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**Methodologies and tools to evaluate issues relating to land-use and /  
or social aspects of urban transportation policies:**

**An accessibility concept linked approach**

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***Abstract***

Transportation policy issues are important in urban areas since they try to answer growing preoccupations. Nevertheless, do assessment tools enable the evaluation of social equity? In the French case, assessment methodologies - cost-benefit analysis - have been developed to make allowance for more elements. Even if economic and environment aspects could be evaluated for each urban transport system user, analysis does not linger over individual impacts. The question of social equity is either in the background or is not analysed, in both transportation policies and methodologies assessment.

However, literature review and decision-maker's speeches on equality show us a re-emergence of the social field in transportation policies. This appears with values of individual "rights" and "chance". By consequence, we interpret the equal opportunity between individuals by the accessibility concept. Accessibility is one of the basic approaches to the question of the social aspects in transportation policies. In order to take into account for social field and to answer accessibility to what, for whom and how?" indicators based on an "differentiated accessibility" could be established. These indicators would propose a tool that would make it possible to light the decision makers and to account for individual inequalities, considered in terms of chances to profit from the amenities of an urban area that they need to achieve their goals.

***Proposition of abstract to main topic:*** Assessment, Appraisal and Scenarios

***Keywords:*** Accessibility, assessment, equity, methods, social field

## INTRODUCTION: CONTEXT

Modifications of geographical spaces and social rhythms in urban areas contribute jointly to an evolution of the relation between individuals and territories. These modifications are characterized in terms of mobility by an evolution of concepts of distance and proximity. Individuals' motorized travels are all the more longer and more complex. The development and the generalization of the car use are at the origin of these changes. These evolutions cause the phenomenon "of urban spreading out" and cause, according to M Wiel (1999), the transition from the pedestrian city to the car town. The evolution of the urban development is one of the consequences of the increase in the distances from travels. Indeed, as soon as the speed of travels increases, individuals do not capitalize time saved to allocate it to their activities. On the contrary, it was reinvested on accessibility conquered on urban area, by an increase of travel length. The evolution of transportation's technologies and modes, by the generalization of the car use, improves the geographical accessibility of the urban territories considerably. These transformations have as a consequence a change in the relations between individuals and territories.

Nevertheless, even if these evolutions of urban mobility involved advantages, they are not carried out without creating inequalities between individuals or urban territories. Urban mobility is forced by individuals' activity patterns. Territorial or social disparities jointly have consequences on mobility. One of the first consequences is that of access to a transportation mode. According to Sylvia Rosales Montano and al. (2002), transportation inflicts "constraints". These appeal to the concepts of freedom and equality, but also social integration of individuals. Then, the question of transportation right, and moreover, the questions of equal chances to amenities are asked. Because of these disparities, individuals do not have all the same chances - capabilities within the meaning of A Sen (1985) - to access the amenities of the city.

However, the social assertion leads people to move according to increasingly complex activity patterns. This is a strong requirement of social and professional participation in social relationships. "*Confronted with such a need, individuals appear unequal, with unequal aptitudes for travels, or holders [...] of "spatial capitals" which enable them more or less to put their mobility at the service of a personal or social success.*" (J-P. Bailly, 2001). This implies that one of the issues of urban mobility is connected with the problems of equal chances. Mobility is a right that everyone must have. To be able to benefit the whole amenities of urban areas refers to a question of geographical, physical or social accessibility for each person. That supposes that it is necessary to ensure a service, universal according to J-P. Bailly (2001), of which the goal is to promote equal chances between territories and persons so that they can enjoy opportunities of the city. That also led the decision makers to wonder about the transportation concept: "*of transported object, the traveller becomes the main subject, including during his travels. It is no longer only a question of masses transit, it is necessary "to serve the mobility" of individuals, that is to say to help them to organize their mobile life: at the same time, to facilitate it and promote him amenities*"(J-P. Bailly, 2001).

