The Social Dimension of Sustainable Transport: Investigating the Accessibility of Batna's Residents to Public Transport Systems

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Abstract:

The aim of the current research is to analyze Batna's public transport system in order to identify the main characteristics of social inclusion/exclusion. This diagnostic will allow us to have a full image of the reality of individual's opportunities to access key services (work, education, healthcare, shopping, etc.) in order to explore the possibility of implementing the best practices of sustainable mobility; both at the level of individuals and at the level of the state (policies).

Results of the study have revealed that there is a social exclusion in Batna's public transport systems, especially regarding security & safety indicators.

Keywords-component: Sustainable transport, accessibility, social exclusion, equity, Batna, Algeria.

ملخص:

الهدف من هذه الورقة البحثية هو تحليل نظام النقل الجماعي في ولاية باتنة من أجل تحديد أهم خصائص التهميش أو الاندماج الاجتماعي. هذا التشخيص سيسمح لنا بالحصول على صورة شاملة عن واقع فرص الأفراد للالتحاق بالخدمات الرئيسية (العمل، الدراسة، الخدمات الصحية، التسوق،...) من أجل بحث إمكانية تطبيق أفضل لممارسات التنمية المستدامة؛ سواء على مستوى الأفراد أو على مستوى

الدولة ككل (السياسات). الغاية النهائية من هذا البحث هي تطوير نظام نقل ملائم وتعزيز الحركية في إطار عدالة أحسن.

أظهرت نتائج الدراسة وجود تهميش اجتماعي في أنظمة النقل الجماعي بباتنة، خاصة فيما يتعلق بمؤشرات الأمن والسلامة.

كلمات مفتاحية: النقل المستدام، التهميش الاجتماعي، العدالة، باتنة، الجزائر.

1. INTRODUCTION:

The development pace of today's communities has led to an expansion of the living range, which caused a considerable urban sprawl leading to an explosion in urban centers; small cities became very large in just few years.

Algeria has been facing a huge urban sprawl in the last two decades, especially in the periurban areas; it can be explained by the rural exodus in the 90s and the relatively low prices of lands on suburb areas. Affording acceptable transport services to these new neighborhoods created a big challenge to the Algerian government especially after the liberalization of the transport market to privates and, this made it worse, the rapid increase of the Algerian's purchase power in the last decade which led to a considerable evolution in the national park fleet (1 car for 5 inhabitants in 2012 compared to 1 car for 10 inhabitants in 1996)[1]. The same condition has been observed in various countries, regarding France[2], United Kingdom[3,] regarding a

[1]- H. MOUFFOUK & F. BOUBAKOUR. **Equity and the struggle against social exclusion in urban transport: on certain aspects in the city of Batna (Algeria).** El Tawassol journal. Article in press.

[2]- D. Caubel, « **Transport policy and access to the city for all? An evaluation method applied to the Lyon area** ». Politique de transports et accées à la ville pour tous? Une méthode d'évaluation appliquée à l'agglomération lyonnaise. Economies and finances. Université Lumière - Lyon II, 2006. French. <tel-00080103v1> ;

National School of Administration (ENA), «Which local travel management to meet the mobility needs ? » Quelle gestion locale des déplacements pour répondre aux besoins de mobilité? » «Options d'approfondissement» Groupe n° 20. 2009. C. Féré, 2011. « Reconciling access to mobility for all and sustainable mobility Consideration of unequal access to mobility in urban policies of Lyon» Concilier accès

worldwide perspective; for the G7 countries[4], regarding the developing countries[5].

The current study presents the results a pilot survey regarding the role of public passenger transport in causing social exclusion/inclusion conditions. The survey intended to investigate public transport related social exclusion problems and the possibility to adapt the international experiences in dealing with this subject to fit into our local characteristics.

The questionnaire was designed to cover five main aspects that have a direct connection with social exclusion in public transport:

- The spatial coverage of public transport network;
- The temporal dimension of accessibility, especially the availability of transport's means after work (late hours);
- The ability of individuals, especially those with low income, to pay transport fares;
- Security inside means of transport and inside bus stations;
- The integration of specific categories (this part will be according to the approach of Amartya Sen).

