevard* as “*a wide street in a town or city, typically one lined with trees*” (Oxford Dictionaries, n.d.). The Moldovan normative, NCM B.01.01 – 2005, defines a boulevard as “*an urban thoroughfare of high traffic that assures both transport’s and pedestrians’ mobility and is planted, usually, on the edges with trees*” (ARDRM, 2005:3)<sup>27</sup>. This, in the end, is the definition to which I am referring in this paper. The word ‘thoroughfare’ plays an illustrative role here, as the shortest connecting way between two destinations. *Cantemir* is the surname of a Moldovan prince, Dimitrie Cantemir, 1693, 1710-1711, which has no special meaning in this specific paper and represents just the name of this large street. This boulevard, as I mentioned earlier in the text, if it is to be put into life, will pass through the medieval core of Chisinau. Thus it will destroy the city’s old street fabric and demolish a range of architectural monuments of national and local importance and, what is not lesser important, it will bulldoze residential zones with consequential eviction of the people living there.

The first time the idea of building the boulevard appeared in the plan of 1947, proposed by the team of architects working under the careful direction of Alexei Şciusev (Figure 11, p. 36). However, the overall idea was not just to draw the boulevard through the medieval core of Chisinau, but, more, it sought to fade the two differently developed parts of the city (the new upper and the old medieval) into each other,

---

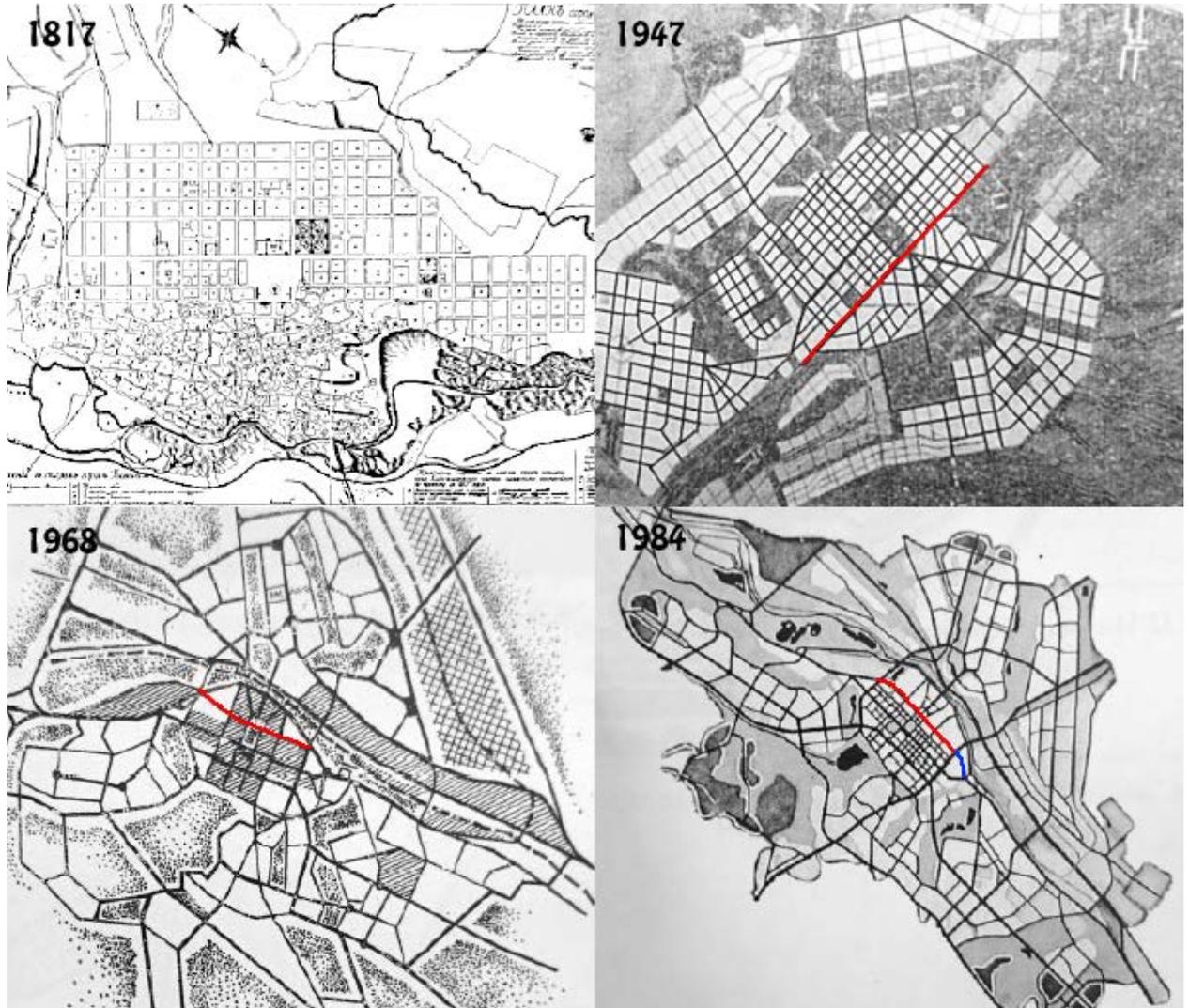
<sup>27</sup> Agency for Regional Development of the Republic of Moldova

thus creating an impression of a naturally developed structure (Nesterov, 2011b). The integration of the city's parts was to be realised through a sequence of significant interventions in the streets' morphology of the city (especially in the lower city). This way, a major role in realising the plan played the 'three-ray' model – mobility arteries, in tradition of the baroque style. The idea for these three key roads was to influence the further development of the city towards the Eastern river side of Bîc (Şlapac, 2008). However, if realised, the plan would demolish, easily, a half of the lower city. The central ray of the 'trident' cut through the Old bazaar. Also, by tracing these three roads was created a disruption of the medieval city and visually diminished its urban space with old national style buildings (Şlapac, 2008). The intention of the plan was very ambitious. The decision for this kind of redevelopment was also influenced by the situation of the city at that time. Being devastated by the war this kind of city redevelopment seemed the most appropriate. It also was a good opportunity for building a new city for the new socialist man. In Western Europe, however, the cities that were affected by the unmerciful war had known different reconstruction decisions – here the decision was to rebuild the historical cores by preserving the city's roots and identity. Today, the life quality in these cities is increasing and their economies are flourishing.

Ultimately, the 'trident' plan was realised only partially with only being built the central boulevard of it. However, it did not have a lesser impact and, consequently, the city lost a big part of its medieval area, together with the old bazaar and a number of important religious structures (churches and administrative buildings).

The idea of the 'three-ray' (in the form that it was proposed) was abandoned, already, in the next 1968 master plan of Chisinau. At the same time, in the next plans can be observed a street pattern that reminds the initial proposal, but which does not completely follow the 'trident' shape. One aspect if it that was not abandoned was the wide street at its basis – today the Cantemir Boulevard (Figure 15). It is difficult to judge what the scope of this boulevard was, considering that it was transferred from one master plan to another until nowadays. One clear aspect is that at that time the medieval core was not of an apparent importance in order to be protected, thus the planners and architects were inclined to get rid of it. Mostly because after the war it was in a very bad shape, then it reminded more of a rural settlement than it was a city. To that can be added the fact that the politics of the Soviet Union was to urbanise massively the country and there was no place for rurality, especially, in a capital city.

As the time was passing and the city growing, the motivation behind the boulevard was also changing. This way, the master plan of 1989 motivates the need for the boulevard for improving the accessibility and traffic fluidisation of the centre, as the city population is predicted to grow, by the year 2000, up 1 million inhabitants. This would make more room for the cars, which were believed that also will be increasing, and would unload the main streets from traffic. The proposal is backed-up with an extensive



*Figure 15. An overview on how Chişinău's structure changed during the last 100 years. Marked with red is the Cantemir Boulevard in different master plans of the last century; with blue is marked the part of it that is build, but it is outside of the historical centre. Collage by the author. Sources: (Nesterov, 2010; Şlapac, 2008)*

analysis of the road network and traffic data. The analysis showed continuously increasing car numbers and agglomerating road network, especially in the central region of the city. Thus, the way to solve these problems was seen by increasing roads' carrying capacity and through building new arteries, among which was also the Cantemir Boulevard (I.M. Chişinăuproiect, 1990). It is easier to propose than to implement.

Consequently, the proposals in the latest master plan, of 2007, did not change and the idea of cutting a large boulevard through the centre persists. Mainly it is because on the new plan worked the same people with, basically, the same knowledge, which elaborated the master plan of 1989 (INCP Urbanproiect et al., 2006). In other words, the system has changed but the means to operate it remained to be the same. This means that the reasons on which the proposal is based also remained to be the old ones: increasing car numbers and insufficient carrying capacity of the road network. The solution, of course, is obvious and it is the easiest (at least to propose). The proposals are difficult to change when the responses for the problem are 'obvious'. That is why it is difficult to look for other kind of solutions (Figure 16).



**Figure 16.** The red lines of the roads (which correspond with the master plan) in Chişinău city centre. Can be seen the finished part of Cantemir Boulevard and the part which is supposed to cut through the old city centre.  
Source: [map.chisinau.md](http://map.chisinau.md)

The area, through which the boulevard is supposed to be built, as it was many times stated before, is the historical centre of Chisinau, which is protected by law. The first attempt to register the centre as historical value was made in 1986, when Chisinau, through a decision of the Ministry of Culture of the time, was included in the list of historical cities of the Soviet Union. Its historical limits were confirmed later by the city administration, which coincide with the area between the streets (contemporary names): *Alexe Mateevici, Mihai Viteazul, Albişoara and Ciuflea Streets* (Nesterov, 2010). On general basis, it matches today's limits of the historical centre of the city. In 1993, the Parliament of the, already, independent Republic of Moldova adopts a law (nr. 1530, from 22.06.1993) concerning *Monuments' Preservation* that put under legal protection a vast number of monuments (cultural, archaeological, architectural and else) all over the country. Among these, in Chisinau are located over 950 units of architectural monuments of local (city) and national importance. Later, in 1995, Chisinau's city council adopts another document, *The Register of Monuments of Local and National Importance*, in which are registered over 250 architectural monuments of national importance and more than 700 of local importance. This makes Chisinau the biggest concentration of heritage monuments in the country. This easily draws a picture of the historical-architectural importance of the central part of Chisinau, which occupies an area of 619 ha and makes a little more than one historical valuable building per hectare.

The Cantemir Boulevard, whose red lines can be seen in the Figure 16, passes through the historical centre that is protected by national and municipal laws. Besides that, a study, which was realised in the frames of the General Master Plan of Chisinau of 2007, shows number of nine laws that by building the Boulevard will be broken (Miron, 2007). The same study shows an amount of about 20 monuments that will have to be erased as consequence of building the boulevard<sup>28</sup>. Among that should be counted about 130 private houses to be demolished and 400 families to be relocated. The estimated cost for constructing the Boulevard varies between 100 and 300 million Euro, however, the precise sum is not known (Miron, 2007). The city authorities note that the most expensive part of this project is relocating the people living in the area and proposing them new housing places (Boldesco, 2015).

Apart from its historical value, the medieval core has social and physical assets, which are yet to be appreciated. The area is of great importance for the people that are living there. Many of them have an emotional attachment to the place, having spent their entire lives there. From the social point of view, this makes the region emotionally charged, whose importance, at least for those living there, is of enormous value.

At the same time, the natural evolution of the street fabric with its narrow streets, which gives the impression of an uncontrolled development, accentuates the uniqueness of the place, unseen anywhere else in a city, which mostly is made of straight streets, forming, almost, straight squares. This exclusive

---

<sup>28</sup> See in Annex 1 the list of some architectural monuments, which will have to be pulled down.

personality of the medieval core is of great potential for both inhabitants and visitors of the city. It represents literally the heart of the city and it is the best place to get the feel of the regional city building and development.

As it is well understood from the previous paragraphs, if it is to be built the Cantemir Boulevard will affect tremendously the morphology of the lower city centre of Chisinau. An approximate forecast can be deducted from Figure 16. This way an impressive amount of streets will disappear from the city's maps (*Avram Iancu, Bălănescu, Octavian Goga, Cosmonauţilor, Căpriană and Ivan Zaikin Streets*), while other will suffer partial demolitions or their shape will be changed completely (*Cojocarilor, Bălţi, Sf. Andrei*).

The consequences of such intervention in Chisinau's centre will permanently affect not just the area, but it will have an impact over the entire city. The area has already suffered and is in continuous degradation, because of the restrictions imposed by the red lines of this wide street. This means that since the first master plan was adopted with a proposal to build the Cantemir Boulevard, the sector through which it passes was conserved and no further capital development along the road's axis was allowed. Or else, the city hall was not issuing any building authorisations (or, at least, it should not). More, the zone was marked as for redevelopment and all the constructions were planned to be pulled down, as the boulevard would start to be built. This meaning that the state would not afford to demolish new constructions or improved people's houses, which, ultimately, will add to the general cost. So, if anyone would want to rebuild or build new things around his household he was not allowed. In addition, if anyone's house happened to be in a bad shape, for different reasons, he was powerless, because of the regulations imposed by the lines. The boulevard has a length of about 3 km and a width (in-between the red lines) of 70 m (Figure 17). A simple arithmetical calculation gives us an area of about 21 ha, which makes a huge number for a city. This way, since, already, more than 40 years the land in-between the red lines of the boulevard is in constant degradation. In other words, the restrictions are in power until today, which puts the people in a difficult situation. During the Soviet rule, the people living here were at peace with the idea of having restrictions. They knew that the state is taking care of them (or it has the capacity to do so) and when the time would come, they would be given new homes, in newly built flats. More, these people would be thankful because they would have new houses instead of the old, bad-shaped and un-serviced ones (Ilanovici, 2014). Until the collapse of the Soviet Union these inhabitants had hopes that soon they will be relocated to new, modern houses. However, after the regime of the Soviet Union fell, the country adopted a market driven development in which the private property is protected by the law. The country, whose properties once were collectively owned and centrally administrated by the state, was now divided in properties owned privately. The provincial look of the medieval centre of Chisinau somehow resisted through time until present days. The buildings are in one level organised in clusters or solely located on individual parcels. After independence, the residents started privatising their houses and

the adjacent to them lands, this way reclaiming their constitutional rights. Thus, today, a big part of the lower centre is divided in private properties. In the '90s, right after the independence, the country was in crisis. These were political, economic and social crises. Because of the unstable situation and conditions when the state is not able to follow everything that is happening in the country, the people saw the need to take care of themselves and their properties. They understood that in circumstances of a liberal market, the state would not be able to provide them with houses anymore. Thus, due to the lack of monitoring and controlling mechanisms and imperfect legislation, the people were encouraged to act informally. This resulted in informal activities like bribing the officials for getting a construction permit or building, in general, not obeying any rules. Therefore, the area that legally is protected against any capital developments is informally flourishing. Today the region along the Cantemir Boulevard's axis is in extremely bad shape not only because of the falling to pieces buildings, but also because of the unregulated (informal) development. At the same time, if some people managed, in a way or another, to rebuild their old houses or build new ones, others could not afford that and are still living in underdeveloped conditions, in their ruining homes. An interesting reportage was realised by those from Europa Liberă (The Free / Independent Europe) entitled *"In the capital like in the countryside"*. Here they talk about the sad condition to which the capital Chisinau was led to by the plan to build the Boulevard and the miserable conditions that many people have to live in because of it (Ivanovici, 2014). Another reaction to the red lines (known from informal sources, however) are the informal property businesses. Private 'investors' or organisations are looking to buy properties in the area (because of their high financial value), knowing that the prices would go up if, by any chance, the boulevard will be built.

These are only a few consequences of a Boulevard, which once was motivated by an ideological idea of building the perfect socialist city for the socialist man, but which still is eagerly promoted today by the democratic forces.

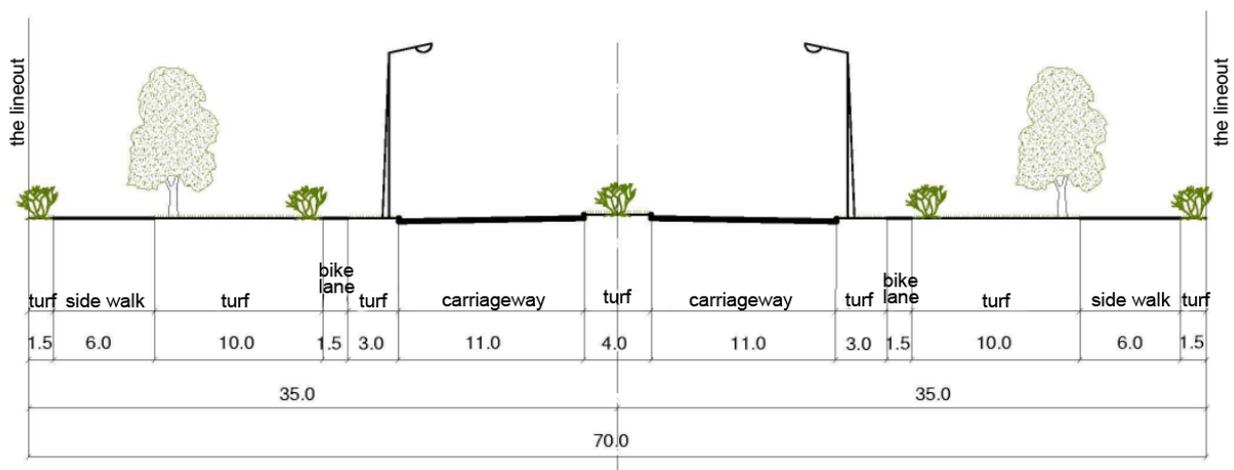


Figure 17. The transversal section of the Cantemir Boulevard.  
Source: (INCP Urbanproiect et al., 2006)

## B. Research methodology

In this chapter, I will talk about the research methodology that was used to answer the research question of this thesis. I will elaborate on the means that were chosen for basing the arguments on and will explain, generally, how the process progressed: where it started and where it is aimed to reach.

