

THE INFLUENCE OF THE PUBLIC PASSENGER TRANSPORT SYSTEM ON THE QUALITY OF URBAN LIFE. STUDY CASE: BUCHAREST

*Cătălin-Ionuț CIOBANU*¹
*Alexandru-Mihai BUGHEANU*²
*Rareș Constantin CIOBANU*³

ABSTRACT

The quality of life (QOL) is a generic notion discussed all over the world nowadays. The present study aims to analyze a specific characteristic of the QOL in urban areas -the public transportation system, which has a direct influence on the relationship between people satisfaction and sustainable quality of life. The purpose of this article is to offer a short review of the literature and to evaluate the existent situation, in order to outline an overview of the way in that the public transportation system in Bucharest influences on different aspects the general quality of urban life.

KEYWORDS: *Bucharest, public transport, life quality, urban areas.*

JEL CLASSIFICATION: **R40**

1. INTRODUCTION

The present paper examines the public transportation system in Bucharest in direct correlation with the quality of life, mainly on account of the fact that the degree of motorized vehicle in the city registered an unprecedented growth last year. Therefore, is noticeable a deterioration of the environmental quality.

Urban environmental factors have a direct impact on quality of life, influencing the behavior and attitudes of individuals in both positive and negative ways. Regarding quality of life, it is influenced by a variety of issues such as: environmental characteristics; waste management; the phonic pollution; the air pollution; waste water management; etc.

Whether we are discussing about the cities, we need to include in the discussion issues such as population growth effects, urban sprawl, environmental degradation, undesired growth of social models. These aspects have drawn concern amongst the researchers in urban planning and management. The cities importance lies in satisfying the need for quality of urban life improvement.

The transport infrastructure has a significant role in urban development because it provides the necessary mobility demand and accessibility to the main parts of the city.

¹ Bucharest University of Economic Studies, Bucharest, Romania, ciobanucatalinonut@yahoo.com

² Bucharest University of Economic Studies, Bucharest, Romania, alex.m.bugheanu@gmail.com

³ Bucharest University of Economic Studies", Bucharest, Romania, raresciobanu95@yahoo.com

Objectively, Bucharest ranks as a poorly developed city in terms of quality of life and public transportation.

The main shortcomings encountered in Romania`s capital from this point of view are: the stagnation of the values associated with the standard of living and quality of life; the existence of undersized transport routes; degraded infrastructure; insufficient parking spaces; degradation and progressive reduction of green areas; intense traffic and congestion.

These issues have significant negative consequences on human health, citizens` quality of life or economic performance of the city.

Therefore we consider justified the need to study more closely the quality of life in this city in terms of public transport.

2. LITERATURE REVIEW

The transport activity is essential for the economic and social development of any society.

As an illustration, in the opinion of (Marans, 2012)"the quality of our lives has many dimensions including our families, our jobs, our financial situation and as we age, our health[...]As such, a fundamental assumption underlying many approaches to planning and design is that places may be designed to enhance the quality of people`s lives".

The quality of life represents an important theme in many areas. All the studies conducted reflected mainly the situation of developing cities or countries(Shek & Lee, 2007). The attraction point of those studies is represented by the urban reality, since it attracts a series of malfunctions and problems, especially in the light of deteriorating the urban environment and decreasing the quality of life, aspects that require reorganization and evaluation.

Thanks to the fact that the cities were often impacted by the disequilibrium phenomenon, resulted through industrialization or urbanization, the cities are most often area of many different conflicts (Martins & Santos, 2007).

Mobility issues are increasingly important in today`s fast-growing urban centres all over the world, but particularly in the European Union, where 75% of inhabitants live in urban areas.

Several theoretical aspects will be further presented, through the literature review.

Seven major areas have a particular influence and contributes to realize the urban quality of life:

- Environmental urban quality of life;
- Physical urban quality of life;
- Mobility urban quality of life;
- Social urban quality of life;
- Psychological urban quality of life;
- Economical urban quality of life;
- Political urban quality of life (Shalaby et al., 2013).