In urban areas, the daily individual mobility is forced by individuals' activity patterns. Evolutions of territories and social rhythms are at the origin of inequalities in terms of mobility. The mobility's inequalities analyses and the awakening in the

decision makers' speeches to the importance of social issues emphasize increasingly, values such as "right to transportation" and "right to amenities". S. Wachter (2001) says that while reconsidering the condition of equal chances for everyone, it is possible to take into account both individuals and inequalities with regard to what they want to get in the city. By taking into consideration situations of the various categories of population relating to their needs and their capabilities through the unit for amenities, we can treat conditions of equal opportunity between individuals.

## 1 ASSESSMENT PRACTICES OF URBAN TRANSPORTATION POLICIES

Urban territories are privileged places of the complex public action. Decision issues and the public strategy are consequent in these places accommodating the majority of the national population, and this, all the more than the [transportation] policies are democratized and become more and more complex. Transportation policy issues are all the more important in urban areas since they try to answer growing preoccupations such as sustainable development. "*Development, that is to say the needs for humanity, supposes to be sustainable, not to build itself its own barriers. Consequences, with means and long terms, of the selected orientations should not have reach social, economic, biological and environmental impasses*" (Planet's Summit, Rio de Janeiro, 1992). Sustainable development has simultaneously three aims, which are the environmental integrity and respect, equity between individuals and generations, and finally, economic effectiveness.

How to take into account these new interests in the decision-making? Decision-making help's tools, and transportation policies assessment are significant to make it possible to decision makers to account for the effects of a policy with regard to these interests. "*Assessment is the judgement of the public interventions according to their results, their impacts and needs that they aim to satisfy*" (DGD, 1993).

In two decades, assessment procedure of urban transport projects have evolved: attempt at institutionalisation, widening of the evaluation and the decision to a great number of actors - in particular through the public discussion -, methodological projections with the sight of new problems such as the environment.

Twenty years after the beginning of this process, we could expect a deeply transformed situation of the evaluation concept and his practice. It appears indeed that evaluation became a political reality integrated by the various public action actors. This political reality was expressed through various laws (LOTI, 1982; LAURE, 1996) and through circulars (IDRAC, 1995; Brossier, 1998). However, the assessment situation denounced in 1983 ("*Public policies evaluation, that is to say the appreciation [...] of the real effects of public decisions is in France in a paradoxical situation of wish and ignorance*" (Nioche, Poincard, 1983)) is still a reality. In the case of *ex-ante* evaluations, many basic reserves appear as for their applications. Even if methodologies evolved on the form, as C. Duchène (2000) quotes it, the practice shows that evaluations are limited to the only measurable and direct effects. On the other hand, the appropriation of this decision-making help tool is not always made, even if the local communities' implication in the processes is more significant over these last years.

The institutionalisation process is also to regard with the methodological projections. They began, in the 1980's, by a harmonization of the methodological choices. This harmonization was materialized in 1994, by the drafting by the

“Commissariat Général au Plan” with the report called “Boiteux”. Cost-benefit analysis is the selected tool in order to clarify the decision-making.

Assessment methodologies have integrated economic dimension of the sustainable development and to a lesser extent environmental dimension. Inspired by the neo-classic economic theory and the utilitarian theory, the economic criteria arising from cost-benefit analysis are the model of the tools that allow to clarify the choices of public investments - in particular in transport. The aim of cost-benefit analysis is to evaluate all the advantages and financial or economic costs of a project of transport. If the criteria of evaluation are only financial, the assessment deals with only the financial dimension. But if this tool treats socio-economic criteria, it has to take into account of the whole of the costs and the advantages of a transportation project. Not only, can they be economic, but also environmental or social. Classically, the costs are, as well in the theory as in practice, the capital costs and the exploitation costs of the project.

In the advantages, we usually find time saved related to the project realisation. The evolutions of economic calculation made it possible to take into account other elements, such as safety (Boiteux, 1994), the congestion or the space's allocation (Boiteux, 2001). In practice, the appreciated advantages are primarily time saved and safety.

In the 1990's, an awakening of the environmental problems appears in political speeches. Those are translated at the legislative level by the law on the air and the rational use of energy (LAURE, 1996) and on the level of decision-making help tools, by methodological evolutions. It could be possible to consider the external effects related to the environment among the advantages or disadvantages of cost-benefit analysis. Boiteux reports (1994 and 2001) have officially integrated environmental dimension in economic calculation. However, taking into account the environmental effects causes many debates on the relevance of the results obtained compared to the current policies expectations. The environmental effects' analysis does not change the results and finalities of the assessment (Faire d'Arcier and Mignot, 2000)<sup>1</sup>. It does not correspond to decision makers' expectations with respect to these concerns. In a context where the environmental dimension is increasingly important, the economic calculation does not reflect the expected opinion and effects of the public action.