The research is conducted to study the transportation and mobility aspects in Chisinau, Moldova. The aim of the research is to answer the proposed research question: ***Will the Cantemir Boulevard reduce the traffic congestion in the city centre of Chisinau?*** For answering this question were used a variety of methods. The number of these methods is explained by the fact that the more informational sources are being used, the more objective and neutral the arguments and the conclusion are. The manifold informational sources utilised for this study can be enumerated as follows: an extensive literature review of academic articles, books, newspaper articles and videos; statistical data analysis from governmental institutions; analyses of maps and developmental plans; normative documents and interview with the authorities also, survey through questionnaires. Theoretically, this extensive research can be combined in *qualitative* and *quantitative* data. The two types of data are broadly discussed and theorised in the academic world<sup>29</sup>. The basic understanding of the two data types lies in the differences between them. Under the category *qualitative* are placed the data that cannot be measured. Here are included the all the journal articles, books normative documents and so on. While the *quantitative* data is the information that can be counted. These, for instance, are statistical data (like population and car numbers) and surveys through questionnaires. The topic concerning the dichotomy between the two research strategies is on debate since '80s of the last century (Newman and Benz, 1998). However, Neman and Benz are denying any 'superiority' of one over the other. The authors argue that the approaches do not exclude, nor they can substitute each other (Newman and Benz, 1998). In other words, their importance for research is vital and the choice between them is a matter of a research approach.

The idea behind the topic of this thesis is a result of four years of professional experience since I graduated from the Technical University of Moldova. Two of these years, I spent working with an NGO that was dealing with continuously degrading public spaces in Chisinau. This organisation in 2012 organised a mapping workshop in Chisinau. The name of it was "Mapping of Public Space in Chisinau" (Us, 2012). The purpose of the workshop was to establish the basis for a long-term action plan, which would enable the identification, recovery and re-use of public spaces in Chişinău, which would offer them a strong civic character. During the workshop was elaborated a form (called '*the location sheet*') for evaluation of the public spaces. In addition, after long discussions were identified a range of public spaces

---

<sup>29</sup> An extensive theoretical analysis on what the Research Methodology, with extended explanations of the various approaches to research, is put together in the works of (Denscombe, 2003; Kothari, 2004; Newman and Benz, 1998; Singh, 2006).

to be evaluated by the participants of the workshop after the actual workshop was over. These spaces are located along the Cantemir Boulevard's axis. The mapping workshop put the bases of a wider initiative, whose purpose was, through a series of residences, a reading group along with an online library and a publication, to educate the young professionals in order for them to gain new competences and widen their professional horizons. Further, the initiative aimed at raising awareness of the local public authorities towards "the need to recover, protect and develop the public spaces in Chisinau" (Us, 2012).

In the second year of my experience with Oberliht, as a follow up activity after the mapping workshop of 2012, was organised another project of a larger scale under the name "CHISINAU CIVIC CENTER – beyond the red lines" (Us, 2013), which further contributed to my better understandings of the Cantemir Boulevard issue. The intention of this project, with a very revealing title (of course are meant the red lined of the Cantemir Boulevard), was to study and understand a range of important issues that Chisinau is facing today. Among them are questioned the new master plans and how are they developed; how public money are being spent on public projects (and do they meet the needs of the citizens), ultimately, what are the alternatives for a capital city, which still promotes a development based on private automobile ownership before a public transportation system, luxury residential zones before social ones together with a range of other not less important questions. The project was realised through a residency program with invited artists and architects to contribute to and organise a series of interventions with the participation of the inhabitants of Chişinău, in areas where the Cantemir Boulevard was planned to be built, but never was (Us, 2013).

The following two years of my professional experience happened far away from home, in an International Master's Programme, which combines professionals from all over the world, brought together in a class, in a foreign country, to contribute with their knowledge and experiences for studying Urban Development. The first year of Mundus Urbano Programme and the various workshops broadened my scope of understanding of the urban planning realities in different parts of the world. It also widened my academic perspective on the gap between the theory and actualities. During the second year of the master's, I started to look closer into transportation planning in city development issues. The reality is that the two are very closely connected. This means that the way an urban road network is defined, the same way the city will develop. Since already 100 years, the urban developmental patterns depend widely on roads and the way they interconnect with the built architectural environment. This, in consequence, changed the shape of the city with the key developmental component being the automobile. Being a part of this international young professional's programme, amalgamated with the years of practical and theoretical experience of its professors, gave me the opportunity to look at issues through the manifold international perspectives. Furthermore, the various literature (these are journal articles, books, essays and else) that were proposed for studying showed an approach to theory and practice unknown to me before.

All these, in the end, served, inspired or, even, pushed me for deciding on the topic of this thesis. On top and above that, Chisinau is my home city – a place very dear to me. Seeing how it is being destroyed in such way let me no other choices than writing this paper.

The structure of the thesis consists of three sections: Introduction, Cantemir Boulevard Analysis and Conclusion. The first part is divided, respectively, into another three parts. They state shortly the Research Question, elaborate on the Literature Review and give a short history of Chisinau, correspondingly.

I started this thesis with an extensive literature review of all kind of available informational sources I considered relevant. The Literature Review part consists of over 50 references of articles of academic journals, books, newspapers, internet pages, video materials and more. The scope of the Literature Review part is to show the general debate in the academic and professional world concerning the transportation field. These, therefore, are the old and new tendencies in transportation planning and development. As well, I tackle environmental aspects in general discussion. It starts with a short introduction into history of the automobile. The main accent being put on how the automobile influenced the city development and, more important, how it changed its inhabitants' behaviour and attitudes towards the city's built environment. Further, the text goes on to analysing how the society became car-dependent and what are the repercussions of that over the day-by-day life of both car-dependent ones and who are not. In the next paragraphs, I examine the paradigm shift in transportation, what are its scopes and prerogatives. The discussion is about a change in transportation habits, adoption of more sustainable mobility modes, as well as giving more importance to city pedestrianisation and accessibility of the city on foot, improved public transport, diminishing CO<sub>2</sub> emissions and else. The shift being from a highly intense 'automobilised' society towards systems of mass transit, ecologically clean, and diminishing the trip lengths. Finally, I write about the new perspectives for transportation development and how large international organisms, like European Union, are working on meeting the proposed results. One of the concept which largely being accepted and adopted by the big and small cities is the *Transit Oriented Development*. Its aim is to assure the population with an effective, reliable and comfortable transportation system that would respond to the needs of everyone, at the same time it being environmentally friendly.

The last part of the first section is a short history Chisinau. Here the emphasis is made on the developmental stages of the city since it was a small settlement until present days the capital of Republic of Moldova. As stated, this part gives a good overview of the city and contributes to a better understanding of its issues today.

In the next, second, section I talk about what, actually, Cantemir Boulevard means and elaborate widely on the problem of this boulevard, explaining in-depth the situation around it. This part starts with the history behind the idea of building this boulevard, which lasted more than 40 years. Then, I explain how

the developmental plan of Chisinau changed from one master plan to another and how the boulevard was in each and every of them. Further, I write about the area through which the boulevard is supposed to cut and describe its value for the city and its citizens. Ultimately, I speak about an eventual change in the city morphology, in case the boulevard will start to be built, and make an analysis of the consequences of such a plan.

Following are the sections of the Research Methodology, Data Analysis and Research limitation. The names of these sections give a good understanding of their content. In short, the Research Methodology explains how I went around deciding on the topic of the thesis, how it is structured and the methodological tactics used for answering the research question. The Data analysis interprets the results of the sociological survey, which was done to study, in situ, the problem of the Cantemir Boulevard. While, the Research Limitations talks about the research limitation, which impeded the study for generating a more thorough conclusion.

Lastly, the Conclusion part, as it is understood talks about the outcomes of the overall research and answers the research question. In addition, it proposes alternatives for the boulevard in light of the international experiences.

This kind of approach in organising the thesis' outline gave me a control over the reading and writing progress and allowed me to follow the proposed structure and not deviate from the main ideas of the text. Besides, that I think is very important to the reader, the flow of the text is easy to read and understand.

As a part of the research methodology for this study, I chose to do a survey with the locals of Chisinau (see Annex 2). The survey bears a quantitative and informational character and its meaning is to show a general position of the citizens of Chisinau towards the existence of the plan for building the Cantemir Boulevard and study their mobility pattern in terms of how and where they travel. Kothari, identifies this approach as a 'sample survey' (Kothari, 2004). According to him, this approach to research is of high relevance when surveying the entire population is not possible. In this case, however, the researcher should be deciding on such aspects of the survey like the appropriate sample size and how the sample should be selected (Kothari, 2004). In light of these, the survey sample chosen for this thesis' research consists of 100 questionnaires. This number is considered an optimal one, considering the amplitude of this research and its scope.

The survey was realised along the boulevard's axis and the questionnaire was adapted accordingly. The questionnaire studied the mobility patterns of the interviewed once (those who live in the city centre and those who come to the city centre). According to this was established a list of questions for each category of the two interviewed categories. Depending on where was the interviewed from (according to the answer of the first question) were asked a set of questions regarding their mobility patterns, preferences

on transportation modes and their position towards the existing plan of Cantemir Boulevard and its, eventual, construction. According to this survey's aim, the kind of questions would help gaining more understanding about the boulevard's issue. However, the perspective of looking at the problem is from those for whom, presumably, the boulevard was planned – the inhabitants of Chisinau. It is important to mention that, in order to simplify the data analysis, the questionnaire consists of, so called, 'closed questions' (with multiple responses).

As understood and stated earlier, the survey was realised in situ in form of a 'face-to-face' interview. Were chosen four locations along the boulevard's axis with a number of 25 interviews realised per place. Each place was previously mapped as representing a mass attraction and circulation point where locals (from the city centre) and outsiders (from outside the city centre) would come together. In addition, the time for conducting the interviews was different for each location. This was done in order to exclude any biases in the results. Rather the survey was designed to have a more equilibrated sample. However, it was not meant to have an absolute polarisation of the sample. The idea was to meet people of all age, sex, occupational categories and living places, in order to collect a larger and more diverse range of opinions. With other words, I tried to have a representative sample, as much as it was possible. The following table shows the places and summarises the way the survey was conducted.

*Table 1. Summary of how, where and when the survey took place.*

	Location	Time of the day	Hours	Number of questionnaires	Date
1.	Tighina St. intersection with Avram Iancu St.	Morning	8 <sup>00</sup> -9 <sup>30</sup>	25	30.06.2015
2.	Cojocarilor and O. Goga Streets until the intersection with V. Alecsandri St.	Afternoon	13 <sup>30</sup> -16 <sup>40</sup>	25	29.06.2015
3.	A. Pushkin intersection with Cosmonauţilor St.	Evening	18 <sup>00</sup> -20 <sup>00</sup>	25	01.07.2015
4.	Doncev St. intersection with Sf. Andrei St.	Afternoon	13 <sup>00</sup> -15 <sup>00</sup>	25	05.07.2015

The intention of the survey was to study the mobility tendencies of the inhabitants of Chisinau, as well as, gaining understanding on their way of looking at the Cantemir Boulevard, whether they perceive the amplitude of such a project. The theory to be tested was that **the people who are living in the area of influence of the boulevard's red lines know about its existence**. More, they faced its imposed restrictions in cases when they tried to build new or rebuild their old constructions. What concerns **the population from outside the city centre** or even from the upper part of the centre, the theory was that they **do not know about the existence of the boulevard**, given the fact that they will not be directly affected by it. At the same time, another assumption that was made before conducting the survey was that **either**

**categories** (locals and outsiders), in terms of the overall majority, **are against the plan of cutting a boulevard through the city centre**. This, in its turn, being motivated with the historical, architectural and archaeological value of the place and its importance for the city. Even more, because of people that would have to be evicted, and because of the very high realisation costs, which according to some estimates vary from 100 to 300 million Euro (Miron, 2007). Therefore, in big lines, the survey sought to elucidate these, above stated, theories.

On a different level, there are categories of data that cannot be found in books or from the people on the street. This is the data, which is obtained from official sources like databanks or city authorities. For this study, I needed data on the number of population and traffic in Chisinau. Most of the statistical data can be obtained from the National Bureau of Statistics. It is either available online on their web site, or, in case of more specific or specialised data, one must go to their premises and write a claim indicating the needed data. This service is for a surcharge. The claim is processed in up to 14 days. However, the Bureau does not hold information on traffic. In this case, one should address to the Centre for State Information Resources “Registru”. The procedure for obtaining the data is more or less the same. In addition, there are a number of other state organisations from where I obtained information on Master Plans of Chisinau. First of all this is the City Hall. Some of the information can be obtained from the institution’s web sites. Nonetheless, many times it is not enough and in this case one need to go and meet the authorities personally. In my case, I needed plans of the newest Master Plan Chisinau, approved in 2007. Specifically, I required information from the transportation section of the document, for understanding the reasons, which led the planners to consider, yet, building the Cantemir Boulevard. The City Hall has two dedicated days per week when it is open to population. The unit responsible for master plans is a part of the General Direction for Architecture, Urbanism and Land Relations. On Tuesdays, it is open for the planners, engineers and architects, while on Fridays, it is open for the public. Additionally, I went to the state planning institution of Chisinau, “Chisinauproiect”, for transportation plans of the previous Chisinau Master Plan, of 1989.

Another part of the research methodology is a study of the international experiences. Chisinau can learn from these cities’ experiences. There are negative and positive examples in the world that Chisinau can follow. Yerevan and Bucharest are two cities, which were in the same situation that Chisinau is facing today. The city of Yerevan, Armenia, was exactly in the same circumstances. In the first half of the 20<sup>th</sup> century through the city centre was planned a diagonal street (the Northern Avenue), which would connect the Freedom square with the National Opera Palace. However, this plan was realised many decades later, in the beginning of 2000s, causing considerable destructions and evicting many people on its way. Almost the same reality had faced the city of Bucharest, Romania. While some cities make more space for cars, others, like Amsterdam, are giving them less and less priorities. Alternatively, instead of widening the roads, North American cities are putting them “on diet”.

## C. Data Analysis

### *1. Survey data analysis*

In the following section, I will elaborate on the data that was collected during this research through various research methodology and informational sources. I will start with the analysis of the survey results. Then, I will talk about the available data on the Cantemir Boulevard and after I will explore a few case studies from cities that Chisinau can take example. Ultimately, this chapter will be decisive for answering the question whether ***Will the Cantemir Boulevard reduce the traffic congestion in the city centre of Chisinau?***

For this research, I realised a survey of 100 questionnaires. The aim of the survey was to study the mobility patterns of the inhabitants of Chisinau: what transportation modes they use for traveling through the city, is the city centre a major attracting point for the people living outside it and what do they mostly come here for. Was, also, studied people's acquaintance of the city's historical medieval core in relation with the plan of the Cantemir Boulevard. In addition, the survey had as scope to test two main theories.

1. The people, generally, do not understand the value of the historical centre of the city, they know about the plan and want the Cantemir Boulevard to be built.
2. The people, generally, do not know about the plan for building the boulevard and, eventually, would be against its building.

In other words, the survey's scope was to identify whether there is a need for the Cantemir Boulevard from the point of view of its users – the inhabitants of Chisinau. In the next paragraphs, I will present the results of the survey<sup>30</sup>. At the same time, I will test the hypotheses in order to see whether they are true or false.

Were questioned 100 people. Among them 42 women and 58 men. In the Table 1 is shown the distribution of the age and sex. Can be observed that the majority of the respondents were of age between 30 and 50 years, for both sexes, males and female. This corresponds with the general national distribution of people by age<sup>31</sup>. Among them 51 people are living in the city centre (locals) along the boulevard's axis or in the area of its influence, while the rest 49 are from other neighbourhoods, outside the physical centre (outsiders).

---

<sup>30</sup> See in the Annex 2 a sample of the questionnaire

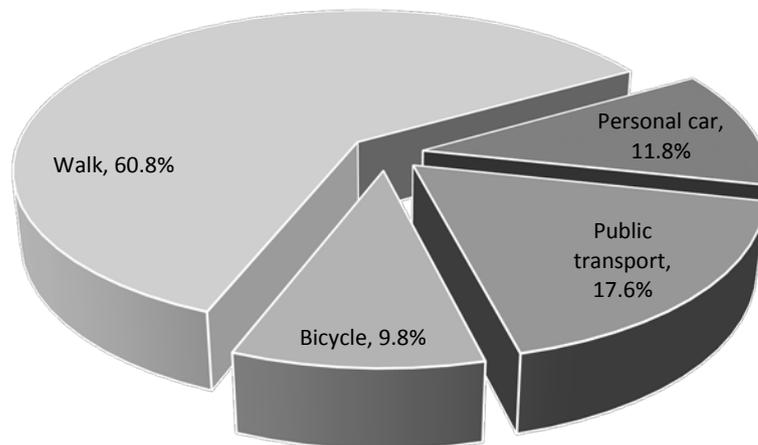
<sup>31</sup> According to the National Bureau of Statistics, the most of the population living in urban areas have, on average, 37.9 years (National Bureau of Statistics of the RM, 2014).