The quality of life is a complex notion, with multiple dimensions, representing more than the economic production or living standards. It includes a series of items that may influence people perception regarding their life, beyond the material issues.

According to (Eurostat Statistical books, 2015)the main factors that may determine the quality of life are: the natural environment and living conditions; governance and fundamental rights; economic and physical security; social relations and recreation; material living conditions; productive or major activity; health; education. The eight dimensions of quality of life are quantified by personal perception in relation to how each persons manner of defining wellbeing.

The World Health Organization (WHO) defines quality of life as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad-ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment (WHO Quality of Life Group, 1993).

Quality of life is one of the major dimensions for a sustainable urban development. (Shalaby et al., 2013) explored the relationship between QOL and urban development: "since sustainability implies a balance between environmental, social and economic qualities, policies that seriously decrease an individual's quality of life can hardly be called sustainable". The findings indicate that it is important to know the particular elements of sustainable development and the particular percentages that influence the quality of life for the residents.

In the opinion of the (American Public Transportation Association, 2008) the benefits of public transport are:

- Enhances personal opportunities by providing personal mobility and freedom for people from every walk of life, and by providing access to job opportunities, schools, social networks, shopping and health facilities;
- Saves money by providing an affordable, and for many, a necessary alternative to driving;
- Fosters more liveable communities;
- Provides economic opportunities;
- Offers mobility for seniors and the disabled.

(Friman & Fellesson, 2008) realized a study of perceived satisfaction with public transport in nine European cities. Using factor analysis, four satisfaction dimensions were identified: system, comfort, staff and safety.

In 2011, the European Commission adopted a Roadmap for a Single European Transport Area that sets out 40 concrete initiatives for the next decade, with the aim of building a competitive transport system to increase mobility, remove major transport barriers in key areas, and fuel growth and employment. At the same time, the proposals will dramatically reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050 and halving the use of conventionally fuelled cars in urban transport by 2030. Competitive and clean public transport is an essential part of this roadmap (European Commission, 2011).

3. THE SITUATION OF PUBLIC TRANSPORTATION IN BUCHAREST

The present research aims to analyze the influences of the public transport system from Bucharest on the quality of urban life for individuals. The paper will address both the positive and negative aspects in this field of research.

The transport infrastructure in Bucharest should be carefully examined since it provides continuous access to all parts of the city for more than 2 million people daily (Baltă, 2003). The researcher investigated the urban transport and quality of environment factors in Bucharest area.

In Bucharest, the quality of living is affected by a high density, leading to the decline in living conditions and consequently poor quality of life. The most common negative aspects caused by the high number of citizens are: traffic congestion which affects the mobility of people, the chaotic urban development construction process, the multitude of administrative problems. All of these problems occurred as a result of urbanization, which affects the lives of every inhabitant of the capital (Paltenea, 2013).

Regarding the quality of life, Bucharest registered a positive evolution, in the last ten years. Although, at european level, the capital is not yet up to expectations, ranked as 68 of 79 in a comparative study conducted by the General Directorate for Regional and Urban Policy within the European Commission(European Commission, 2011).

In another QOL survey, also conducted by the European Commission for 28 EU capitals, Bucharest is positioned in the 15th place, after cities like Warsaw or Ljubljana, but, surprisingly, it is above Brussels, Berlin and Dublin.