The basic hypothesis of this paper is that "there is social exclusion in public transport in the wilaya of Batna."

à la mobilité pour tous et mobilité durable La prise en compte des inégalités d'accès à la mobilité dans les politiques urbaines de l'agglomération lyonnaise. Thèse de doctorat. Université Lumière Lyon 2.

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2. A BRIEF LITERATURE REVIEW ON THE SOCIAL DIMENSION OF SUSTAINABLE TRANSPORT:

In 1992, the European Union published a White Paper[6] talking for the first time about sustainable mobility. The European Union made sustainable mobility as a goal to be achieved for all the member countries; following the second article of The Maastricht Treaty, European Commission has adopted sustainable mobility as an extension for this treaty[7]. This report talked about the evolution of the use of private cars comparing to the decline of the use of all other modes (an exception has to be given for the aviation sector because it has witnessed a growth of 400%).

In 1996 The World Bank[8] published a report talking, explicitly, for the first time, about the term of Sustainable transport. It gave a clear definition to this term based on three dimensions (economic and financial, environmental and ecological, social and distributional).

Having said that, the social dimension of sustainable transport is not a new theme in the literature; the first who dealt with this subject were the French in the 60s of the last century[9] but the links between transport and social exclusion were first made in the early 1970s[10]. Washes and Kumagai[11] identified physical mobility as a major contributor to social and economic

[6]- EU Commission. **The Future Development of the Common Transport Policy: A Global Approach to the Construction of a Community Framework for Sustainable Mobility** - White Paper. COM (92) 494 final, 2 December 1992. Bulletin of the European Communities, Supplement 3/93. [EU Commission - COM Document] Link : http://aei.pitt.edu/1116/

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[11]- Washes and Kumagai (1973), quoted in: K. Lucas, ibidem, 2012.

inequality. Preston *et al* confirm that mobility and accessibility are used to investigate how social exclusion is affected by transport[12].

There were many attempts to link social exclusion with transport. Researchers were using different methods to investigate inequity in mobility and just after the 1990s, a new interest of the social issues of accessing mobility has been set[13]; a well-known report made by Social Exclusion Unit[14] can be mentioned where it made the connection between transport and almost all the economic and social activities.

A limited mobility affects, negatively, the accessibility to daily activities (to work, to house, to studying, to leisure and to health)[15]. Urry has stated that governments must enhance mobility to reduce the social exclusion and that we have to "move to get out of it." [16] Markovich & Lucas stated that "mobility and accessibility are important indicators that can help in the development of an insight into social inclusion and transport." [17] Access to Private cars and/or accepted public transport services (affordable prices, spatial and temporal coverage and integrating specific categories) constitutes a fight against poverty[18]; individuals with limited incomes will have the opportunity to look for jobs in an easier way or to send their children to schools without bearing high costs. An equitable accessibility in poor neighborhoods forms an open neighborhood environment that has an important role in integrating young people, especially unemployed.

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[13]- C. Féré. op.cit., 2011
[14]- Social Exclusion Unit, Idem, 2003.
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[18]- C. Féré, idem, 2011; R. Levita, C. Pantazis, E. Fahmy, E. Lloyd, & D. Patsios, **The multidimensional analysis of social exclusion** . Bristol: Townsend Center for the International Study of Poverty and Bristol Institute for Public Affairs, University of Bristol. 2007

3. CASE STUDY:

3.1- Defining the sample study:

Our sample consists of 201 individuals where 77.6% of them are males and 22.4% females; from the first analysis it seems that the distribution of our sample wasn't equitable regarding the gender, but as we've mentioned above, we've tried to adopt international experiences to our local characteristics; men tend to travel far to look for jobs and/or study unlike women who tend to find a work and/or study in places close to their place of residence.

The biggest proportion of our sample is between 18 and 40 years old (192), (6) under 18 years old and (3) more than 40 years old. The majority of them (164) have university level of education while (37) have high school or less.

More than half of the sample represents students (92 university students and 12 students of high school), (49) employee, (40) self-employment and (8) jobless.