*Table 2. Age and Sex distribution*

		Age			Total
		< 30 years	30-50 years	> 50 years	
Sex:	Female, %	11	19	12	42
	Male, %	19	22	17	58
Total, %:		30	41	29	100

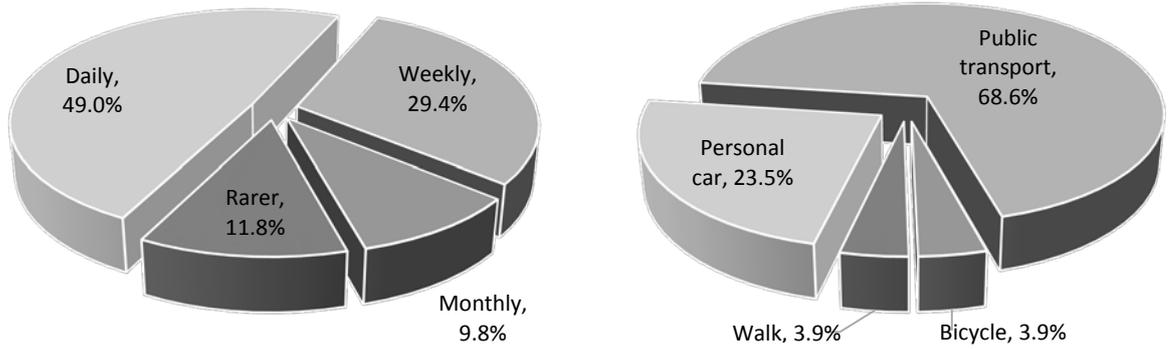
Next, I will be depicting the data obtained from the questions related to how people travel to and within the city centre. This will draw a picture, which will give an understanding of where people travel and what modes of transportation they prefer. It will also bring light on the most common reasons people come to the centre and whether the centre serves as a transit place when traveling from one neighbourhood to another.

Because the questionnaire aimed at studying the mobility of both locals and outsiders of the city centre, were elaborated two sets of questions for the two categories of people. The people from the city centre had to answer the question of *how do they move around the neighbourhood* (question three in the questionnaire). Where proposed a set of answers in order to understand that. It is by using the personal car, public transport, bicycle or by walking. The results show a majority of people who are walking or are using public transportation for travel within the centre (Figure 18).



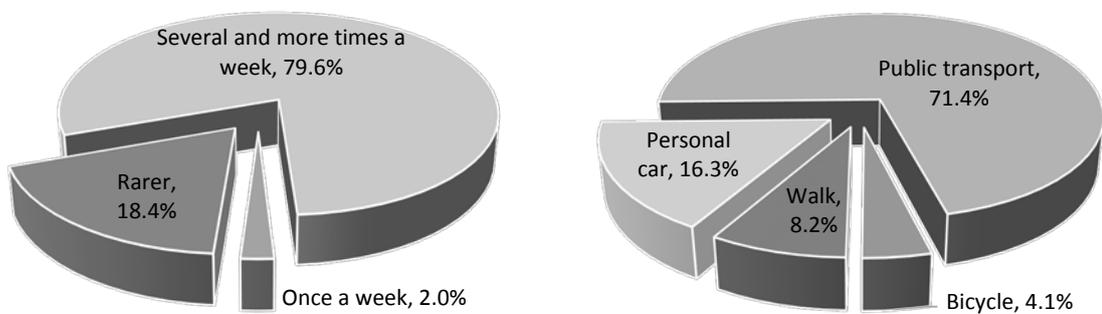
*Figure 18. This chart shows how people travel through the city centre.*

In the Figure 19 are shown the data on how do people travel from the centre to other neighbourhoods, for various reasons, and what transportation means they use for that. Can be observed that almost half of the interviewed population living in the centre, daily commutes to other city districts. From these commuters, the majority uses the public transportation network for their travel, less than a quarter use their personal cars and we have even people who walk or cycle, both representing less than 4%.



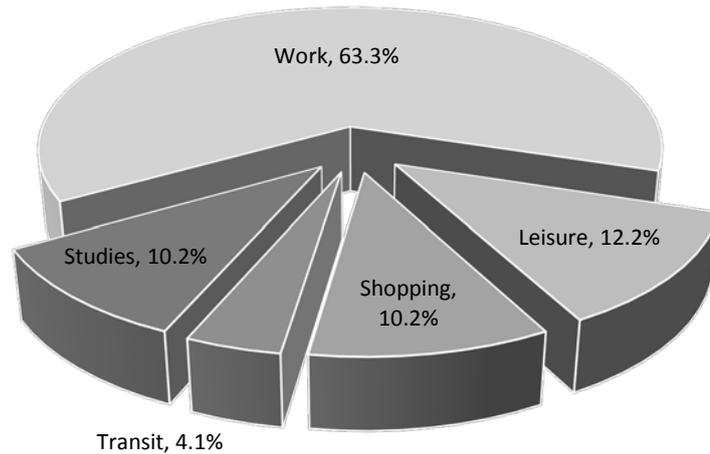
**Figure 19.** Charts showing how often people travel to other parts of the city (left) and what transportation means they use for that (right).

From interviewed people who live outside the city centre, almost 80% are coming to the city centre several times a week and even more, for different reasons (Figure 20). This can also be understood as travels on daily basis. The data indicate the numbers of people at which the central part of Chisinau is subjected to almost every day. At the same time, the majority of those traveling to the city centre use the public transportation network (Figure 20). This is another indicator, which shows, this time, how much the public transportation network is charged. From those who are coming to the city centre several and more times a week, 72% make use of the public transportation.



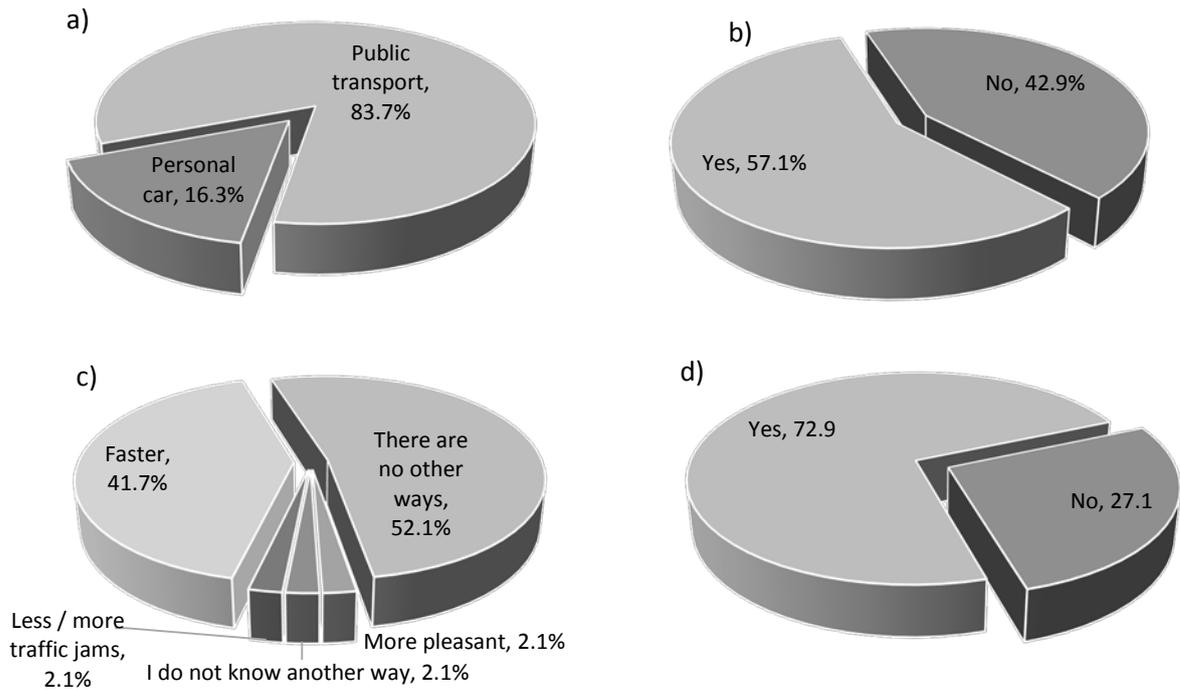
**Figure 20.** Charts showing how often the people from outside come to the centre (left) and the traveling modes they choose for that (right).

The general reason why the people are coming to the city centre is shown in the graph below. For most of the interviewed, the centre is their working place, 63.3%. The rest travel to the city centre for shopping, leisure and studies, with around 10% from the share. This is, however, interesting because in many other cities the centre, usually, is a place for leisure and shopping. For instance, in the city centre of Chisinau are located most of the cultural places, like theatres, concert halls and else. Nonetheless, the survey did not show this kind of tendency, but rather presented the centre a “worker’s quarter”. At the same time, there are people who are in transit through the centre, however, in small numbers, just 4.1%.



*Figure 21. The graph shows the data on why people come to the city centre.*

The following graph (Figure 22) explores to what extent the city centre is a transit place, in cases when the people are traveling from one district of the city to another, but its central part. Only those citizens of Chisinau who are from outside the city centre had to answer these questions. It was assumed that those who live in the centre always travel to other districts of the city from the centre and just in few cases (which are negligible) they do that otherwise. That is why, in this case, their answers to this question would be irrelevant for the study. In addition, was studied what transportation means are preferred for that. Thus, there were few questions (q. 10-14) which answered would present a complex picture of the travel patterns. The data analysis shows a general tendency of the majority to travel from one neighbourhood to another using the public transport network. In most of the cases, they transit the centre and are doing that because there are no other ways. While questioning, the people were commenting that because the public transportation lines pass through the centre they, in a way, they are forced to transit the centre. When asked if it were possible, would you avoid the city centre, 72.9% responded affirmatively. It is worth mentioning that 62% state that there are alternatives for the routes they usually choose against 25% that state that there are no alternatives and that is why they are transiting the city centre. Additionally, those who prefer the car for traveling to other districts but centre, on a scale of 62.5% avoid the centre.



**Figure 22.** a) If you need to travel to other neighbourhood than Centre, how do you go there?  
 b) Is it always through the centre?  
 c) Why do you prefer that?  
 d) Would you avoid the centre if it were possible?

In the next lines will be shown and analysed the data, which will depict traveling patterns and trends concerning their day-by-day routine. This includes information about where do people work, how they commute there and how much time it takes them to reach there. The same type of information was asked about where they take the children to kindergarten or school, where they shop and where they spend their recreational time. This was done in order to understand how and where people travel and how much time it takes so that I can have a wide picture of their mobility patterns. Therefore, the results illustrated in the next tables show, as it was expected, that people from the centre tend to organise their lives around the places they live (Table 3). These are their working, shopping and leisure places. Concerning mobility, the car is rarely used, the majority choosing to walk. At the same time, most of the trips are shorter than 20 minutes. The people from outside the centre, on a level more than 70% percent have their working places in the centre. As transportation, they make use, in most of the cases, by the public transportation network and their trip lengths are in between 20 and 40 minutes. The numbers, also, show a tendency of those from outside to shop within a walking distance, in their neighbourhoods. The big number, 49%, of shopping in the centre is because the people work in the centre and tend to also shop from here. In addition, the central market place has an important role here, since the prices there are, usually, lower. When it comes to leisure time, as it can be observed, the preferences are shared; some choose to come to the centre while others stay outside the centre.

Table 3. Mobility patterns of the people concerning their daily activities: work, shopping, bringing children to school / kindergarten and recreational time.

**People living in the centre**

	Where		Total	Time			Total	Mode				Total
	In the centre	Outside the centre		< 20 min	20-40 min	> 40 min		Personal car	Public transport	Bicycle	Walk	
<b>Work</b>	48.6%	51.4%	100%	72.2%	27.8%	-	100%	5.6%	22.2%	-	72.2%	100%
				42.1%	36.8%	21.1%	100%	15.8%	68.4%	5.3%	10.5%	100%
<b>Kindergarten/ School</b>	74.4%	25.6%	100%	93.1%	6.9%	-	100%	6.9%	13.8%	3.4%	75.9%	100%
				40.0%	50.0%	10.0%	100%	30.0%	50.0%	20.0%	-	100%
<b>Shopping</b>	88.2%	11.8%	100%	86.7%	11.1%	2.2%	100%	4.4%	6.7%	4.4%	84.4%	100%
				33.3%	66.7%	-	100%	50.0%	-	-	50.0%	100%
<b>Leisure time</b>	62.2%	37.8%	100%	75.0%	25.0%	-	100%	10.7%	7.1%	-	82.1%	100%
				35.3%	29.4%	35.3%	100%	70.6%	17.6%	-	11.8%	100%

**People living outside the centre**

	Where		Total	Time			Total	Mode				Total
	In the centre	Outside the centre		< 20 min	20-40 min	> 40 min		Personal car	Public transport	Bicycle	Walk	
<b>Work</b>	73.2%	26.8%	100%	26.7%	53.3%	20.0%	100%	16.7%	73.3%	3.3%	6.7%	100%
				54.5%	36.4%	9.1%	100%	18.2%	72.7%	-	9.1%	100%
<b>Kindergarten / School</b>	10.0%	90.0%	100%	66.7%	33.3%	-	100%	33.3%	-	-	66.7%	100%
				70.4%	25.9%	3.7%	100%	14.8%	33.3%	-	51.9%	100%
<b>Shopping</b>	49.0%	51.0%	100%	20.8%	66.7%	12.5%	100%	16.7%	62.5%	-	20.8%	100%
				80.0%	20.0%	-	100%	12.0%	24.0%	4.0%	60.0%	100%
<b>Leisure time</b>	45.2%	54.8%	100%	21.1%	63.2%	15.8%	100%	10.5%	63.2%	-	26.3%	100%
				43.5%	34.8%	21.7%	100%	26.1%	39.1%	-	34.8%	100%

One important question the respondents were asked was what do they think about the public transportation network. In their opinion, is it working efficiently or not? The results show a shared opinion: 52% of the interviewed answered affirmatively to the question, whereas 48% were not satisfied with the work of the public transportation system. The respondents who answered negatively to the question were asked to explain why they think so. The answers were various. Some of them are presented in Table 3. What needs to be mentioned about the public transportation system of Chisinau is its structure. The city is serviced by three major systems: trolleybuses, buses and minibuses. In 2014 were transported more than 67 million passengers with the buses and minibuses and more than 107 million with the trolleybuses (Valcov, 2015). To some extent, the opinion on the public transportation confirms the general view, which is shared by the most of the inhabitants of Chisinau. The half of the population is content with its service while the other half is not. In the comments were mentioned several times about the minibuses' routes which were changed not long ago and which confuse the population with their new itineraries. It is true also that the city has old transport units (trolleybuses and buses), which in some cases are older than 30 years. From my point of view, the public transportation network could do better. However, it is not because of its bad network, it is rather because of its poor traffic conditions. These are of course, the traffic jams all over the city. Hence, there are delays in the schedules. The old transport units also affect the overall work of the system as they constantly break. They also put in danger passengers' security. The good thing, though, is the price for one trip, which is accessible to all sections of the people. At present,

*Table 4. Why do people think transportation system works inefficiently in Chisinau.*

<p>Explain, please, why do you think that public transportation is inefficient in Chisinau?</p>	<ul style="list-style-type: none"> <li>• Bad roads, transport units and administration;</li> <li>• Broken schedules;</li> <li>• Changed routes of the minibuses;</li> <li>• Insufficient transport units;</li> <li>• Overloaded transport units;</li> <li>• The minibuses need to be removed;</li> <li>• Electronic system for transport administration;</li> <li>• Inefficient minibuses due to low prices of travel tickets;</li> <li>• Overloaded transport units;</li> <li>• The minibuses need to be removed;</li> <li>• Traffic jams;</li> <li>• Many personal cars with uneducated drivers;</li> <li>• Not enough connected network;</li> <li>• Old transport units; aggressive drivers;</li> <li>• Overloaded, uncomfortable, unpleasant, insecure minibuses;</li> <li>• Poor administration;</li> <li>• Transport too hot;</li> <li>• Unprofessional and undisciplined drivers;</li> <li>• Waiting stations in bad conditions.</li> </ul>
---	--

is 2 lei/trip with the trolleybuses and 3 lei/trip with the bus or minibus, which if converted makes 0.1 and 0.15, respectively, eurocents/trip.

Another important aspect, which was studied through the survey, was the travel time. This characteristic explains a city's accessibility in time. What is imperative to be mentioned is that the travel time is directly linked with the quality of life (Cutler, 1975; Mollenkopf et al., 2005; Kolodinsky et al., 2013). Thus, the inhabitants' well-being is directly affected by how good the city is connected and how short (in time) the trips are. From the Table 2, can be inferred that most of the trips, made within Chisinau, are no longer than 40 min. The normative elaborated in Soviet Union, but which is still in power in Moldova, states that a trip should not last longer than 40 min (USSR State Building, 1989). This condition, somehow, is preserved until today, however rather on shorter distances and with the condition that the traffic flow is acceptable. Today, due to increased traffic congestion and the spread of the city, in many cases it is no longer possible to have shorter (in time) trips, especially, when traveling from one district to another, outside the city centre. Nonetheless, the centre is at 20-40 minutes distance from any other regions of the city using the public transportation. In Figure 23 are presented the data on travel time to all directions.

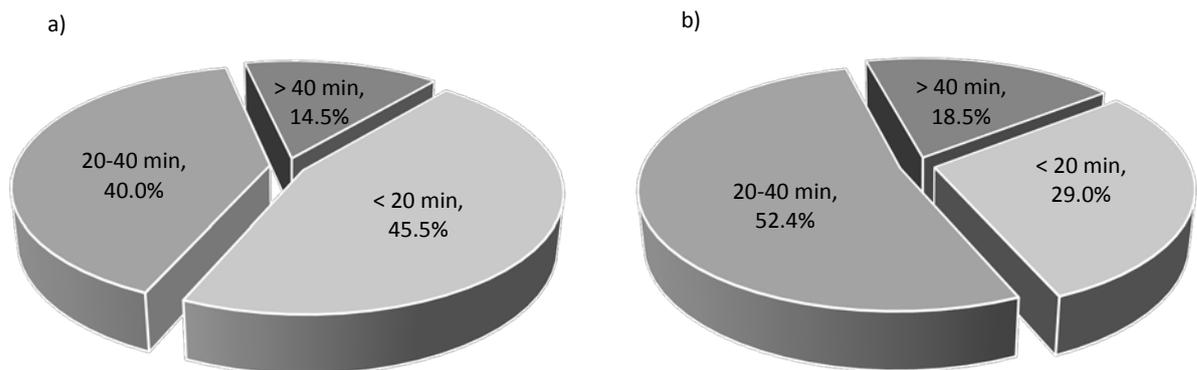


Figure 23. Travel time by car (a) and by public transport (b) to all directions.