Tabel 1. Quality of life – capital cities ranking

Ranking (country, capital, final score)	Ranking (country, capital, final score)
1. Luxembourg – Luxembourg (5,80)	15. Romania – Bucharest (4,64)
2. Austria – Vienna (5,22)	16. Ireland – Dublin (4,56)
3. Latvia – Riga (5,10)	17. Malta – Valletta (4,56)
4. Czech Republic – Prague (5,06)	18. Croatia – Zagreb (4,52)
5. Bulgaria – Sofia (5,06)	19. Belgium – Bruxelles (4,52)
6. United Kingdom – London (5,02)	20. Cyprus – Nicosia (4,30)
7. Denmark – Copenhagen (5,00)	21. Estonia – Tallinn (4,28)
8. Finland – Helsinki (4,98)	22. Lithuania – Vilnius (4,26)
9. Hungary – Budapest (4,94)	23. Slovakia – Bratislava (3,98)
10. Netherlands – Amsterdam (4,88)	24. Germany – Berlin (3,94)
11. Poland – Warsaw (4,86)	25. Portugal – Lisbone (3,88)
12. Slovenia – Ljubjana (4,84)	26. Greece – Athens (3,86)
13. Sweden – Stockholm (4,78)	27. Spain – Madrid (3,64)
14. France – Paris (4,68)	28. Italy – Rome (2,62)

Source: adapted from the European Commission

This ranking takes into account five criteria: the price of housing, public transport, the opportunity to find a job, the efficiency of administrative services and level of foreigners` integration in the capital.

Tabel 2. Ranking based on the above mentioned criteria

Romania	Bucharest 1.718.888 inhabitants
The price of housing	4.9
Public transportation	4.9
Opportunity to find a job	4.1
Efficiency of administrative services	3.5
Level of foreigners integration	5.8
Final score	4.64

Source: adapted from the European Commission

Tabel 3. Index Public Transportation

Country (Capital)	Final score
Poland	8
Slovakia	5.1
Slovenia	7.8
Denmark	7.7
Germany	7.7
Estonia	5.9
Sweden	8
Finland	8.9
Latvia	8.1
Lithuania	4.8
Romania	4.9
Belgium	6.7
Netherlands	8
Italy	3.3
Greece	6.7
France	7.8
Spain	3.2

Source: adapted from the European Commission

Mobility means the ability of people to move from one place to another. Not all people have the same mobility degree as access to various means of moving. Therefore it appears as necessary the planning and public action to ensure equal opportunities for all city residents to be able to move from one place to another.

When it comes to cities, mobility is rather means to ensure the access to destinations, activities, goods, services and jobs. On a dynamic map like this, a resident will be at some point in transit to get to work, school or a meeting with friends. The accessibility depends also on a number of factors such as duration and cost of travel or comfort level. More and more, in the urban planning, not just the speed but the efficiency of travel is important but also the proximity. A dense or compact planning limits the need for long journeys.

According to a Project financed by the EEA Grants 2009-2014 realised in Bucharest, the essential services that need to be improved according to the respondents are the following:

- Bicycle lanes (22% of respondents);
- Favorite routes for pedestrians (19% of respondents);
- Parking problems (19% of respondents);
- Dedicated lanes for buses (14% of respondents).

In a smaller proportion were chosen new subway lines (10%), new bus lines (9%) and wide roads (7%).