Our sample was consisted of more than a half (53.7%) with an income less than 15000 DZD (about 120 Euros). 17.4% between 15000 and 25000 DZD (120€ and 200€), 10.9% between 25000 and 35000 DZD (200€ and 280€), 10.9% between 35000 and 45000 DZD (280€ and 360€) and 10.4% more than 45000 DZD (360€).

3.2- Analysis of the survey:

We will illustrate our results according to the main five groups of categorization that have been explained in the introduction.

3.2.1- The spatial coverage of public transport network:

The physical coverage of public transport network (see fig. 01) seems to be good, but in reality, actors do not respect the lines assigned to them by transport department. This state can be explained as follows:

- First of all, the final part of the lines (like in the case of *Kechida*) presents a terminal that does not generate trips so transporters tend to avoid going to the end of the line;

- Secondly, the roads in these areas are very deteriorated, hence the bus drivers tend to avoid them.

In our study, 84.1% of interviewees reported that they are covered physically by public transport's network, against 15.9% who reported a lack of physical coverage. Regarding the spent time in means of transport, those who reported "not being covered by public transport systems" spend 76 minutes in average inside transport means compared to 66 minutes for those who reported "being covered by transport means."

73.1% reported that their site of living is close to a bus station while 26.9% reported not. Regarding this last category, 51% of them have to walk more than 10 minutes to reach the closest bus station.

3.2.2- The temporal dimension of accessibility:

Investigating the needed time to access public transport means and its availability in the early mornings and the late evenings, especially rush hours, consist a crucial element regarding excluding/including individuals in the society. 88.6% of our sample agreed of the availability of public transport means in the mornings against 11.4% who said no. 64.2% reported having no problem in finding public transport means in the evening while 35.8% do have issues in finding public transport means. Only 22.9% agreed that the frequency of public transport systems is good while 77.1% consider it bad.

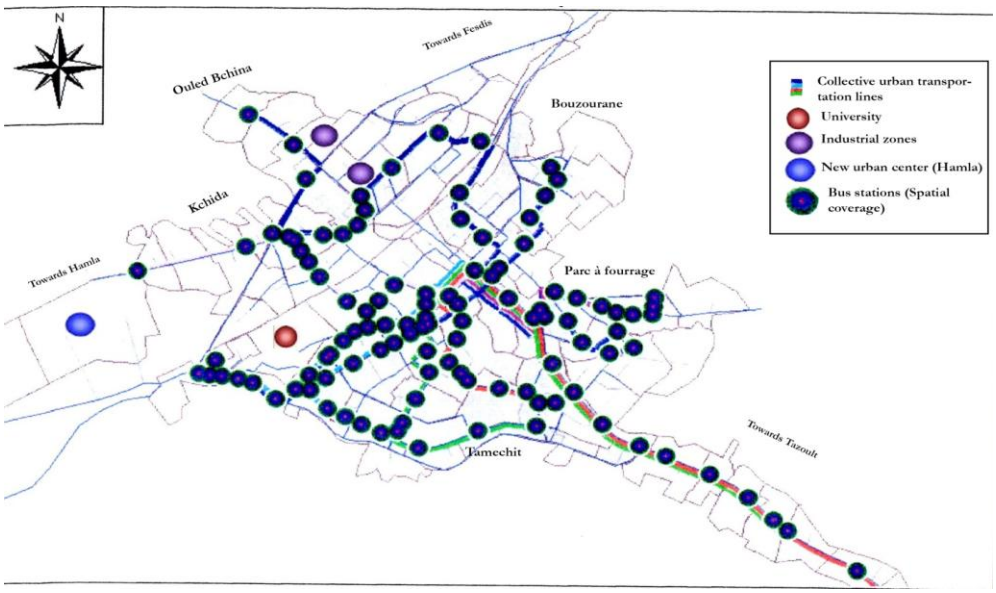
Investigating the accessibility time to the closest public transport station has shown that 42.3% of our sample has an accessibility time of less than 5 minutes, 31.3% from 5 to 10 minutes, 17.4% from 10 to 20 minutes and only 9% have an accessibility time for more than 20 minutes.