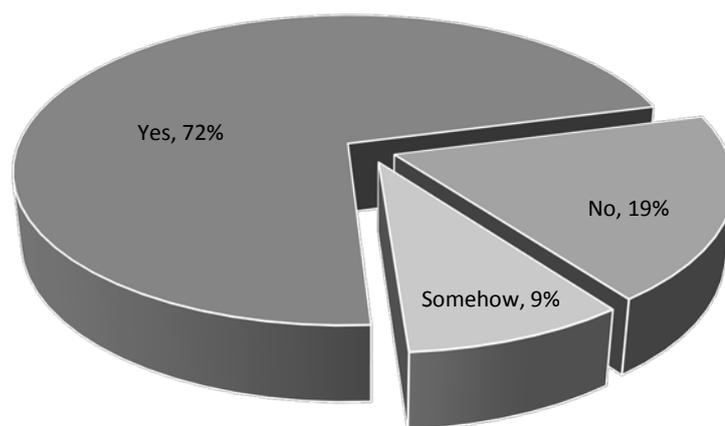
The results show that the majority of those traveling by car reach the destination in less than 20 minutes, while the public transportation users' trips are, in most of the cases, between 20 and 40 minutes long. These data, however, present the travel time needed for accessing the city centre, because the survey did not study the time needed for traveling from one district to another outside the centre.

Following the same train of thoughts, from those who own a car (50.5%), 57% use it for travels outside the cityscapes, while the rest 43% use it for traveling through the city. From the Table 2 can be observed the same tendency that the number of trips with the car made for various reasons is kept on lower levels.

In the following paragraph, I will explore the theories, which were established before the survey was realised. Testing the theories will be done using the data obtained from survey. The two theories were stated above in this section. However, for commodity, they are repeated below. Therefore, were thought that:

1. The people, generally, do not understand the value of the historical centre of the city; they know about the plan and want the Cantemir Boulevard to be built.
2. The people, generally, do not know about the plan for building the boulevard and, eventually, would be against its building.

Few questions in the questionnaire would help in identifying the necessary support for accepting or rejecting the theories. The two direct questions in the beginning of the questionnaire were asked for that matter. However, the answers to these questions would not be considered as enough proof and that is why at the end of the questionnaire the interviewed were asked what they think about the Cantemir Boulevard and if they would support eventually its building. The answers of these questions in ensemble will give an objective perception of the issue of the Cantemir Boulevard. Therefore, if one knows that he or she lives or works in the medieval part of the city and understands its historic value than the assumption is that he or she will not support the plan for building the boulevard, because of reasons heritage preservation. Otherwise, if he or she knows about the medieval core and understands its historic value but supports the plan of the boulevard than there is something in between which is misunderstood, which needs a more in-depth study and understanding. The data on the problem of the Cantemir Boulevard are presented below.



**Figure 24.** The level of understanding of the historical value of the medieval city centre among the respondents.

*Table 5. The relation between understanding the value of the medieval city core and the plan for the boulevard*

Do you understand the historic value of the centre?	Do you know about the boulevard?		Total	Do you think there is a need for one?		Total
	Yes	No		Yes	No	
Yes	45.8%	54.2%	100%	43.3%	56.7%	100%
No	36.8%	63.2%	100%	83.3%	16.7%	100%

Do you support it?					Total
Totally support	Support	Indifferent	Against	Totally against	
7.1%	32.9%	12.9%	25.7%	21.4%	100%
15.8%	68.4%	5.3%	10.5%	-	100%

A glance at the Figure 24 and a careful analysis of the Table 4 provides the data for testing the two theories. A closer look at the numbers reveals that the first theory is rejected. However, the figures are at limits. Thus, in reality, most of the respondents understand the value of the historical centre; they do not know about the plan for building the boulevard and they think that there is no need for one cutting through the centre. In addition, they would not support the idea of building the boulevard.

Further, the second theory is proven true as the data show that the people, generally, do not know about the Cantemir Boulevard and the majority is against or totally against building it.

For testing the two theories, the responses of those who somehow understand the historical value of the centre were neglected, as the number is too small for showing a strong relevance in this matter.

The important aspect here, which needs to be stated, is that the theories were tested by putting the data obtained from the respondents living in the centre and those living outside it. Therefore, the results might be biased while the reality different if the two groups of people were to be taken separately. The next tables illustrate with numbers exactly my point.

**Table 6.** The differences in opinions of the two groups of people from the centre and outside centre.

<b>Do you know about the Cantemir Boulevard?</b>		
	from the centre	outside centre
Yes	56.9%	31.3%
No	43.1%	68.8%
Total	100.0%	100.0%

<b>Do you think there is a need for Cantemir Boulevard?</b>		
	from the centre	outside centre
Yes	47.9%	52.2%
No	52.1%	47.8%
Total	100.0%	100.0%

<b>Would you support the construction of the Cantemir Boulevard?</b>		
	from the centre	outside centre
Totally support	2.0%	14.3%
Support	34.7%	51.0%
Indifferent	10.2%	10.2%
Against	28.6%	18.4%
Totally against	24.5%	6.1%
Total	100.0%	100.0%

The tables above show to which degree the opinions are different. This way, most of the people living in the centre knew about the plan for the boulevard while most of the people from outside the centre did not know about it (56.9% to 68.8%). This, in turn, has reflected on the general data. Most of the people from centre do not believe there is a need for the boulevard, while those from outside believe otherwise (52.1% there is no need and 52.2% there is a need). At the same time, while those from the centre do not support, in majority, the idea of the boulevard, the others support and totally support it. With other words, the numbers speak for themselves. My point is that the majority does not represent, necessarily, the opinions and the ideas of the minorities. In this case, the people from the centre are more aware about the problem than those living outside the centre are. That is why when dealing with the kind of sensible data it is important to treat it attentively and consider all its aspects.

## ***2. Data on the Cantemir Boulevard***

Next, I will talk about the data on the Cantemir Boulevard and will analyse the problem that, by building it, is planned to solve. I will show the data on traffic and population in Chisinau, especially, for its central part, where the boulevard should be built. This will draw a picture in technical terms of planning and will give a feel of the aroused dispute.<sup>32</sup>

---

<sup>32</sup> Data from the Transport for London (<https://tfl.gov.uk/>) and Office for National Statistics (<http://www.ons.gov.uk/>)

Today in Chisinau live more than 678 thousands people while together with surrounding towns and villages (subordinated to Chisinau) the number rises to 809 thousands. For the past ten years, the population number has grown with about 17 thousand in the city and about 29 thousands for the municipality (Valcov, 2015). Together with the population growth, the car number is growing as well. This way, in 2006, at the time when the last Master Plan of Chisinau was realised, in the city were registered 218 thousands personal automobiles (INCP Urbanproiect et al., 2006). In 2010, already, the statistics show an increase and the registered number was 231 thousands (I.M.P. Chişinăuproiect, 2010). By the year 2014, the car numbers continued to rise and this time it reached 260 thousands (Publika.md, 2014). This makes, for the year 2014, 385 cars per 1000 inhabitants. For comparison, in 2011, in London, United Kingdom, were registered 317 cars per 1000 inhabitants. To that should be also added the cars, which are not registered in Chisinau, but are driving daily on its roads. Thus, having these numbers in mind it is easy to imagine to what extent the city is struggling with traffic problems. In this context, the planners have seen that the only and the best solution for solving the increasing traffic congestions is to widen the existing streets and build new roads. This is also a perfect scenario when, in the same mind-set, the Cantemir Boulevard was seen as opportune, as the ‘cure to all the problems the city is facing’.

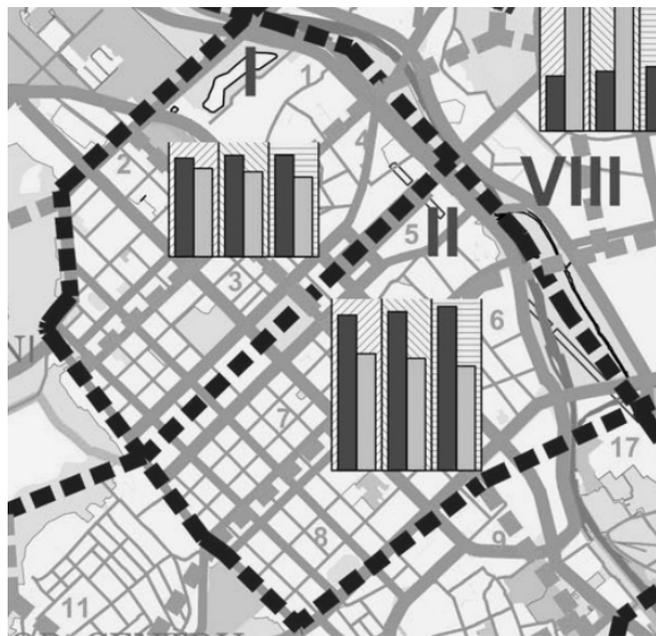
The data from the 2006 Master Plan, shows an average driving speed of 21 km/h through the centre, while in the other districts it varies from 30-40 km/h (INCP Urbanproiect et al., 2006). For instance, Chisinau is a strong competitor to Paris, which was named the city with ‘the worst traffic in Europe’ with an average driving speed of 23 km/h (The Connexion, 2010). In rush hours, the central part of Chisinau endures a tremendous amount of cars. It rises, on some streets, up to three thousands units per direction while in other neighbourhoods, on biggest arteries, the numbers are less than two thousands (I.M.P. Chişinăuproiect, 2010). The following table displays the amount of congested streets all over the centre during rush hours.

*Table 7. The level of streets' capacity usage in the centre of Chisinau, 2005*  
Source: (INCP Urbanproiect et al., 2006)

No.	The level of capacity usage <sup>33</sup>	Streets	
		km	%
1	< 0,25	2,35	5,3
2	0,25 – 0,50	9,85	22,4
3	0,51 – 0,75	7,40	16,8
4	0,76 – 1,00	14,5	33,1
5	> 1,00	9,85	22,4
	<b>Total</b>	<b>43,95</b>	<b>100</b>

<sup>33</sup> These numbers represent the ratio obtained by dividing the road's capacity and its actual load and organised accordingly.

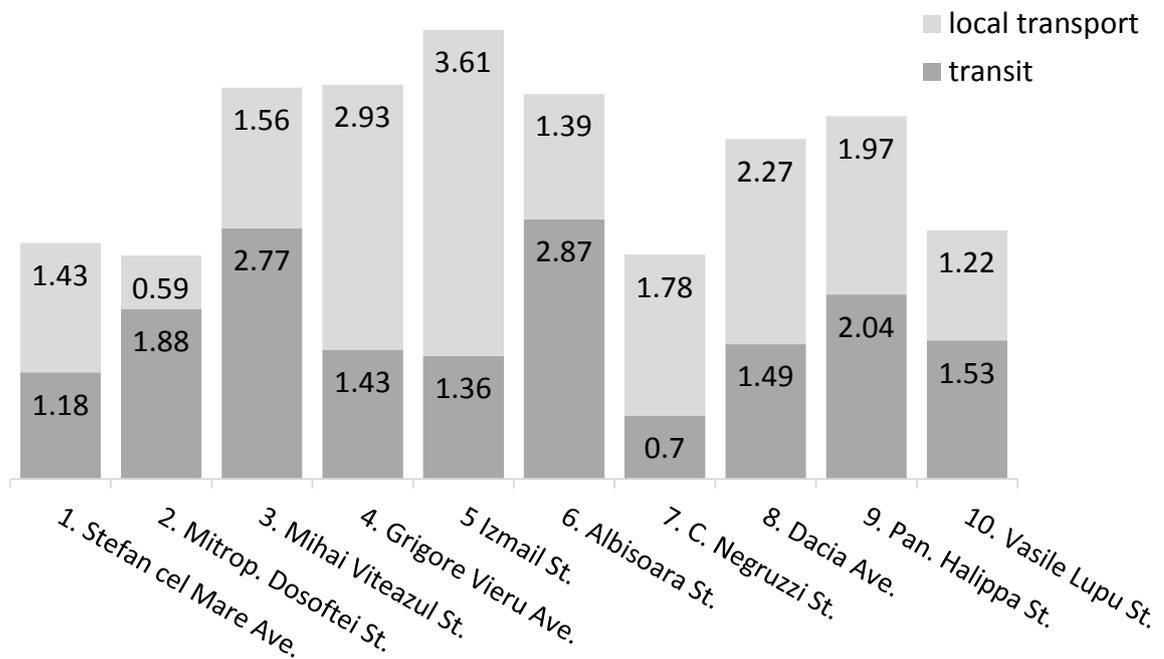
According to the Table 6, the streets of the central Chisinau are in a critical situation. Only 16.8% of the streets are working at a level, which is considered normal (50-75% load) and more than 50% of the roads are overloaded. This way the analysis concludes that due to the unrealised works proposed in the previous master plans (especially it is mentioned the Cantemir Boulevard also a few bypass roads to avoid transiting the centre) the city traffic today is exceeding the limits (INCP Urbanproiect et al., 2006). A major factor, which contributes to the congestion of the centre, is its role in city's life. Besides its geographically central location in the city, the centre also represents the political, economic and socio-cultural heart of it. Here are located the offices of many organisations which attract a big numbers of workers. This was also shown by the results of the survey, presented earlier in the text. The ratio between the workers and inhabitants in the centre of Chisinau is presented in the infographic below.



**Figure 25.** Total number of employees (dark grey) compared to the number of inhabitants (light grey), 2010.  
Source: (I.M.P. Chişinăuproiect, 2010)

Together with huge numbers of the employees who are commuting to the centre on daily basis, are other categories of people who come to the centre for various reasons or are in transit. The Central Market is one of the places, which attracts everyday thousands of people. The Central Bus Station is another factor of interest for the people who need to travel to national or international destinations. Besides these, scattered throughout the centre are many other important locations for shopping, leisure, studies, culture and else. In most of the cases, the people are using the public transportation network to reach them. However, due to the inefficiency of the system, many choose to travel with the personal automobile, hence, the narrow streets are always filled up with parked cars, which in their turn obstruct the flow of the traffic. A study realised for the 1989 Master Plan of Chisinau presented data of the Chisinau's traffic of the time. The data represents the number of automobiles entering or transiting the centre. Even

though, the data is older than 25 years, the tendency remains actual since the street fabric did not change (Figure 26).



**Figure 26.** The Flow of automobiles entering and transiting the centre in thousands of units during five hours, 1988.  
Source (I.M. Chişinăuproiect, 1990)



**Figure 27.** Streets represented on the map. Numbers correspond to street names from Figure 9.

What is important is to understand from the above chart, even the data is outdated, are the routes that the drivers choose for transiting the city centre, as well as for accessing it.

Therefore, having analysed the traffic data in the central Chisinau, it is easy to understand why the city planners proposed the solutions they did. This way, for easing the access of the cars and improve the traffic flow, they keep proposing the same old plan for building the Cantemir Boulevard. This proposal comes along with other ones, which in the end should bring the throughput of the central arteries to levels according to the normative. Among the benefits that the boulevard should bring the most significant are:

- The new boulevard will take some traffic loads therefore will unload some of the main arteries of the centre like *Stefan cel Mare* and *Albisoara* Streets (1 and 6 in Figure 27);
- The new boulevard will ease the access and will facilitate the mobility in the lower central part (by completely destroying it);
- The new boulevard will improve the ecological condition of the lower centre (by bringing more cars?);
- The new boulevard will become a new modern thoroughfare with optimized parameters and contemporary amenities.

If it is to be realised, the boulevard will initially have four lanes (two in each direction) and, eventually, it can be expanded with two more lanes (one on each direction) (INCP Urbanproiect et al., 2006).

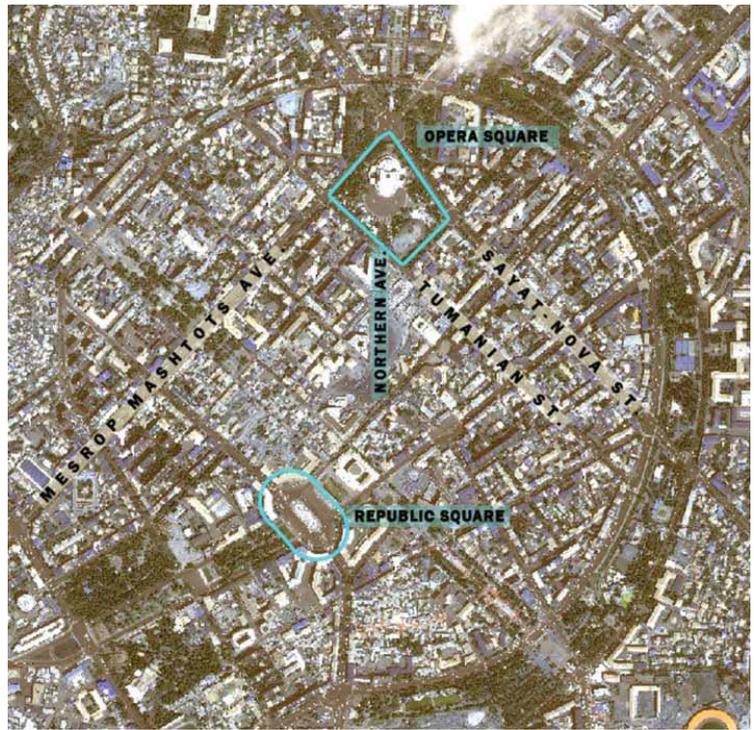
### *3. Case studies*

In the following paragraphs will be explored case studies with similar and opposite experiences. At first, I will show case studies from cities, which had the same fate that Chisinau is going to face if the plan for the Cantemir Boulevard passes final approving instances. Then I will show cases of cities, which had opposite experiences to that of Chisinau. In ensemble, this will result in an analysis of lessons to be learned by Chisinau's planners, authorities and inhabitants.