“Sustainable development” concept also tackles the question of social equity. At the opposite of both economic and environmental dimensions, social dimension, until now, is not taken into account in project assessment practices. Elements do not appear in the assessments results with regard to the effects of transportation projects on various categories of population. However, anyone is, at one moment or another, concerned with these transportation policies. The effects on each individual can be different and are not characterized necessarily and only by time saved. Policies can create, amplify or reduce inequalities, inequities...

Moreover, urban transportation' projects assessments are often socio-economic evaluations, which try to take into account the whole of the advantages and the

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<sup>1</sup> Only the time saved are represented in the results of the socio-economic evaluation of a transportation project, compared to the whole of the criteria selected and in particular the environmental criteria. This argument is to be emphasized only according to the purposes continued in the policies of transport.

disadvantages. Within this framework, not only the economic criteria, but also of other criteria such as the environmental effects or social equity are theoretically to be considered. Nevertheless, reality is very different since social dimension is not taken into account. Even if economic or environmental criteria can be evaluated for each user of the transportation system (time saved, or health consequences...), assessment do not present results on the effects of the project with regard to the various characteristics of individuals or the groups of individuals - for example, the losers and winners. Collective surpluses' variations are estimated - starting from the aggregation of the individual surpluses' variations - in order to give information as for the impacts of a project on the community. The collective surpluses thus do not permit to analyse the possible inequalities or inequities with respect to a transportation policy. So, the social dimension of transportation projects is not taken into account to clarify the choices of the decision makers.

At present where sustainable development concept is largely diffused, a revival of the existing assessment tools is necessary if one wants to take into account social dimension. Indeed, according to J. Vivier (1998), even if the evaluation procedures about the interest of the projects are not always used, the development and the revival of socio-economic methodologies [in a context of new concerns such as those of the sustainable development] of public transportation projects are necessary. The awaited benefits of urban transportation projects are within the framework of the quality of urban life and the general economy of the city. It is thus important to establish a new analysis framework, emphasizing the specificity of projects and policies. It is necessary to extend the field of evaluation to specific criteria to the urban transportation, in order to emphasize the contribution of these projects/policies compared to the urban development issues.

## **2 SOCIAL DIMENSION APPRECIATION**

Whereas the evaluation practices show clearly that the social issues of a transportation policy do not appear in the results of evaluation, the question of social equity is increasingly present in the decision makers' speeches. Since the transportation projects evaluations are socio-economic evaluations, they could not be limited to the only criteria of efficiency - of cost-benefit type. Even if the decision-making help's tools find their bases in economic calculation, they should also take account of two other dimensions of sustainable development: the respect of the environment and social equity.

### **2.1 Social / spatial issues related to a policy**

*"In all the decisions relating to transportation, there are winners and losers. It is not neutral policy on the matter. We can also say that the current system is not equitable"*(Banister, 1999). If we affirm that a policy is not neutral, we agree to take into account inequalities and the fact that political decisions generate winners and losers. A transportation policy can tend to answer social and/or spatial issues. What are social and spatial issues of a transportation policy? In order to answer this question, we start from a short terminological analysis on the principles of equality and the approach of equity.

What is concept of equality? In itself, the concept of equality does not have a body (Rosanvallon and Fitoussi, 1996). The difficulty of apprehension of this concept is due to its multidimensional aspect. Do we speak about which equality and which criterion of equality? But, *"the definition of the equality in one of its dimensions implies with the causal direction the acceptance of inequalities in other*

*dimensions*” (Rosanvallon and Fitoussi, 1996). To define the equality can only be made by the comprehension and the acceptance of unequal situations between individuals or territories. In public policies, three criteria of equality are often put forward. They are the criteria of equality of “right”, equal chances and equality of situation. They are identifiable in the legislative tools or the public policies, which are implemented by the decision makers. The Law of Transportation Orientation (1982) must ensure the first criterion (article 1st, LOTI). The second criterion relating to the equal opportunity is supposed to be at the heart of the public policies, which must ensure the access of individuals to goods and services. It is the same for the criterion for equality for situation: the public policies try to reduce the inequalities between individuals by redistributive actions or measurements. These two criteria are registered in the legislative tools (LOADT, 1995).