Another question has been asked to investigate whether individuals are forced to take taxi in the late evenings because of the luck of public transport means; 44.8% reported that they sometimes take a taxi at the end of work, 30.8% reported rarely and 24.4% reported that they often do take a taxi at the end of work.

It has to be noted that regarding those who reported finding problems in finding public transport means at evenings, 39% of them reported "often" taking taxi and 45.8% reported "sometimes" against just 15% who reported "rarely". 55% of those having an accessibility time to the closest public transport station "between 10 and 20 minutes", reported that they "often" take a taxi at the end of the work.

It was found as well that females spend more time in public transport means than males, 77 minutes in average compared to 64 minutes per day.

Fig. 01: **The spatial coverage of Batna's transport systems.**



Source: (Ministry of Transportation. 2009)

3.2.3- The ability of individuals, especially those with low income, to pay transport fares:

The Algerian government regulates prices of public transport services (for both buses and collective taxis). 78.6% of our sample believes that fares of buses are "acceptable" while 17.9% see them "high" and only 3.5% consider them "low."

Regarding taxis, only 16.4% consider their prices "acceptable" while 83.6% consider them "high". It has to be noted that none of the interviewees have reported taxi fares to be "low."

By analyzing the answers of our low-income interviewees (the category that have an income less than 15000 DZD) it was found that from those who reported "bus fares are high", 61% of them belong to this category and 86% of them reported that taxi fares are "high."

Regardless the availability of university buses (buses dedicated for transporting university students), 25% of university students find bus fares "high", and 83% of them find fares of taxis "high." This can be explained because 85% of students reported having an income less than 15000 DZD/month.

The results of a previous study on the same city have shown that individuals spend almost 20% of their income on transport (for those having an income less than 10000 DZD/month, they reported spending between 1200 DZD and 1800 DZD of their income monthly)[19].

3.2.4- Security inside means of transport and inside bus stations:

In this section, questions related to the security levels inside buses and bus stations have been asked. Questions related to the quality of driving of buses have been asked as well. It was found that 60.7% find the security level inside buses "low", 36.8% find it "acceptable" and only 2.5% find it "good." Talking about bus stations 72.1% find it "low", 26.4% find it "acceptable" and only 1.5% find it "good."

If we consider gender in our analysis, we find that 49% of females find security levels in buses "low" compared to 61% of males who find it "low." Regarding security levels in bus stations 66.7% of females find it "low" compared to 73.7% of males who find it "low." The results of this analysis

[19]- F. Boubakour H. Mouffouk, & L.R. Mazouz, "**Equity and the fight against exclusion in urban transport: On some aspects in the city of Batna, Algeria**." 13 international conference of MEEA on managing the MENA transitional economies. Tlemcen. 31st May – 1st June 2014.

was a surprise since we thought that females would report a sense of non-security more than males.

Regarding the quality of buses' driving, we have noticed that bus drivers seem to be in a competition where they race to collect the maximum possible of clients. Our survey has confirmed our hypotheses where 55.2% of our interviewees found it risky driving, 41.3% found it acceptable and only 3.5% found it good driving.

3.2.5- The integration of specific categories:

This part of the analysis has been developed according to Amartya Sen's approach of justice. His approach can be explained using his example of the use of bicycle. A good explanation has been provided as follows: "*Sen illustrates his point with the example of a standard bicycle. This has the characteristics of 'transportation' but whether it will actually provide transportation will depend on the characteristics of those who try to use it. It might be considered a generally useful tool for most people to extend their mobility, but it obviously will not do that for a person without legs. Even if that person, by some quirk, finds the bicycle delightful, we should nevertheless be able to note within our evaluative system that she still lacks transportation*"[20].

A semi-structured questionnaire has been addressed to eight handicaps (4 males and 4 females, 5 of them unemployed and having a high school or less level of education). Questions related to how they move inside the town using public transport means have been asked. The interview was designed to cover main movements (home work/study) and the secondary movements (shopping, visiting relatives, healthcare, leisure…). By analyzing the quality of service provided to this category and the hardships they are facing in their daily movements we can act to provide a better quality of service.