The capital of Armenia, Yerevan, a city with a millenary history, counts today more than one million inhabitants. Yerevan, the city that has many in common with Chisinau, was point of interest of many nations throughout its lifetime (Ter-Ghazaryan, 2013). In 1920, Armenia was integrated into Soviet Union and Yerevan became the capital of the Soviet Armenia. Together with that, in 1924, was developed first master plan for Yerevan. The chief architect of the time designed the central part of the city in shape of a semicircle (Ter-Ghazaryan, 2013). Two important places were dominating the central part of Yerevan – the Republic Square and the Opera Square. However, these two locations were remote one from the other. The centre of the city being mostly developed following a rectangular street pattern made the two places, rather difficult to reach if one decided to walk from one to the other. This way, in the master plan of 1924 was designed a wide pedestrian thoroughfare to connect the two dominating squares (Ter-Ghazaryan, 2013). *The Northern Avenue*, as it is known today, was never built during Soviet times because it implied high building costs and the small budget of the city would not permit that and because the avenue had to cut through a residential neighbourhood. The neighbourhood, mainly built up with pre-Soviet residential buildings, in one-two levels, was the principal impediment in front of building the avenue. This, in its turn, would imply major expenses on relocating the people, which would raise the

avenue costs to numbers that could not be afforded (Ter-Ghazaryan, 2013). This way, the plan for the avenue was never realised until after the collapse of the Soviet Union and the independence of Armenia.

Nonetheless, the plan was considered again as potential for the struggling economy of the city and the overall country in the late '90s, when in power came a 'more nationalistic government' (Ter-Ghazaryan, 2013). Now the idea behind the boulevard had changed. It sought, according to the mayor of Yerevan, to "civilise the city centre" and "give it a neighbourhood of "adequate"



*Figure 28. The centre of Yerevan. Opera Square, Northern Square and Republic Square are highlighted. Source: (Ter-Ghazaryan, 2013:574)*

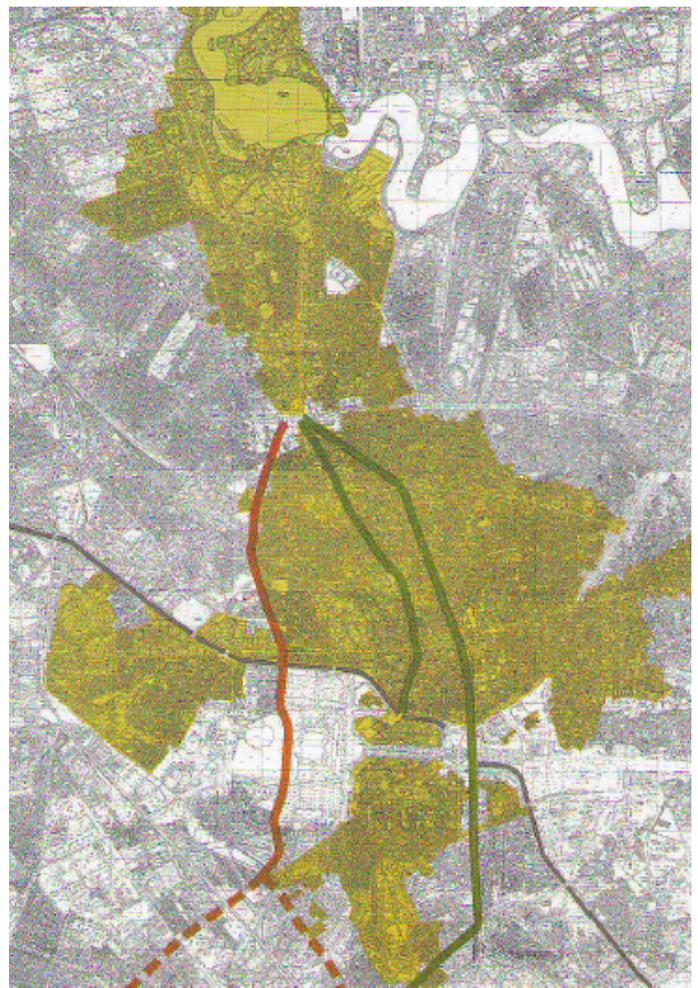
residential, and most importantly, office space for foreign and Armenian companies, and to set on the course of rebuilding and rebirth of the city" (Ter-Ghazaryan, 2013:580). As it was expected the residents of the neighbourhood were evicted and, in the most profitable area of the city, was begun a mass destruction process. Instead of the demolished residential buildings were erected other ones, highly expensive and non-affordable to most of the citizens of Yerevan (Eraso and Andreassian, 2007; Ter-Ghazaryan, 2013). The protests of the inhabitants were also not long awaited. Being frustrated, first, because they were forced to leave their houses, then for not obtaining proper compensation for their homes, the protests continued during the whole construction time (Baghdasaryan, 2013). The avenue was inaugurated in 2007 (Figure 28) with a 'triumphal walk' of the then president of the country, Robert Kocharian, while, the forced to move out residents were still struggling to get their fare compensations (Ter-Ghazaryan, 2013).

Another capital city, with the same destiny, is Bucharest, Romania. This time, however, it is about creation of a new boulevard, meant for cars, to cut through historical centre. An idea, which has its inception in the 1939 master plan of Bucharest (Ghenciulescu, 2011). Yet, another strategy for city development that revives from a, rather, old master plan and which does not conform to the new urban development tendencies. The axis, known as the new city Boulevard *Buzesti – Berzei – Uranus*, is not planned for the traffic in transit, but, as the design principal of the project said, it is meant to facilitate the connection between different functional zones of the city on the direction North-South. In fact, the new boulevard is doubling the other two existing that pass the centre North-South and it is meant to unload the existing ones from traffic. It is however important to note that *Buzesti – Berzei – Uranus* is not an

entirely new, from scratch, construction. The plan for the boulevard consists of three stages. The first stage implied the widening of the existing Buzesti and Berzei Streets. On the official webpage of the mayor of Bucharest, because it is mainly his merit, the completion of the first stage sounds like an immense achievement for Bucharest, its citizens and himself (Oprescu, 2014).

Thus, the idea for creating a new boulevard cutting through the historical centre re-appeared in the Bucharest master plan approved in 2000 (Popescu, 2010). The zoning plan for it was sanctioned by the city council in 2006 (arhiforum.ro, 2011) and was started being built in 2009 (infoo.ro, 2014). However, at the initiative of the civil society the construction was stopped few months later following a court order (arhiforum.ro, 2011; infoo.ro, 2014). As the street was supposed to be widened to 24m for the roadway and other 5m on each sides as sidewalks, the construction required to be demolished a range of 87 houses among which were a number of historically important buildings (Raiden, 2010; Ivanov, 2010; Popescu, 2010). The eviction of the people was done through expropriation and offering them a compensation in money for their homes however, the people remained discontent with the decision, moreover with the sums they were offered (Ivanov, 2010). Among the many historical monuments that were razed, one, which attracted the most civil society's attention, was *Hala Matache* – part of the industrial heritage of Bucharest. Until it was illegally demolished in 2013 (realitatea.net, 2013), this building was very well functioning as a market place. Its demolition infuriated the civil society, which consequentially initiated a law court process. In result, the court declared the decision for demolishing the market illegal and through its decision forced the city hall to rebuild it (activewatch.ro, 2013; Oprescu, 2014). However this was just one little thing that could be saved.

In such manner, Bucharest acquired a new large boulevard cutting through the historical centre, but it lost a few dozens of historical monuments. At the same time, it is argued that the new street would bring, in the end, more cars into the centre than it would relief it from them (SSX and LDA, 2011).



**Figure 29.** The Buzesti – Uranus Axis (left in red) doubles the historical North-South Axes (centre Victoriei Road, right Magheru Boulevard). In yellow are marked the protected areas.  
Source: (Ghenciulescu, 2011:86)

While cities in the East are building more roads for accommodating more traffic, cities in the West have refuted the car-oriented development. The citizens of the city of Amsterdam, for example, understood that the cars are not for the city and began to reclaim its spaces from them. They started to take action after the traffic casualties peaked in 1971, to reach 3300 deaths, among which 400 were children. The 'fierce activism' that followed made possible so that Amsterdam today could be called 'the bicycle capital of the world' (van der Zee, 2015). The most known campaign against the motorists was called *Stop de Kindermoord* ("stop the child murder"). Its activists used to reclaim their city space through activities like closing the streets for the cars so that the children could have space for playing on weekends. Surprisingly, these actions were saluted and encouraged by the local police and even got support from the authorities. Soon, *Stop de Kindermoord* installed a headquarters and with the support of the authorities started to work on plans for making the streets pedestrian friendly. At that time was invented the '*woonerf*' (van der Zee, 2015). Roughly translated, the word means a 'living street', which implies a good coexistence of pedestrians, cyclists and, to some point, cars on one street. While the street is not equipped with any traffic signs, encouraging interaction and making eye-contact (Hockenos, 2013). Few years later, was established the *Cyclists' Union* whose aim was, also, to reclaim the city from cars and fight for a share on the roads for bicycles through numerous bike protest and illegal painting of the bike lanes in places considered dangerous for cyclists. They were taken by the police, but eventually these actions reached the bigger population and the government, which, consequentially, reacted to the needs of the cyclists. Today, the number of trips made with the bicycle grows up to 38% and it is still growing (van der Zee, 2015).

Taking another order of thoughts, on the other side of the Atlantic, the North Americans are putting the roads on 'diets'. The idea of this principle is instead of widening the streets is to shrink them, by removing from the number of lanes and changing them with bike and pedestrian paths (Burden and Lagerwey, 1999). Burden and Lagerwey argue that after these changes the streets become safer and more efficient. More, the cost for rebuilding these roads often times are reimbursed in about one year as the property value on the reconstructed streets increases. Putting the roads on 'diets' has proven a good way to improve the neighbourhood's quality of life, facilitate pedestrian and bicycle accessibility and of cars as well. However, this should be realised after a careful analysis of the roads by the transportation planners and engineers, the authors say (Burden and Lagerwey, 1999). What makes this approach curious is the fact that the traffic flow does not decrease after the intervention, but remains the same. Even more, some examples show an increase in carrying capacity of the roads. This happens, as Burden and Lagerwey explain, because the road becomes smaller and the motorists are forced to drive slower and take lesser dangerous turns. As not everyone possesses the same dexterity for driving

at higher speeds, all are made to reduce from the speed, thus assuring a more stable traffic flow. Hence, the carrying capacity of the road is maintained or even increased. At the same time, pedestrians' safety is increased, because they have larger sidewalks, and are able to cross the roadway more easily. For the cyclists are created conditions too (Burden and Lagerwey, 1999). The overall result of such an intervention is, this way, obvious as the street's capacity is kept, its security is increased and it acquired space for cyclists and more space for pedestrians.

In broad lines, by analysing the successful and not so much successful experiences from all over the world, Chisinau can create its own developmental strategies and choose which way to take, go for the outdated car-oriented development or follow a path for improve the life quality of its citizens by choosing the sustainable development. Anyway, these are just few examples from which some lessons can be learned and adapted to the reality of the city of Chisinau.

## D. Research limitations

Even though the research was in detail prepared and realised, I am aware of its limitation and drawbacks, which to some extent prevented me to see the question from broader perspectives. In this research, I identified three major limitations that I consider in this chapter.

The aim of the first section was to write a review on the on the existing literature on urban mobility and transportation. The shortcoming of the section, as I see it, was the immense amount of the information and data available, on one hand, and the limited means a student, like myself, has to access it, on the other hand. Indeed, a simple inquire in an online search engine gives an enormous amount of data to deal with. At the same time, this is, at some extent, the point of making a literature review – to learn to find the best fitting info for the research. However, it remains a limitation because from the amalgam of available information, it is easy to miss something out and it is time consuming, especially, in the limited time for the thesis. In addition, many times, like in the case of the academic journal papers or books, the access is restricted or requires payment.

As a part of the research methodology, I have realised a survey with the inhabitants of Chisinau. The survey consisted of 100 interviews. This number of interviewed give and impression of the situation on the field, however the small samples are difficult to relate to the larger population and to make generalisations. Nonetheless, from my empirical experience, I can say that the opinions are well distributed and, generally, do conform to the real situation on the field. To this is added the short time for realising the survey and processing the data.

Ultimately, as the research question of this thesis is practical and profession specific, I have collected limited opinions of the field professionals and concerned people. However, I relied on official documents and data, like master plans, normative documents and my empirical experience in the field, which represent the general idea.

### III. CONCLUSION

In this last section of this work I will present the conclusions that the study lead me to. The section is divided into several parts, each with a specific content relating to the study. In the first chapter, I will talk about the problem of the boulevard, will conclude the literature review and survey results, and will answer the research question. Then I will open new discussions towards what can be or should be done so that the people understand the implications and complications of such a project. Ultimately, will be proposed some solutions that from my point of view will ameliorate the situation of Chisinau and improve the overall life quality in the city.

At first, I will make a short summary of the work that has been done so far for this research. Therefor the thesis is composed of three main sections: (1) *Introduction*, (2) *Cantemir Boulevard analysis* and (3) *Conclusion*. The introductory part started with explaining the core problem that this research studied, stating the research question and setting the working objectives. Following was realised an extensive literature review on the topic of city transportation and mobility, which highlighted the most acute problems debated in the academic and professional fields today. In addition, through the review were identified the new trends and targets in urban transportation development. The main issues that are debated are the sustainability aspects of transport, reducing from traffic congestion and from trip lengths. Respectively, the global research is aimed at finding the best developmental means to address these. It is argues that an interdisciplinary approach to planning should be considered. Various professionals from different fields of activity (engineers, architects, planners, economists, sociologists, etc.) should work together. Next, I presented shortly the history of Chisinau and the stages of its development. These are the market town Chisinau, the city capital of a Tsarist Guberniya, the capital of the Moldovan Soviet Socialist Republic and the capital of the independent Republic of Moldova.

In the second section, I focused on analysing the issue of the Cantemir Boulevard. Mainly, this part discussed the topic of Cantemir Boulevard from what it means, the issues it is raising in the city today, to data analyses, which were collected from various sources, however the core data being the results of the survey. This way, in short, Cantemir Boulevard is a large street planned to cut through Chisinau downtown aiming at decongesting the central part through unloading some of the main streets of the centre and facilitating the mobility within the centre. The plan exists already more than forty years. This means that, lacking enough financial resources, the idea for building it was postponed from one master plan to another. This way, today, the idea for cutting a boulevard through downtown, a residential zone, is still not rejected. Even more, in conditions when such ideas are long forgotten or avoided in the western society, our planners, which strive to reach western planning heights, nonetheless see it as the only solution. The text then switches to analyse the results of the survey with the inhabitants, which was aimed

at testing the two theories (see Data Analysis chapter) and to understand their position regarding the issue of the Cantemir Boulevard. In addition, the same chapter presents other data concerning transportation in Chisinau, like car numbers reported to population. Are shown, also cities with similar experiences and cities, which chose other kind of development that rejected the automobile. This section concluded identifying the research limitations, which, one way or the other, could not be avoided.

The survey data results show a rather interesting picture. As the aim of this questionnaire was to analyse and understand the position of the population, and test its knowledge on the plan for the Cantemir Boulevard, as well as its mobility patterns, the results show very split opinions with no strong majority. Therefore, it is rather difficult to draw a straightforward conclusion. Nonetheless, from the extensive analysis of the results that has been done in the Data Analysis chapter and the data from Chisinau's 2007 master plan, which motivates the need for the Cantemir Boulevard, I conclude the following:

1) The main reason for which the Cantemir Boulevard is proposed for execution is, as motivated, the increasing number of cars and a highly congested city centre (INCP Urbanproiect et al., 2006). This way the boulevard should resolve these traffic problems, especially, it should improve the accessibility (it is meant by car) of the downtown. Consequentially, the results of the carried out survey with the inhabitants of Chisinau show a different picture. Most of the respondents stated that they generally make use of the public transport system to travel through the city, while within the city centre they walk. This way the data from the master plan and the results of the survey show obvious discrepancies (if not a paradox). Moreover, the tendency of people using the public transport is maintained for all types of activities (work, shopping and leisure) (see table 3 p. 58). Therefore, according to the obtained data from the survey, the actual motivation for the boulevard is not strong enough.

2) The survey results indicate the centre as transit place for those who travel from one district to another. This way, the status of the centre is maintained as a transit place. However, this is mostly because of the public network that passes through the centre. The analysis made for the master plan of 1989, shows also a big number of cars transiting the centre (see Figure 26, p. 66) (I.M. Chişinăuproiect, 1990). Now, because these tendencies are kept until nowadays, the scope of the planners should be to keep the number of transiting cars under control and lower it as much as possible. Transiting cars create additional charge on the roads' capacity and importantly contribute to traffic congestions. The fear is that, by building the Cantemir Boulevard, the transit will be even more encouraged.