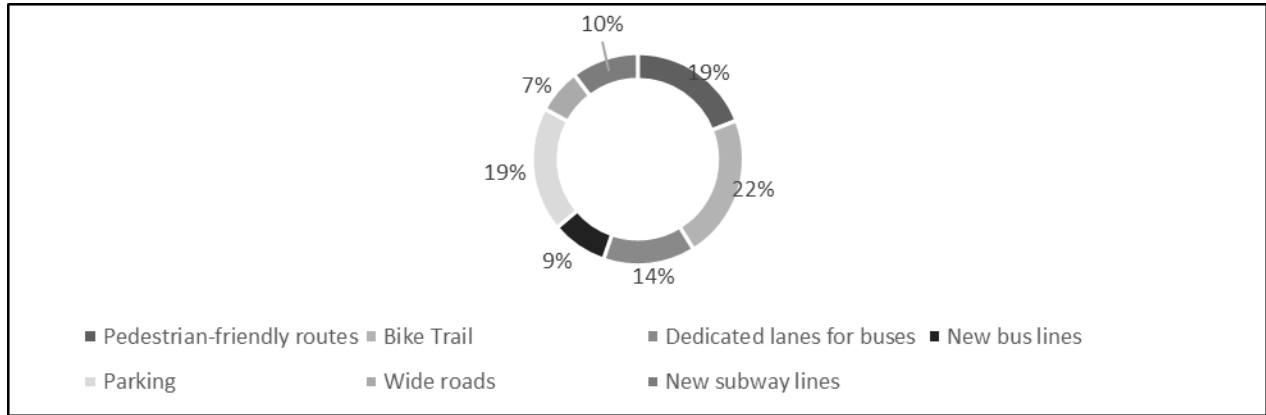


Figure 1: Services to improve at neighborhood level

Source: Data analysis using SPSS

For daily moving to work, school, college, the most used means of transport are the subway (28% of respondents), while 19% prefer the walking. 18% of respondents use buses or trolley for transportation and 16% car.

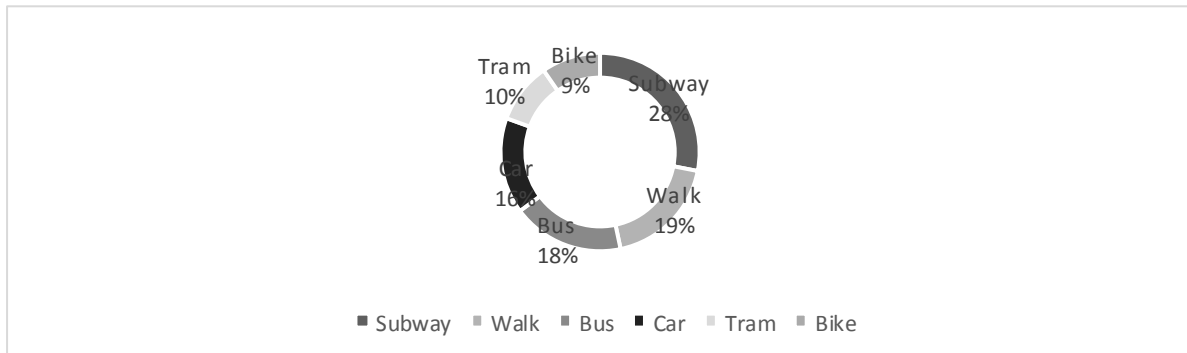


Figure 2: The most used means of transport

Source: Data analysis using SPSS

It can be seen that most of the respondents spend between 20 and 40 minutes a day in traffic, and with those who spend between 40 minutes and one hour up are over 50% of respondents.

Furthermore, the authors studied and determined the extent to which respondents agree that sidewalks can be reduced in width and transformed into parking lots or lanes when traffic is congested. About 60% of respondents disagree with this measure, only 25.3% deem suitable, only 7.9% chose the answer variant *do not know*.

In order to analyze the current context for Bucharest, the local authorities researched information about the living conditions regarding different cities in the world. Thus, using the international online database *Numbeo* were studied the real state information, data about the health care conditions, urban transportation, crime or pollution. Furthermore, it was realized a ranking based on various criteria for the top world cities (Primăria Municipiului București, 2015).