[20]- T. Wells, **Sen's Capibility Approach**. Erasmus University Rotterdam. Available on : http://www.iep.utm.edu/sen-cap/ 30/04/2015

Most of the interviewees reported taking the bus in their daily movements while they depend on their families in their secondary movements (especially when visiting relatives).

All the interviewees reported a lack of equipment in buses (with a more negative score to the buses of private actors compared to public actor).

The stairs are too high and no bus in the city of Batna is equipped with automatic elevator to facilitate the access of wheelchairs.

Bus stations are not configured properly to facilitate their accessibility; bus drivers do not pull over close to the sidewalks that make it hard for the handicaps to access buses. Furthermore, the state of sidewalks generates more hardships to this category; all interviewees reported having problems with sidewalks mainly because of their height.

Another problem has been noticed regarding the lack of information signs inside buses and bus stations to map the routes of buses. Most of the interviewees reported that buses are not equipped to facilitate the accessibility of these categories.

In another dimension, the 201 interviewees have been asked a question regarding the extent of integration of specific categories, their answers were as follows:

94.5% reported that the buses are not equipped to facilitate the accessibility of these categories, while only 5.5% reported contrary.

4. RESULTS:

The analysis of the questionnaire has come up with the following results:

- Spatial coverage of transport network is, generally good; the majority of the sample agreed on this fact. Though a further analysis should be addressed to those who reported not being covered;
- The time spent in means of transport for those who reported not being covered by transport network is bigger than those who reported being covered (76 minutes compared to 66 minutes respectively). It can be explained due to their place of residence, we can assume they live in periurban areas, or their work places are far from their place of

residence. A further research is needed to understand this phenomenon;

- More than half of those who reported not having a public transport station close to their place of residence, have to walk more than 10 minutes, and even more than 20 minutes to reach the closest bus station;
- Public transport means are, generally, available in the mornings;
- Public transport means are, generally, available in the evenings but in a less frequency than the mornings (64,2% stated being covered in the evenings compared to 88,6% in the mornings);
- Accessibility time to the closest bus station is, generally, good (73,6% reported that they have to walk less than 10 minutes to reach the closest bus station);
- Frequency of buses is very bad;
- A big proportion of our interviewees reported taking taxi, at least sometimes, at the end of work, and this issue is much worse for those who reported a lack in public transport's coverage in the evenings;
- Females spend more time in public transport means than men do, 77 minutes compared to 64 minutes respectively; we have suggested as hypothesis that males tend to travel more than females but this result has made us doubt our hypothesis. However, we cannot confirm nor deny it since we do not have enough data.
- Fares of buses are, generally, acceptable;
- Fares of taxis are, generally, high;
- Low income individuals and university students constitute the biggest proportion of those who think that fares of buses and taxis are high;
- Security levels inside buses and in bus stations is very weak;
- Quality of buses' driving was measured by our interviewees as risky;
- Although handicaps do benefit from transport services for-free, but their integration remains very weak. It can be improved by a proper configuration of buses and sidewalks.

This paper used five criteria to investigate social exclusion in public transport services in the Wilaya of Batna. It was found that three out of five are showing negative results, hence our main hypothesis is acceptable here (there is social exclusion in public transport services in the wilaya of Batna).

5. CONCLUSION:

Providing adequate public transport systems is a struggle against poverty since it aims to help people to find jobs or to sustain a very low paying job, to send children to school, to guarantee the access to all economic and social activities, etc. It is obvious that for getting a consolidated social cohesion, it is important to develop an efficient and equitable transport system.

Department of Transport has to upgrade the service quality of public transport regarding the spatial and temporal coverage in the evenings, many of our respondents, and we ourselves, find a deficiency in this aspect. To do so, we suggest establishing an organizing authority to control the function of the public transport system.

Promote the security inside buses, in bus stations and the driving quality of buses is not the responsibility of the local department of transport, it is the responsibility of the local force department. However, the Department of Transport has, more or less, a role in controlling the buses' driving quality if it establishes an organizing authority through supervisors or controllers.

At last, we have to emphasize on the necessity to make big efforts to integrate the category of people with special needs for they are completely excluded from the public transport services.

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