3) The survey shows a knowledge gap between understanding the value of the historical centre and the support for the boulevard, if, eventually, it will start being built. This means that while most of the respondents answered that they understand the value of the historical centre (72%) when asked if they would support the building of the boulevard, they said, in majority, that they would (51.1%). This misunderstanding of knowledge about the value of the historical centre and wanting it demolished is curious. That could mean two things: (1) the people answered at the question about the value that they

understand it fearing not to be judged or (2) they do not entirely understand the value of the historical centre. However, this is relative, because as shown in the Data Analysis the opinions differ between those living in the centre and those living outside it. Nonetheless, taking into account the absolute majorities, it makes me conclude that the people were misled in this matter, while their knowledge about the meaning of a historical centre is poor. This, it turn, is not a news because, generally, the ordinary people, and even some architects, do not consider the lower central part as of any value (historical, architectural or archaeological). More, the medieval centre was always considered a shame for the city because of its provincial look (Țăranu, 2015).

Ultimately, the question that has driven this research is ***Will the Cantemir Boulevard reduce the traffic congestion in the city centre of Chisinau?*** Given the extensive work done for proving legitimacy for the Cantemir Boulevard by the field professionals for the Chisinau master plans of 1989 and 2006 (I.M. Chişinăuproiect, 1990; INCP Urbanproiect et al., 2006) – most probable it will reduce the traffic congestion in the city centre. However, the question that remains unanswered is whether the price the city is going to pay for reducing the traffic congestion in the centre is worth it. Most probable it is not. Another question is whether there is a real need for cutting a boulevard through the centre. The survey shows a perfectly even share of answers 50% to 50%. Now, the fact that the people do not understand until the end the consequences of such a project plays an important role for answering this question and that is why the even share. Nevertheless, most certainly, there is no need for the Cantemir Boulevard and, definitely, there are alternatives for solving the congestion of the centre (as I show later in this section). So, why there is no need for the boulevard? It is because:

- As shown by the survey, the people use mostly the public transport for traveling to the centre and overall the city and there is no need for making more space, especially, for personal cars;
- The people mostly walk through the centre and there is no need for making it more accessible for the automobile;
- In perspective it will bring even more cars in / through the centre, thus decreasing its inhabitants' life quality, even though for the first period the boulevard will seem efficiently working;
- At first, the city authorities and field professionals should think about solving the many problems that the public transportation network is facing (as shown by the survey) and work for improving it. Therefore, these problems should be put before solving the problems of the individual automobiles.
- It will destroy a tremendous amount of architectural monuments, heritage sites and the medieval street fabric thus, it will be flawing even more the image of the entire city and contribute to what Soviet regime started – to erase its identity;

The situation is, indeed, serious. Nonetheless, what can be done for passing and avoiding the rather difficult condition that the only the presence of the Cantemir Boulevard on official maps has created, without even mentioning its consequences in case of building it? Well, as Moldova is proud to be called a democratic state (after many years of oppression), its institutions are working for the well-being of the people they serve, thus its citizens. In such manner, the question of the boulevard should be raised by the people, as the officials and professionals do not always succeed to see the real problems that the people are facing. They oftentimes are reacting to certain needs or discomfort of the population according to some rules or regulations, which do not necessarily address the actual specific nature of the problem. Hence, they fail to solve the causes of the problems by only looking at its symptoms. In case of the Cantemir Boulevard, we have a very sensitive issue. Besides the historic centre, people's homes are endangered. One obvious aspect of the issue is that the scale of this project is largely misunderstood. This way, it is imperative for all the stakeholders involved in this project to be on the same level so that they can speak the same language to understand each other. The authorities and the planners need to understand the citizens for whom they are working and vice-versa. Transparency is another important aspect in this matter. The Cantemir Boulevard is a large-scale project whose beneficiaries are the citizens of Chisinau. Hence, they need, in first instance, to know the implication of the project, especially, should be considered those who will be directly affected by it – the once to be evicted. As we are talking about the old centre, they need to be aware about the place the boulevard is going to destroy as well as the meaning of this place for the city and, if not, for an entire nation. Should be mentioned the value of the objectives and places to be erased. Only in last instance should be put forward the benefits of such significant intervention in urban fabric. Then, it is up to the beneficiaries (the people) to decide whether they will or will not support the project. To reiterate, the value of the old centre lacks understanding.

Through research and driven by empirical knowledge, I have identified a number of alternatives, which would help decongesting the centre. These are recommendations that should be considered, however, a more in-depth analysis has to be carried out for each of them, in order to identify the best matching solution or an ensemble of them.

1. *Pedestrianisation of central streets* – a good way to improve the life quality of the inhabitants of the centre and the overall city. By expelling the cars from these streets with their consequent adaptation to pedestrians will be significantly improved the air quality and reduced the noise pollution created by the cars. Besides these, walkability has an economic value (Litman, 2014), it is healthy and sustainable. If realised, Chisinau will join many other cities from Europe, like Paris, Madrid, Brussels, Dublin and Milan that chose to expel the cars from their central streets and favour the people and walking (O'sullivan, 2015). One interesting idea to start pedestrianisation of central Chisinau was proposed by Ion Grosu. He proposes that instead of building the Cantemir Boulevard to organise in the same area (which coincides with the axis of the boulevard) a network of pedestrian streets (see Annex 3). The plan is to be realised in

several stages, gradually reaching the proposed objectives (Grosu, 2015). Another study / proposal was realised for the 2006 Chisinau master plan, the same plan that proposed the continuation of the Cantemir Boulevard “epic”. It is proposed that the central market to be connected with the Cathedral Square through a pedestrian street, which now is used by the automobiles (see Annex 5) (INCP Urbanproiect et al., 2006).

2. *New mass transit system* – there is a need to change the way the central part is accessed by the public transportation network. The proposal is, in order to protect the historical area and facilitate the accessibility of the centre, to install an independent public transportation network, which will service only the central part of the city. While the access to the centre will be assured through the so-called transport hubs, located at the peripheries of the centre that will be connected with the central network (a sketch can be seen in annex 4). In order to assure a fast transit and as short as possible travel time, the important aspect here is to dedicate special road lanes, accessible only to mass transit units (trolleybuses and buses). Through the centre, the network should also have special dedicated lanes, while it will be serviced by medium sized buses (favourably, on electric propulsion).

While, changing the whole public transport system might sound as an impossible challenge for the city authorities, even more knowing our mind set and the way of doing things, as a starting point is have dedicated bus and trolleybus lanes with the right of way. This will fluidise the public transport traffic, will reduce the travel time and will have an overall beneficial impact on the working efficiency of the network. Moreover, this is possible “thanks to” soviet planning and as a result the city has today very wide streets and boulevards in each district that can easily accommodate a special lane dedicated to public transport.

3. *Cycling paths network* – for a sustainable development a network of bicycle paths is essential and not just designed for leisure activities, as it is done for the Chisinau master plan, but mainly as an alternative mode of public transit.

4. *Parking fees* – today car parking throughout the centre is free. Even more, to solve the problem of parking in the centre, the city authorities dedicated parking space on the sidewalks. This, in its turn, seemed to be the solution in the beginning until the point when the number of cars became that big that even parking on the sidewalk did not help. In result, the pedestrians are deprived from their space and walking on the sidewalk is a complete adventure, not to mention that because of the cars, the sidewalks are in an advanced state of degradation and continues to do so. This way, the proposal is to organise special places where parking will be charged and increase their number, gradually, until an optimal number, at the same time to remove the permission for parking on the sidewalks and give it back to pedestrians. The system should be administered by the local authorities, which will directly benefit from the revenues to be reinvested in the city’s well-being.

5. *Valorisation of the historical centre* – to start a mass advertising and raising awareness campaigns to sensitise the public opinion about the value of the historical centre and the scale of intervention of the Cantemir Boulevard.

6. *Polycentric development* – to promote a developmental strategy towards decentralisation of the main activities in which the people are engaged like spreading the working places all over the city and avoiding their concentration in the central part. Maintain mostly attractions, which do not require a mass daily commute to the centre.

7. *Special administration* – to install a special administration / institution / department for the historical centre that will regulate, valorise and protect the area through specially elaborated means, like strictly monitoring the new constructions in order to maintain and safeguard the value of the centre.

8. *Alternative for transiting the centre* – for transiting the city it proposed to encourage the motorists to avoid the centre and to use the already existing, specially built, street – Calea Basarabiei, located on the other side of the river Bîc.

While these can be just a few modes for Chisinau to step towards a sustainable development, global knowledge share way vaster experiences from which examples can be taken and adapted, which in many cases are at the distance of a mouse click.

For a hundred years now, accommodating the car within cityscapes has given headaches to urban and transport planners. Although the planners still have headaches, today, a shift is taking place – the car is being expelled from the city. This is for good reason. Since its invention, the automobile mostly damaged the city (Bergeron, 1999)<sup>34</sup> and pushed the people to the sides of the streets to take over people's space. Now, while some researchers argue that a transport system cannot be seen without congestion and the discussion should be on what the level of congestion we should agree upon (Banister, 2008:74), others say that transport issues should be addressed as an ensemble, and solving public transport problems is not a universal answer to all transport problems (Pickrell, 1992; Richmond, 1998)<sup>35</sup>. There is, however, a third perspective, which is completely radical, and asks who, generally, needs cars, when the future we want and need is one of smart sustainable cities, where new technologies are socially, environmentally, and financially sustainable (Guislain, 2015).

These being said, it is clear what the alternatives are. It is just a matter of seizing them at the right moment.

---

<sup>34</sup> Cited in (Dupuy, 2011)

<sup>35</sup> Cited in (Marshall, 2001)

## IV. APPENDIXES

### *Annex 1. Architectural monuments to be demolished if the Cantemir Boulevard will be built*

Address and function	Importance	Photo
<p><b>1. str. Bălănescu, 46 A,B</b>  <i>Private and tenement houses</i>                      Mid. XIX century / end. XIX century</p>	<p>Local</p>	
<p><b>2. Avram Iancu, 29 A,B,C,D</b>  <i>Building of a former primary school</i>                      Beginning of XIX century</p>	<p>Local</p>	
<p><b>3. str. Avram Iancu, 31</b>  <i>Private house</i>                      End of XIX century</p>	<p>Local</p>	
<p><b>4. str. Avram Iancu, 40</b>  <i>Private house</i>                      End of XIX century</p>	<p>Local</p>	

<p><b>5. str. Avram Iancu, 42</b> <i>Parsonage</i> End of XIX century</p>	<p>Local</p>	
<p><b>6. str. Cojocarilor, 9</b> <i>Building of the former Primary School of the Secondary Stores' Staff Society of Mutual Aid</i> End of XIX century</p>	<p>Local</p>	
<p><b>7. Octavian Goga, 7</b> <i>Residential house / Urban mansion</i> Beginning of XX century</p>	<p>Local</p>	
<p><b>8. str. Armenească, 77</b> <i>Public building</i> Beginning of XX century</p>	<p>Local</p>	
<p><b>9. Octavian Goga, 13</b> <i>Building with commercial units</i> Beginning of XX century</p>	<p>Local</p>	

<p><b>10. Octavian Goga, 14 A, B</b> <i>Individual House</i> Second half of XIX century</p>	<p>Local</p>	
<p><b>11. Alexandru Vlăhuță, 3</b> <i>Individual House</i> '80s of the XIX century</p>	<p>Local</p>	
<p><b>12. Alexandru Vlăhuță, 5</b> <i>Individual House</i> '80s of the XIX century</p>	<p>Local</p>	

<p><b>13. Octavian Goga, 20 A, B</b></p> <p><i>Monastic clergy administering estates "dedicated to St. Athos' Mountain"</i></p> <p>Second half of XIX century</p>	<p>Local</p>	
<p><b>14. str. Octavian Goga, 22</b></p> <p><i>Furniture workshop</i></p> <p>End of XIX century</p>	<p>Local</p>	
<p><b>15. Octavian Goga, 26</b></p> <p><i>Individual House</i></p> <p>End of XIX century</p>	<p>Local</p>	
<p><b>16. Octavian Goga, 33</b></p> <p><i>Tenement house with commercial units</i></p> <p>Mid. of XIX century</p>	<p>Local</p>	

<p><b>17. Sf. Andrei, 19</b> <i>Individual House</i> End of XIX century</p>	<p>Local</p>	
<p><b>18. Sf. Andrei, 28</b> <i>Tenement house</i> End of XIX century</p>	<p>Local</p>	

**Sources:**

Photos: *monument.sit.md*

Address and function: *Chisinau City Council, Decision no. 2/6 from January 12, 1995, Concerning the protection of monuments of national and municipal importance.*

**Annex 2.** Questionnaire for studying mobility within and out the Cantemir Boulevard neighbourhood

<b>Are you from the neighbourhood (city centre)?</b>	Yes
	No

**If YES**

<b>1. Do you know that this is the oldest part of the city?</b>	a. Yes	
	b. No	
<b>2. Do you understand its historic value?</b>	a. Yes	
	b. No	
	c. Somehow	
<b>3. How do you move around the neighbourhood?</b>	a. Personal car	
	b. Public transport	
	c. Bicycle	
	d. Walk	
<b>4. How often do you travel to other parts of the city?</b>	a. Daily	
	b. Weekly	
	c. Monthly	
	d. Rarer	
<b>5. How do you travel to other city neighbourhoods?</b>	a. Personal car	
	b. Public transport	
	c. Bicycle	
	d. Walk	
<b>6. How often you use public transportation in the city?</b>	a. Daily	
	b. Weekly	
	c. Monthly	
	d. Rarer	
<b>7. Do you think that the public transportation system works efficiently in the city?</b>	a. Yes	
	b. No – explain	
<b>8. What is your occupation?</b>	a. Work	
	b. Study	
	c. At home	
	<b>8.1. Where do you work / study?</b>	
	a. In the Centre	
	b. Outside Centre	
	<b>8.2. How much time it takes you to commute there?</b>	
	a. < 20 min	
	b. 20-40 min	
	c. > 40 min	
<b>8.3. How do you travel there?</b>		
a. Personal car		
b. Public transport		
c. Bicycle		
d. Walk		
<b>9. Where do you take the children to kindergarten / school?</b>	a. In the Centre	
	b. Outside Centre	
	<b>9.1. How much time it takes you to commute there?</b>	
a. < 20 min		
b. 20-40 min		

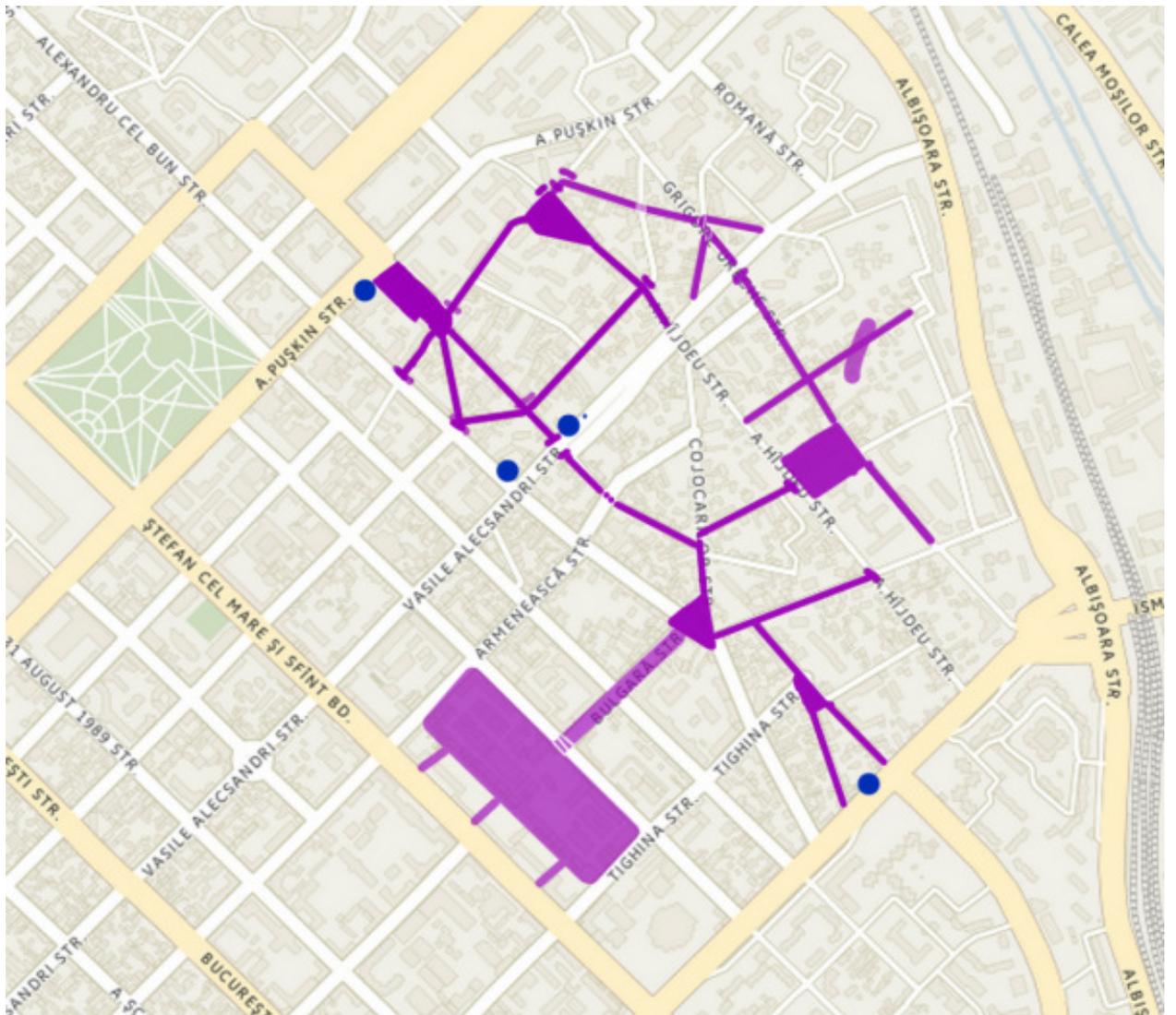
		c. > 40 min
	<b>9.2. How do you travel there?</b>	a. Personal car
		b. Public transport
		c. Bicycle
		d. Walk
<b>10. Where do you shop?</b>		a. In the Centre
		b. Outside Centre
<b>10.1. How much time it takes you to commute there?</b>		a. < 20 min
		b. 20-40 min
		c. > 40 min
<b>10.2. How do you travel there?</b>		a. Personal car
		b. Public transport
		c. Bicycle
		d. Walk
<b>11. Where do you spend your recreation time?</b>		a. In the Centre
		b. Outside Centre
<b>11.1. How much time it takes you to commute there?</b>		a. < 20 min
		b. 20-40 min
		c. > 40 min
<b>11.2. How do you travel there?</b>		a. Personal car
		b. Public transport
		c. Bicycle
		d. Walk
<b>12. Do you own a car?</b>		a. Yes
		b. No
<b>13. What do you use it mostly for?</b>		a. Travel within the city
		b. Travel outside the city
<b>14. Do you know that there is plan to build a boulevard through the neighbourhood?</b>		a. Yes
		b. No
<b>15. Do you think there is a need for one, considering that it would cut through the old-historical core and would demolish buildings and evacuate people?</b>		a. Yes
		b. No
<b>16. What do you think about it?</b>		a. Totally support
		b. Support
		c. Indifferent
		d. Against
		e. Totally against
<b>17. How old are you?</b>		a. < 30 years
		b. 30-50 years
		c. > 50 years
<b>18. Sex:</b>		M
		F