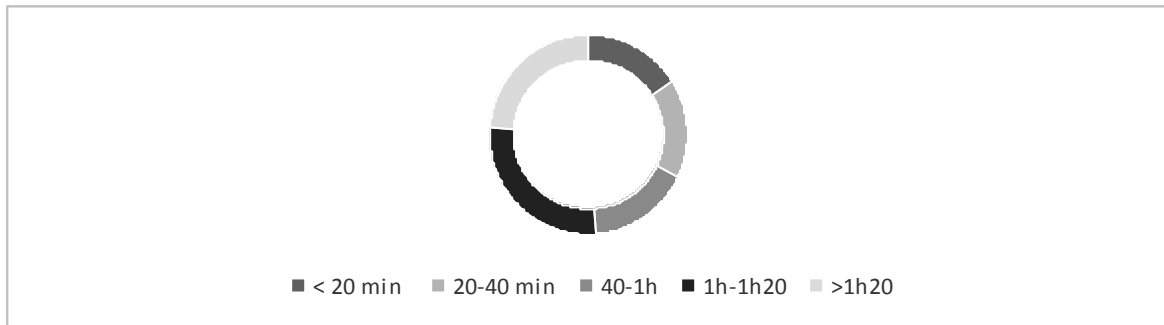


Figure 3: Time spent in traffic
 Source: Data analysis using SPSS

It is considered that cities with an integrated multi-modal transport system presents the greatest opportunity for growth and prosperity. Another interesting aspect, meant to justify the impact of transport on the quality of life consists in the fact that the cities ranked among the top positions in quality of life studies in urban areas present a high quality transportation system, with priority to public transport and non-motorized modes of transportation.

Are prezentativ factthat needs to be studied is the *index of traffic* in Bucharest. It consists of:

- Traffic index (consists of time spent on route to work, consumption of CO₂, the discomfort created by the time used to stay in traffic and other traffic);
- Time index (the average time required to transport, in minutes);
- Exponentially time index (an estimate of the stress resulting by big time spent in traffic). It is assumed that the stress grows exponentially with each minute exceeding 25 minutes spent in traffic;
- Inefficiency index (estimated time for traffic failures);
- CO₂ emissions index (CO₂ emissions estimation in traffic)(Primăria Municipiului Bucureș ti, 2015).

➤ **Negative aspects of public transport system in Bucharest**

According to official data provided by the Romanian surface transport society(Regia Autonomă de Transport Bucureș ti, 2015), by the end of 2014, the vehicles fleet used for the surface network transportation recorded an average vehicles mechanical wear and tear of:

- 85,82% mechanical wear for trams;
- 96,67% mechanical wear for trolleys;
- 93,00% mechanical wear for buses.

It should also be noted that during the entire year 2014 were not purchased any new transport vehicles.

Another significant negative aspect for public transport users in Bucharest is increasing the number of towed vehicles by 15.30% in 2014 compared to 2013 (3,208 vehicles in 2014, compared with 2,784 in 2013). Accordingly, the transport modes that have experienced technical failure were not able to continue the normal schedule, thus decreasing the satisfaction of users.

A significant effect of the development of public transport using motorized vehicles is deteriorating the global environment, which has direct negative influence on the quality of life.

High CO₂ emissions and other greenhouse gases (CO, NO_x, various volatile organic compounds-VOC) are produced by road traffic, both public and private thus affecting on long-term the environmental quality.

To illustrate these issues is relevant Table 1, where are presented the percentage of greenhouse gas emissions, both on European level and also particularly for Romania, in various sectors of activity.

Table 4.Greenhouse gas emissions according to sector of activity

Activity sector	Ranking European Union	Greenhouse gas type (%)		The type of influence on quality of life
		CO ₂ European Union	CO ₂ Romania	
Production of electricity and thermal energy	1	40.2%	48%	Indirect
Construction and manufacturing industry	3	16.9%	22%	Indirect
Transport	2	19.2%	13%	Direct
Agriculture and commercial sectors	6	6%	3%	Indirect
Residential sector	4	12.1%	6%	Direct
Other industries	5	4.2%	8%	Direct

Source: adapted from (Programul Operațional Regional Centru, 2010)

Analyzing the share of emissions from greenhouse gases according to the sectors of activity, it was found that regionally the highest level is due to emissions resulting from the use of residential combustion installations 45.570%, followed by the industrial sector 34,704% and transport sector with 12.735%.