**If NO**

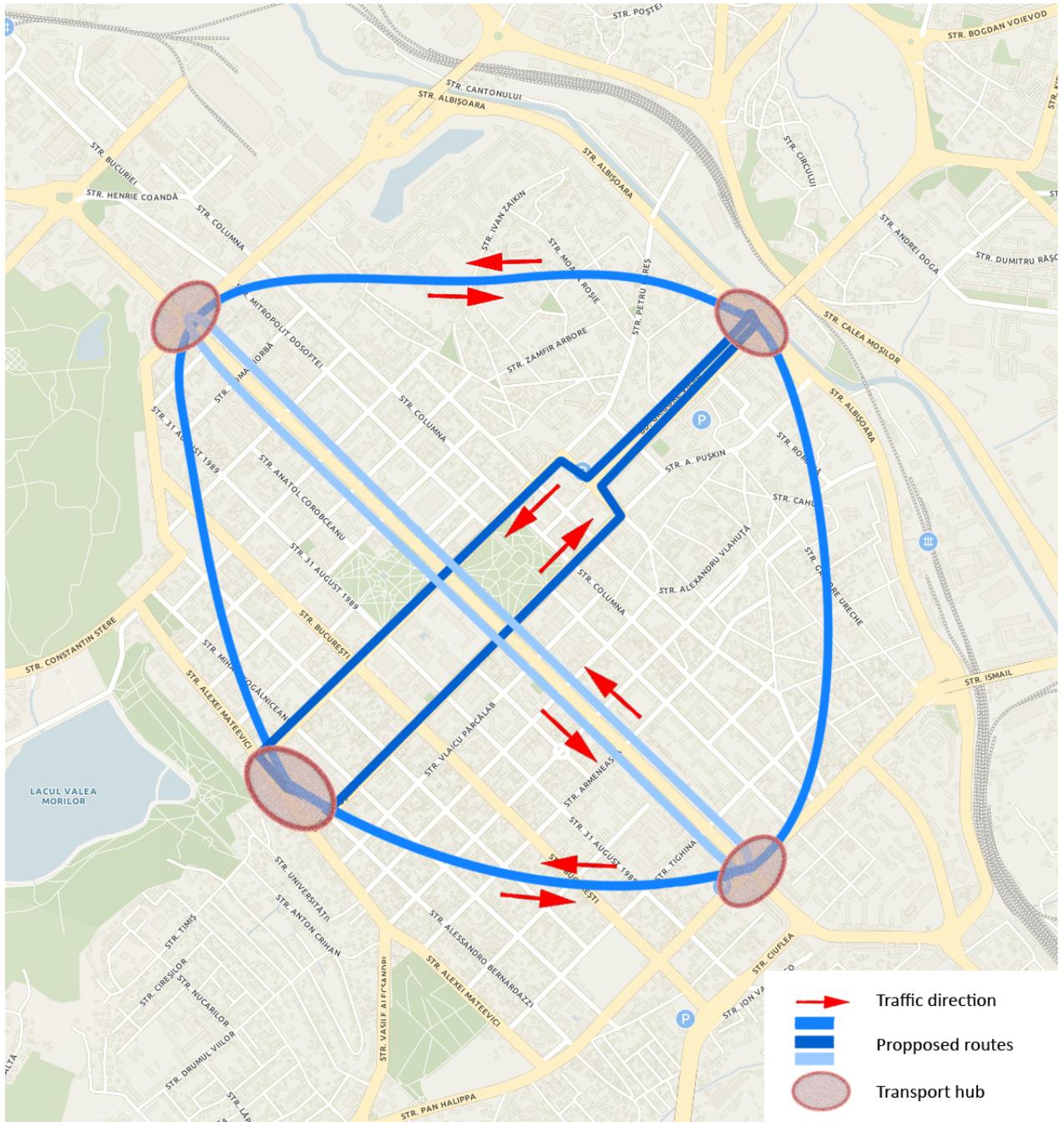
1.	<b>Do you know that this is the oldest part of the city?</b>	a. Yes
		b. No
2.	<b>Do you understand its historic value?</b>	a. Yes
		b. No
		c. Somehow
3.	<b>How often you come to the city centre?</b>	a. Several and more times a week
		b. Once a week
		c. Rarer
4.	<b>How do you travel here?</b>	a. Personal car
		b. Public transport
		c. Bicycle
		d. Walk
5.	<b>Why do you come to city the centre (what for)?</b>	
6.	<b>What is your occupation?</b>	a. Work
		b. Study
		c. At home
6.1.	<b>Where do you work / study?</b>	a. In the Centre
		b. Outside Centre
6.2.	<b>How much time it takes you to commute to work?</b>	a. < 20 min
		b. 20-40 min
		c. > 40 min
6.3.	<b>How do you travel there?</b>	a. Personal car
		b. Public transport
		c. Bicycle
		d. Walk
7.	<b>Where do you take children to kindergarten / school?</b>	a. In the Centre
		b. Outside Centre
7.1.	<b>How much time it takes you to commute there?</b>	a. < 20 min
		b. 20-40 min
		c. > 40 min
7.2.	<b>How do you travel there?</b>	a. Personal car
		b. Public transport
		c. Bicycle
		d. Walk
8.	<b>Where do you shop?</b>	a. In the Centre
		b. Outside Centre
8.1.	<b>How much time it takes you to commute there?</b>	a. < 20 min
		b. 20-40 min
		c. > 40 min
8.2.	<b>How do you travel there?</b>	a. Personal car
		b. Public transport
		c. Bicycle
		d. Walk
		a. In the Centre

9.	<b>Where do you spend your recreation time?</b>	b. Outside Centre
	9.1. How much time it takes you to commute there?	a. < 20 min
		b. 20-40 min
c. > 40 min		
9.2. How do you travel there?	a. Personal car	
	b. Public transport	
	c. Bicycle	
	d. Walk	
10. If you need to travel to other neighbourhood than Centre, how do you go there?	a. Personal car	
	b. Public transport	
	c. Bicycle	
	d. Walk	
11. Is it always through the centre?	a. Yes	
	b. No	
12. Why do you prefer that?	a. Faster	
	b. More pleasant	
	c. There are no other ways	
	d. I do not know another way	
	e. Less / more traffic jams	
13. Are there alternatives for the routes you usually choose?	a. Yes	
	b. No	
	c. I do not know	
14. Would you avoid the centre if it was possible?	a. Yes	
	b. No	
15. Do you think that the public transportation system works efficiently in the city?	a. Yes	
	b. If NO – explain	
16. Do you own a car?	a. Yes	
	b. No	
17. What do you use it mostly for?	a. Travel within the city	
	b. Travel outside the city	
18. Do you know that there is plan to build a boulevard through the neighbourhood?	a. Yes	
	b. No	
19. Do you think there is a need for one, considering that it would cut through the old-historical core and would demolish buildings and evacuate people?	a. Yes	
	b. No	
20. What do you think about it?	a. Totally support	
	b. Support	
	c. Indifferent	
	d. Against	
	e. Totally against	
21. How old are you?	a. < 30 years	
	b. 30-50 years	
	c. > 50 years	
22. Sex:	M	
	F	

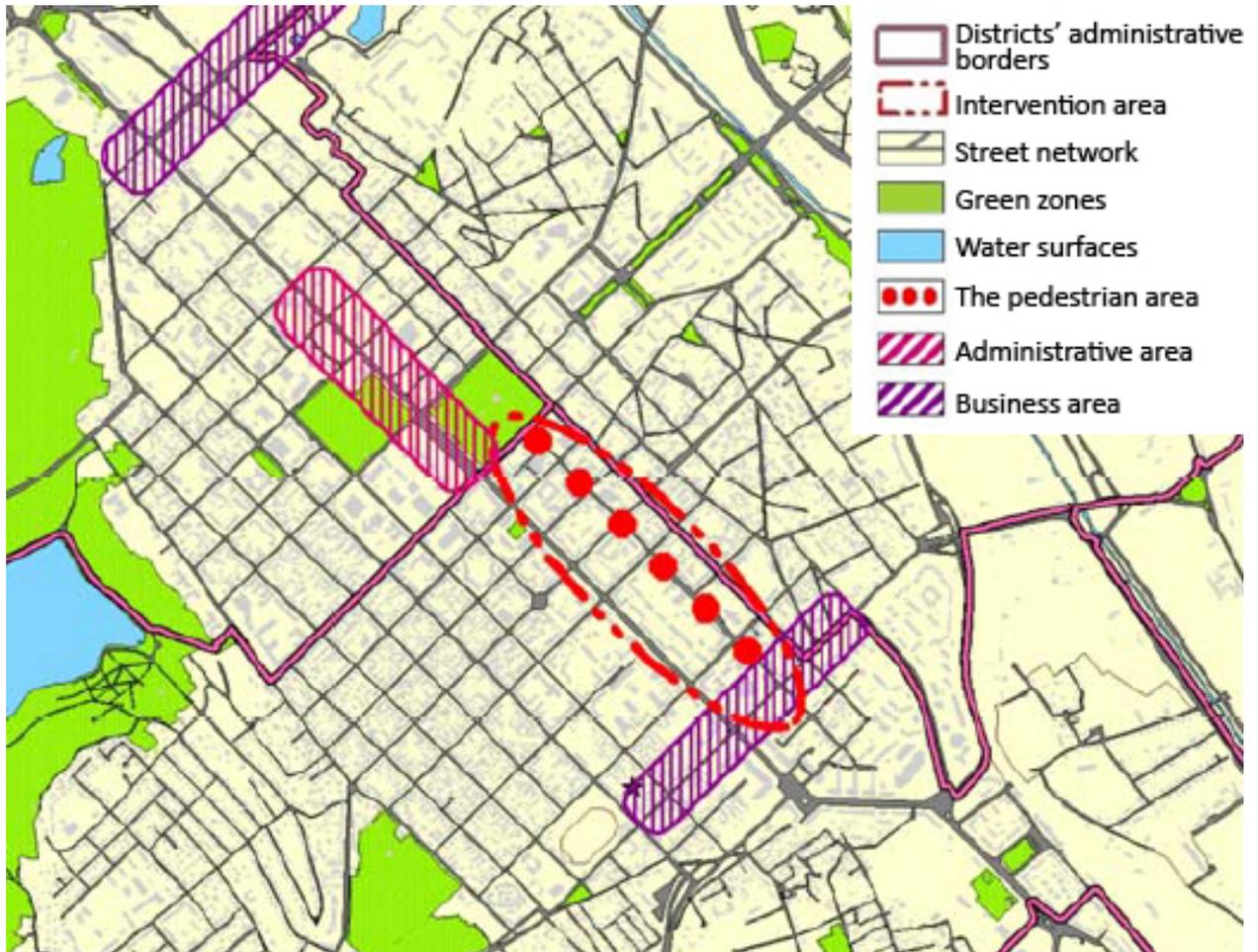
**Annex 3.** The plan for pedestrianisation of Chisinau city centre.  
Source: (Grosu, 2015)



**Annex 4.** The sketch for a new public transport system through the centre of Chisinau  
Map source: point.md



**Annex 5.** Proposal from the 2006 master plan of Chisinau to pedestrianize a street in the central Chisinau.  
Source: (INCP Urbanproiect et al., 2006)



## V. BIBLIOGRAPHY

- (1984) Генеральные планы Кишинева (General Plans of Chisinau. In: TIMUSH, A. I. (ed.) *Кишинев (Chisinau)*. Chisinau: Main Redaction of the Soviet Moldova Encyclopedia
- ACTIVEMWATCH.RO. (2013) *Justiția s-a pronunțat: Hala Matache a fost demolată ilegal de Oprescu (Justice decided: Matache Hall was demolished illegally by Oprescu)* [Online]. Available: <http://www.activemwatch.ro/ro/buna-guvernare/reactie-rapida/justitia-s-a-pronuntat-hala-matache-a-fost-demolata-ilegal-de-oprescu>.
- ARDRM (2005) NCM B.01.01 – 2005. *Territorial and settlements planning. Terms and definitions*. Chisinau: Agency for Regional Development of the Republic of Moldova.
- ARHIFORUM.RO. (2011) *Analiză critică a Planului Urbanistic Zonal pentru Diametrala Buzzești-Berzei-Uranus comandat de Primăria Municipiului București (Critical analysis of the Zoning Plan for Buzzești-Berzei-Uranus axis ordered by Bucharest City Hall)* [Online]. Available: <http://www.arhiforum.ro/agora/analiza-critica-planului-urbanistic-zonal-pentru-diametrala-buzesti-berzei-uranus-comandat-de-> [Accessed Aug 9 2015].
- ATEM. (1965) Chisinau tomorrow. Was approved the main project for the general plan of the capital *Soviet Moldova*, Sept 2, 1965.
- BAGHDASARYAN, N. (2013) *Social Protests in Armenia: Econometric Analysis and Theoretical Interpretation*. Master's of Arts Master essay, American University of Armenia.
- BANISTER, D. (2005) *Unsustainable transport: city transport in the new century*, Taylor & Francis.
- BANISTER, D. (2008) The sustainable mobility paradigm. *Transport Policy*, 15, 73-80.
- BANISTER, D. (2011) Cities, mobility and climate change. *Journal of Transport Geography*, 19, 1538-1546.
- BARTON, H. (1998) Eco-neighbourhoods: A review of projects. *Local Environment*, 3, 159-177.
- BELLIS, M. (n.d.) *The History of the Automobile* [Online]. Available: <http://inventors.about.com/library/weekly/aacarssteama.htm> [Accessed 23 May 2015].
- BERGER, M. (2004) Les périurbains de Paris: de la ville dense à la métropole éclatée. Paris: CNRS Éditions.
- BERGERON, R. (1999) *Le livre noir de l'automobile: exploration du rapport malsain de l'homme contemporain à l'automobile*, Éditions Hypothèse.
- BERTOLINI, L. & LE CLERCQ, F. (2003) Urban development without more mobility by car ? Lessons from Amsterdam, a multimodal urban region (English). *Environment & planning A (Print)*, 35, 575-589.
- BOLDESCO, A. (2015) Interview on Cantemir Boulevard. In: MUNTEANU, A. (ed.) *Master's thesis preparations*. Grenoble.
- BUEHLER, R. (2014) *9 Reasons the U.S. Ended Up So Much More Car-Dependent Than Europe* [Online]. Available: <http://www.citylab.com/commute/2014/02/9-reasons-us-ended-so-much-more-car-dependent-europe/8226/> [Accessed June 5 2015].
- BURDEN, D. & LAGERWEY, P. (1999) Road Diets Losing width and gaining respect. *ITE Journal*, 2-15.
- CALTHORPE, P. (1993) *The next American metropolis: Ecology, community, and the American dream*, Princeton Architectural Press.
- CAȘU, I. (2011) The city of Chisinau in the Soviet era: general considerations. In: RUSU, S. (ed.) *Chisinau - Art, Research in the Public Sphere* Chisinau: [KSA:K].
- CERVERO, R. (2009) Public Transport and Sustainable Urbanism: Global lessons. In: CAREY CURTIS, JOHN L. RENNE & BERTONI, L. (eds.) *Transit Oriented Development. Making it Happen*. England Ashgate.
- CERVERO, R., TRANSIT COOPERATIVE RESEARCH PROGRAM, UNITED STATES. FEDERAL TRANSIT ADMINISTRATION, NATIONAL RESEARCH COUNCIL. TRANSPORTATION RESEARCH BOARD & TRANSIT DEVELOPMENT CORPORATION (2004) *Transit-oriented Development in the United States: Experiences, Challenges, and Prospects*, Transportation Research Board.
- The Safest Place*, (1935). Directed by CHEVROLET.
- CIOBANU, Ș. (1996) *Chişinăul*, Chişinău.
- CUTLER, S. J. (1975) Transportation and changes in life satisfaction. *The Gerontologist*, 15, 155-159.
- DENSCOMBE, M. (2003) The good research guide: for small scale social projects. *Maidenhead, PA: Open University*.
- DICTIONARY.COM. (2015) *Dictionary.com Unabridged* [Online]. Available: <http://dictionary.reference.com/browse/sustainability> [Accessed Jun 15 2015].