➤ **Positive aspects of the public transport system in Bucharest**

Official public information from (Regia Autonomă de Transport București, 2014) reveals that to date 31.12.2014, modernization of the urban transport situation was as follows:

- 61.5% of the road network is upgraded;
- 46% of the total number of depots have been upgraded;
- 13% of the power grid for electric trolleybuses was rehabilitated.

Basically, through the use of new technical solutions the comfort for passengers is much improved.

Improving living conditions for individuals, and thus raising the quality of life should be a permanent objective for any public authority. In the opinion of the researcher (Marans, 2012) in the research about the quality of urban life (*QOL*), the urban characteristics and the perceived satisfaction of individuals should be explored taking in consideration some aspects like "the amount of public open space and the number of recreational facilities, museums and art galleries, sports teams, health services and facilities, and public transport characteristics".

Therefore, in most urban areas with a numerous population, the public transport system is one of the parameters that requires a careful and detailed analysis.

The transport network can represent itself an essential feature of urban areas, for example-the large cities in the Netherlands, where approximately 53% of all the trips are made by bike. Specifically, we should state that Amsterdam has the longest length for cycle lanes in the world: over 400 kilometers.

For this reason it is obvious that the transport system contributes in a high proportion when we are analyzing the level of satisfaction for individuals, thus increasing or decreasing the quality of urban life experience.

4. CONCLUSIONS

Finally quality of life is a widely used concept, increasingly in the urban development process. One of the reason is the fact that people place value on variables such as access to means of travel.

It was noted that the supply of mobility services is continuously increasing mobility as well as people's demand for complete, more reliable, real-time travel information and easy to use travel information.

To conclude, the strategy for the public transport system should be analyzed in the entire context of the urban strategy for Bucharest, mainly because the proper functioning of the transport network depends on the investments in the general urban infrastructure. Also, it is necessary to correlate the strategic orientation of EU in the quality of life domain, by ensuring a satisfactory transport system, adapted to existing needs.

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REFERENCES

- Agenția Națională pentru Protecția Mediului, (2007). *Raport anual privind starea mediului în România pe anul 2007*. București: Ministerul Mediului, Apelor și Pădurilor.
- American Public Transportation Association, (2008). *Public transportation fact book. 59th edition*. Washington, DC: APTA.
- Baltă, C. E. (2003). Transportul urban și calitatea factorilor de mediu în spațiul Bucureștean. *Analele Universității "Valahia" Târgoviște*, 350-53.
- Baltă, C. E. (2003). Transportul urban și calitatea factorilor de mediu în spațiul Bucureștean. *Analele Universității "Valahia" Târgoviște. Seria Geografie*, 347-53.
- Bucharest Airports National Company, (2015). *Bucharest Airports*. Retrieved September 1, 2015 from: <http://www.bucharestairports.ro/cnab/en/>
- Din, H. S. E., Shalaby, A., Farouh, H. E. & Elariane, S. A. (2013). Principles of urban quality of life for a neighborhood. *HBRC Journal*, 86-92.