- DODSON, J. & SIPE, N. (2007) Oil vulnerability in the Australian city: assessing socioeconomic risks from higher urban fuel prices. *Urban Studies*, 44(1), 37-62.
- DUPUY, G. (2011) *Towards Sustainable Transport: The Challenge of Car Dependence* John Libbey Eurotext.
- DUPUY, J. P. & ROBERT, J. (1976) *La trahison de l'opulence*, Presses universitaires de France.
- ERASO, M. & ANDREASSIAN, K. (2007) Transition. *Third Text*, 21, 577-588.
- EREMIA, A. (1998) *Chişinău: The Old and New City*, Chişinău, Litera.
- EUROPEAN COMMISSION. *Horizon 2020. Transport* [Online]. Available: <http://ec.europa.eu/programmes/horizon2020/en/area/transport#Article> [Accessed 5 Feb 2015].
- EUROPEAN COMMISSION (2011a) *Cities of tomorrow - Challenges, visions, ways forward*, Luxembourg, Publications Office of the European Union.
- EUROPEAN COMMISSION (2011b) Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system.
- EUROPEAN COMMISSION. (2014) *Innovation Union* [Online]. Available: [http://ec.europa.eu/research/innovation-union/index\\_en.cfm](http://ec.europa.eu/research/innovation-union/index_en.cfm) [Accessed 5 Feb 2015].
- GHENCIULESCU, S. (2011) An axis meant to take cars off the historical centre. *Zeppelin*. Bucharest.
- GORZ, A. (1973) The social ideology of the motorcar. *Le Sauvage*.
- GÖSSLING, S. (2013) Urban transport transitions: Copenhagen, City of Cyclists. *Journal of Transport Geography*, 33, 196-206.
- GREEN CAR CONGRESS. (2015) *IHS forecasts global EV charger market to grow to more than 12.7M units in 2020* [Online]. Available: <http://www.greencarcongress.com/2015/05/20150528-ih.html> [Accessed June 20 2015].
- GROSU, I. (2015) *Proiectul Cosmos: Chişinăul vechi valorificat (Cosmos Project: the old Chisinau valorised)* [Online]. Available: <http://iongrosu.md/2015/03/25/proiectul-cosmos-chisinaul-vechi-valorificat/>.
- GUISLAIN, P. (2015) *Who needs cars? Smart mobility can make cities sustainable* [Online]. The World Bank. Available: <http://blogs.worldbank.org/transport/who-needs-cars-smart-mobility-can-make-cities-sustainable> [Accessed 15 Aug 2015].
- HALL, P. G. & PAIN, K. (2006) *The polycentric metropolis: learning from mega-city regions in Europe*, Routledge.
- HARDMAN, S., STEINBERGER-WILCKENS, R. & VAN DER HORST, D. (2013) Disruptive innovations: The case for hydrogen fuel cells and battery electric vehicles. *International Journal of Hydrogen Energy*, 38, 15438-15451.
- HISTORY.COM. (2010) *Automobiles* [Online]. A+E Networks. Available: <http://www.history.com/topics/automobiles> [Accessed 23 May 2015].
- HIVERT, L. & PÉAN DE PONFILLY, J. (2000) Inégalités d'accès à l'automobile, disparités d'équipement et d'usage entre les ménages les plus pauvres et les plus riches. Arcueil: INRETS.
- HOCKENOS, P. (2013) *Where 'Share the Road' Is Taken Literally* [Online]. The New York Times Available: [http://www.nytimes.com/2013/04/28/automobiles/where-share-the-road-is-taken-literally.html?\\_r=1](http://www.nytimes.com/2013/04/28/automobiles/where-share-the-road-is-taken-literally.html?_r=1) [Accessed Aug 10 2015].
- HOPPE, M. & CHRIST, A. (2014) The Transformation of Transportation: Which Borders Will We Have to Cross in the Future? *Global Studies Journal*, 7, 1-12.
- I.M. CHIŞINĂU PROIECT (1990) Chisinau. Schema Complexa de transport (*Chisinau's Complex Transports Scheme*). In: I.M. CHIŞINĂU PROIECT (ed.). Chisinau.
- I.M.P. CHIŞINĂU PROIECT (2010) Schema Complexa de Transporturi din Chisinau (*Chisinau's Complex Transports Scheme*). In: CHIŞINĂU PROIECT, I. M. P. (ed.). Chisinau.
- IANOVICI, A. (2014) *În capitală ca la țară (The capital like the countryside)* [Online]. Chişinău. Available: <http://www.europalibera.org/media/video/26699806.html> [Accessed July 20, 2015].
- INCP URBAN PROIECT, IHS ROMANIA SRL, BUSSINES CONSULTING INSTITUTE, S.C. LINIA NOVA SRL, I.U. BELNIIGRADOSTROITELISTVA & I.M.P. CHIŞINĂU PROIECT (2006) Planul Urbanistic General al mun. Chisinau (*Chisinau Master Plan*). In: INCP URBAN PROIECT (ed.). Chisinau.
- INFOO.RO. (2014) *Harta cu noul bulevard Buzesti-Berzei-Uranus si sensurile unice noi (Map with the new Buzesti-Berzei Boulevard and the new one way streets)* [Online]. Available:

- <http://www.infoo.ro/Bucuresti-%7C-Harta-cu-noul-bulevard-Buzesti-Berzei-Uranus-si-sensurile-unice-noi-MD142725UC.html> [Accessed Aug 9 2015].
- IVANOV, C. (2010) *Bucuresti: Joi seara a inceput demolarea caselor de pe Bulevardul Buzesti (Bucharest: On thursday night began the demolition on Buzesti Boulevard)* [Online]. Available: [http://economie.hotnews.ro/stiri-ultima\\_ora-8028274-bucuresti-joi-seara-inceput-demolarea-caselor-bulevardul-buzesti.htm](http://economie.hotnews.ro/stiri-ultima_ora-8028274-bucuresti-joi-seara-inceput-demolarea-caselor-bulevardul-buzesti.htm).
- KAY, D. (2011) *Fairness in a car-dependent society*. United Kingdom: Sustainable Development Commission.
- KENWORTHY, J. (2010) An International Comparative Perspective on Fast Rising Motorisation and Automobile Dependence in Developing Cities. In: DIMITRIOU, H. & GACKENHEIMER, R. (eds.) *Transport Policy Making and Planning for Cities of the Developing World*. London: Edward Elgar.
- KENWORTHY, J. R. & LAUBE, F. B. (1999) Patterns of automobile dependence in cities: an international overview of key physical and economic dimensions with some implications for urban policy. *Transportation Research Part A: Policy and Practice*, 33, 691-723.
- KOLODINSKY, J. M., DESISTO, T. P., PROPEN, D., PUTNAM, M. E., ROCHE, E. & SAWYER, W. R. (2013) It is not how far you go, it is whether you can get there: modeling the effects of mobility on quality of life in rural New England. *Journal of Transport Geography*, 31, 113-122.
- KOLOTOVKIN, A. V., SHOIKHET, S. M. & ELTMAN, I. S. (1987) *Architecture of the Soviet Moldavia*, Stroiizdat.
- KOTHARI, C. (2004) *Research methodology: Methods and techniques*, New Age International.
- LAROUSSE. "boulevard" [Online]. Éditions Larousse. Available: <http://goo.gl/teifQK> [Accessed June 14 2015].
- LITMAN, T. A. (2014) *Economic Value of Walkability*. Victoria Transport Policy Institute.
- MARSHALL, S. (2001) The challenge of sustainable transport. In: LAYARD, A., DAVOUDI, S. & BATTY, S. (eds.) *Planning for a Sustainable Future*. London: Spon Press
- MCINTOSH, J., TRUBKA, R., KENWORTHY, J. & NEWMAN, P. (2014) The role of urban form and transit in city car dependence: Analysis of 26 global cities from 1960 to 2000. *Transportation Research Part D: Transport and Environment*, 33, 95-110.
- MEŞTER, M. (2015) *Germania a deschis primul punct de alimentare cu hidrogen de pe Autobahn* [Online]. Available: <http://www.automarket.ro/stiri/germania-a-deschis-primul-punct-de-alimentare-cu-hidrogen-de-pe-autobahn-62593.html> [Accessed June 2015 2015].
- MIRON, V. (2007) *Studiu privind patrimoniul construit în mun. Chişinău (A study regarding the built heritage in Chisinau)*. Chisinau: Business Consulting Institute.
- MOLLENKOPF, H., MARCELLINI, F., RUOPPILA, I., SZÉMAN, Z. & TACKEN, M., (EDS.), (2005) *Enhancing Mobility in Later Life*, Amsterdam, IOS Press.
- MOTTE-BAUMVOL, B., MASSOT, M. H. & BYRD, A. M. (2010) Escaping car dependence in the outer suburbs of Paris (English). *Urban studies (Harlow)*, 47, 604-619.
- MUMFORD, L. (1964) *The highway and the city*, Secker & Warburg.
- NATIONAL BUREAU OF STATISTICS OF THE RM. (2014) *The average age of the population, at the beginning of the year in Districts / Regions, Years and Sex* [Online]. Available: <http://statbank.statistica.md/pxweb/Dialog/Saveshow.asp> [Accessed July 30, 2015].
- NESTEROV, T. (2010) Oraşul Chişinău: scurt istoric. In: GANGAL, B., NESTEROV, T., RĂBALCO, E., STAROSTENCO, P. & NAZAROV, A. (eds.) *Centrul istoric al Chişinăului la începutul secolului al XXI-lea*. Chişinău: Editura Arc.
- NESTEROV, T. (2011a) Architecture between the two World Wars. In: RUSU, S. (ed.) *Chisinau - Art, Research in the Public Sphere* Chisinau: [KSA:K].
- NESTEROV, T. (2011b) The implementation of socialist realism in post-war Chisinau. Projects and achievements. In: RUSU, S. (ed.) *Chisinau - Art, Research in the Public Sphere* Chisinau: [KSA:K].
- NEWMAN, I. & BENZ, C. R. (1998) *Qualitative-quantitative research methodology: Exploring the interactive continuum*, SIU Press.
- NEWMAN, P. & KENWORTHY, J. (1999) *Sustainability and cities: overcoming automobile dependence*, Island Press.
- NORTON, P. D. (2008) *Fighting traffic: The dawn of the motor age in the American city*, Cambridge, MA, US, MIT Press.

- O'SULLIVAN, F. (2015) *The Plan to Pedestrianize Central Milan* [Online]. CityLab. Available: [http://www.citylab.com/commute/2015/07/the-plan-to-pedestrianize-central-milan/398387/?utm\\_source=SFTwitter](http://www.citylab.com/commute/2015/07/the-plan-to-pedestrianize-central-milan/398387/?utm_source=SFTwitter) [Accessed Aug 15 2015].
- OATMAN-STANFORD, H. (2014) *Murder Machines: Why Cars Will Kill 30,000 Americans This Year* [Online]. Available: <http://www.collectorsweekly.com/articles/murder-machines/> [Accessed 17 May 2015].
- OPRESCU, S. (2014) *Tronsonul Buzeşti-Berzei (The Buzesti-Berzei Section)* [Online]. Available: <http://sorinoprescu.ro/proiecte/diametrala-buzesti-berzei-uranus> [Accessed Aug 9 2015].
- OXFORD DICTIONARIES "boulevard". *Oxford Dictionaries*, Oxford University Press.
- PICKRELL, D. H. (1992) A desire named streetcar: fantasy and fact in rail transit planning. *J. Am. Plan. Assoc.*, 58, 158-176.
- POPESCU. (2010) *Buzesti – Berzei – Uranus, bulevard nou (Buzesti – Berzei – Uranus, new boulevard)* [Online]. Available: <http://www.ideiurbane.ro/buzesti-berzei-uranus-bulevard-nou/> [Accessed Aug 9 2015].
- PUBLIKA.MD. (2014) *Săraci, dar cu maşini: Numărul autovehiculelor înregistrate în Moldova este în creştere (Poor, but with cars: The number of cars registered in Moldova is growing)* [Online]. Available: [http://www.publika.md/saraci--dar-cu-masini--numarul-autovehiculelor-inregistrate-in-moldova-este-in-crestere\\_2156551.html](http://www.publika.md/saraci--dar-cu-masini--numarul-autovehiculelor-inregistrate-in-moldova-este-in-crestere_2156551.html) [Accessed Aug 6 2015].
- RAIDEN. (2010) *Buzesti-Berzei requiem* [Online]. Available: <http://rezistenta.net/2010/11/buzesti-berzei-recviem-1.html> [Accessed 9 Aug 2015].
- REALITATEA.NET. (2013) *Bucureşti: Primăria a început demolarea Halei Matache (Bucharest: the City Hall began the demolition of Hala Matache)* [Online]. Available: [http://www.realitatea.net/bucuresti-primaria-a-inceput-demolarea-halei-matache\\_1143461.html](http://www.realitatea.net/bucuresti-primaria-a-inceput-demolarea-halei-matache_1143461.html) [Accessed 9 Aug 2015].
- RICHMOND, J. R. (1998) *New rail transit investments. A review*. Cambridge, MA: Taubman Center for State and Local Government, John F. Kennedy School of Government.
- SAINCIUC, L. (2014) *Chişinăul ascuns sau o încercare de resuscitare a memoriei unui oraş*, Chişinău, Editura Lumina
- SAUVY, A. (1968) *Les quatre roues de la fortune: essai sur l'automobile*, Paris.
- SAVA, L. (2011) *Between tradition and modernity: Chisinau in the period between 1812 and 1918*. In: RUSU, S. (ed.) *Chisinau - Art, Research in the Public Sphere* Chisinau: [KSA:K].
- SINGH, Y. K. (2006) *Fundamental of research methodology and statistics*, New Age International.
- ŞLAPAC, M. (2008) *Arta urbanismului în Republica Moldova: privire de ansamblu*, Academia de Ştiinţe a Moldovei.
- SSX & LDA (2011) *Abordare strategică a traficului în Bucureşti (studiu de caz Buzeşti - Berzei) (Strategic approach to traffic in Bucharest (case study Buzeşti - Berzei))*. In: PLATFORMA PENTRU BUCUREŞTI (ed.) *O viziune alternativă la diametrala Buzeşti-Berzei-Uranus (An alternative vision to Buzeşti -Berzei -Uranus axis)*. Bucharest.
- ȚĂRANU, A. (2015) *Interview on Cantemir Boulevard* In: MUNTEANU, A. (ed.) *Master's thesis preparations*. Grenoble.
- TER-GHAZARYAN, D. K. (2013) "Civilizing the city center": symbolic spaces and narratives of the nation in Yerevan's post-Soviet landscape. *Nationalities Papers*, 41, 570-589.
- THE CONNEXION. (2010) *Paris has Europe's worst traffic jams* [Online]. Available: <http://www.connexionfrance.com/Paris-traffic-jams-worst-Europe-London-Lyon-Peripherique-bouchons-Sytadin-12233-view-article.html> [Accessed 6 Aug 2015].
- ȚICU, O. (2011) *Chisinau between the two World Wars*. In: RUSU, S. (ed.) *Chisinau - Art, Research in the Public Sphere* Chisinau: [KSA:K].
- TOYOTA. (2015) *The Toyota Mirai* [Online]. Available: <http://www.toyota.com/mirai/fcv.html> [Accessed June 20 2015].
- TRANSIT ORIENTED DEVELOPMENT INSTITUTE. *Transit Oriented Development* [Online]. Alexandria, VA. Available: <http://www.transitorienteddevelopment.org/tod.html> [Accessed June 23 2015].
- UNITED NATIONS. (2014) *World's population increasingly urban with more than half living in urban areas* [Online]. New York. [Accessed June 22 2015].

- UNITED NATIONS. (n.d.) *What is Sustainability?* [Online]. United Nations Available: <http://www.un.org/en/sustainablefuture/sustainability.shtml> [Accessed Jun 15 2015].
- URRY, J. (2011) Does Mobility Have a Future? In: GRIECO, M. & URRY, J. (eds.) *Mobilities: new perspectives on transport and society*. Ashgate Publishing Limited.
- US, V. (2012) *Mapping of Public Space in Chişinău workshop* [Online]. Oberliht. Available: <https://chisineu.wordpress.com/proiecte/atelier-cartografiere/> [Accessed July 23 2015].
- US, V. (2013) *CHISINAU CIVIC CENTER – beyond the red lines* [Online]. Oberliht. Available: <https://chisineu.wordpress.com/proiecte/ccc-liniile-rosii/> [Accessed July 23 2015].
- USSR STATE BUILDING (1989) СНиП 2.07.01-89\* (SNIП). *Planning and construction of urban and rural settlements*. Moscow.
- VALCOV, V. (2015) Number of carried passengers by public transport. Chisinau: National Bureau of Statistics of the RM,.
- VALE, D. S. (2015) Transit-oriented development, integration of land use and transport, and pedestrian accessibility: Combining node-place model with pedestrian shed ratio to evaluate and classify station areas in Lisbon. *Journal of Transport Geography*, 45, 70-80.
- VAN DER ZEE, R. (2015) *How Amsterdam became the bicycle capital of the world* [Online]. The Guardian. Available: <http://www.theguardian.com/cities/2015/may/05/amsterdam-bicycle-capital-world-transport-cycling-kindermoord> [Accessed Aug 10 2015].
- WEINGROFF, R. F. (1996) *Federal Aid Road Act of 1916: Building the Foundation* [Online]. Public Roads Magazine. Available: <http://www.fhwa.dot.gov/publications/publicroads/96summer/p96su2.cfm> [Accessed 29 May 2015].
- WIRTH, L. (1938) Urbanism as a Way of Life. *American Journal of Sociology*, 44, 1-24.
- WORLD BANK (1994) Indicators Programme. Monitoring Human Settlements. World Bank.
- YALACHKOV, Y., NAUMER, M. J. & PLYUSHTEVA, A. (2014) The compulsive habit of cars. *Trends in Cognitive Sciences*, 18, 227-228.