- European Commission, (2011). *Roadmap to a single European transport area – Towards a competitive and resource efficient transport system*. Luxembourg: Publications Office of the European Union.
- Eurostat Statistical books, (2015). 978-92-79-43616-1 *Quality of life. Facts and views*.
- Eusuf, M. A., Mohit, M. A., Eusuf, M. S. & Ibrahim, M. (2014). Impact of Outdoor Environment to the Quality of Life. *Procedia - Social and Behavioral Sciences*, 153, 639-43.
- Friman, M. & Fellesson, M. (2008). Perceived satisfaction with public transport services in nine European cities. *Journal of the Transportation Research Forum*, 47(3), 93-103.
- Groot, J. d. & Steg, L. (2006). Impact of transport pricing on quality of life, acceptability and intentions to reduce car use: An. *Journal of Transport Geography*, 14, 463–70.
- Irina, R. C. & Maria, V. (2012). The evolution of Romanian tourism in terms of economic instability. *Annals of the "Constantin Brancuși" University of Târgu Jiu, Economy Series*, 136-40.
- Mammadov, R. (2012). The Importance of Transportation in Tourism Sector. *7th Silk Road International Conference "Challenges and Opportunities of Sustainable Economic Development in Eurasian Countries"*.
- Marans, R.W. (2012). Quality of Urban Life Studies: An Overview and Implications for Environment-Behaviour Research. *Procedia. Social and Behavioral Sciences*, 9-22.
- Martins, I. & Santos, L. D. (2007). Monitoring Urban Quality of Life: The Porto Experience. *Social Indicators Research*, 411-25.
- Mazilu, M. (2010). A New Strategy for Relaunching Tourism in Europe. *Annals of the University of Petroșani, Economics*, 10(1), 177-82.
- Paltenea, L. (2013). *Calitatea vieții în spațiul urban contemporan din România. Studiu de caz – Locuirea colectivă în București*. Retrieved September 16, 2015 from: <http://www.bucurestiivechisinoi.ro/2013/06/calitatea-vietii-in-spatiul-urban-contemporan-din-romania-studiu-de-caz-locuirea-colectiva-in-bucuresti/>
- Pintilii, R.-D., Peptenatu, D., Draghici, C. & Schvab, A. (2010). Weekend tourism as an instrument of local development. *GeoJournal of Tourism and Geosites*, 5(1), 44-51.
- Popescu, R. I. (2009). The branding potential of Bucharest. Strategy and succes factors. *Theoretical and Empirical Researches in Urban Management*, 4(13).
- Primăria Municipiului București (2015). *Raportul Anual de Activitate 2014*. București.
- Programul Operațional Regional Centru, 2010. *Analiza emisiilor de gaze cu efect de seră la nivelul regiunii centru în contextul schimbărilor climatice*. Ministerul Dezvoltării Regionale și Turismului.
- Regia Autonomă de Transport București (2014). *Raport de activitate al RATB pentru anul 2014*. Bucharest: R.A.T.B - Regie Autonomă.
- Regia Autonomă de Transport București (2015). *Bucharest City Tour*. Retrieved August 25, 2015 from: <http://bucharestcitytour.ratb.ro/index.html>
- Regia Autonomă de Transport București (2015). *Raport de activitate al Regiei Autonome de Transport București pentru anul 2014*. București.
- Romanian National Institute of Statistics, 2014. *Romanian Statistical Yearbook 2012*. Bucuresti: INS Romania.
- SC METROREX S.A. (2012). *Metrorex Activity Report*. Bucharest.
- SC R.A.T.B. RA (2013). *R.A.T.B. Bucharest Activity Report*. Bucharest.
- Shalaby, A., Farouh, H. E., Elariane, S. A. & Din, H. S. E. (2013). Principles of urban quality of life for a neighborhood. *Housing and Building National Research Center*, 9, 87-90.

- Shek, D. T. L. & Lee, B. M. (2007). *A Comprehensive Review of Quality of Life (QOL) Research in Hong Kong*. The Scientific World Journal.
- Simion, D., Mazilu, M., Pătruțescu, M. & Ispas, R. (2010). The Economic and Social Contribution of Tourism from the Sustainable Development Point of View. *Proceedings of the 5th WSEAS International Conference on Economy and Management Transformation*, Volume I.
- The Government of Romania, (2009). *Decision no. 1208/2009 on the establishment of the Bucharest Airports National Company*. Bucharest: The Government of Romania.
- Wall Street Magazine, (2015). *Wall Street*. Retrieved September 2, 2015 from: <http://www.wall-street.ro/articol/Auto/178663/cat-te-costa-sa-devii-taximetrist-bucuresti.html>
- WHO Quality of Life Group, (1993). *Study protocol for the World Health Organization project to develop a quality of life assessment instrument (WHOQOL)*. *Quality of Life Research*, 153-59.