The field of urban transportation is a vector of inequalities or disrespect of at least one of these three criteria of equality. Mobility analyses are revealing differentiations and inequalities between urban territories, or individuals. That led decision makers to emphasize one of the values announced by the LOTI law, which is that equality of right like condition of equal chances. The right to mobility is a condition that decision makers take into account to guarantee to individuals a right to employment, culture, and leisure. Political speeches assert more and more this point in order to contribute to the social integration of each individual. In this way, we wonder about the measures to implement, but also about the decision-making help’s tools that could allow to highlight the decision makers’ choices with respect to these “social” requirements.

The policy’s spatial and social issues are directly related to these requirements of equality of rights and chances. But before arguing more on the perception of these issues, we analyse another concept that is not antagonistic with the equality concept. It acts of the concept of equity. According to Rosanvallon and Fitoussi (1996), equity is a property or the search for criteria of equality more demanding than those existing in a system. So, it is not opposed to the equality. This definition is close to the character and the judgement of an action or measures taken.

The literature largely tackles the question of equity, in particular in the transportation field. There are various approaches of equity. How to characterize this concept? In the “Theory of Justice” (Rawls, 1971), the criteria of equalities are identified by the principles of the justice that J Rawls proposes:

- *“each person must have an equal “right” to the widest system of freedom of bases equal to all, compatible with the same equal system for all;*
- *the economic and social inequalities must be such that they are:*
  - a) *for the greatest benefit to the most disadvantaged, within the limit of a principle of saving,*
  - b) *attached to functions and positions opened to all, according to the principle of the “right” equal opportunity “(Rawls, 1971).*

The first principle is attached to the criterion of individuals’ equality of rights, as it was written in the article 1st of the LOTI law in the transportation field: the “right” to transportation for an access to goods and services of an urban area. S Souche and C Raux (2000) define starting from this principle “*territorial equity*”. It characterizes a search for guarantee in any geographical space of a right of access to goods and services.

The second principle is linked to the equality of situation (a)) and chances (b)) criteria. S Souche and C Raux (2000) define:

- on one hand, related to equal chances principle, the “*horizontal equity*” in relation with equality between individuals in terms of treatment. It is heard a taking into account, in an equal way, of various individuals of territories;
- in addition, according to the situation principle, the “*vertical equity*” in order to take into account of social inequalities and redistribution phenomena.

These approaches of the principles of equality and equity let foresee that the social and/or spatial issues related to an urban transportation policy are complex. However, with the sight of the preoccupations in terms of sustainable development, a wish to consider social dimension appears, in particular while reconsidering these fundamental values of equality of rights and chances of individuals. Thus, to identify the social issues of an urban transportation policy we need to characterize the possible impacts or consequences on spaces and individuals of this policy. In such context, do utilitarian theory and cost-benefit analysis make it possible to allow for social dimension?

The definition that we use for social dimension is dictated by the words “equal chances between individuals”. It takes into account situations of the various categories of individuals with respect to their needs and their capacities (“capability” according to A. Sen (1985)) through the unit for amenities that an urban territory proposes to them.

## **2.2 To refute cost-benefit analysis to account for the social issues**

The design of economic calculation on the proposal to maximize the collective well-being can be characterized of individualist and sacrificial. It is indifferent to the questions of inequality. It is unaware of individuals’ variety, and the differences of distributions of goods between individuals. It does not make it possible to account for the rights and basic freedom of individuals, nor to identify the different situations of the various groups of individuals with respect to an urban transportation policy. Confronted with these criticisms, utilitarian theory had re-examined their copy while reconsidering some fundamental assumptions of the economic calculation theory. Nevertheless, this theory is always impotent to treat questions of equity clearly.

However, we must bring a reserve to this conclusion. Economic calculation could take into account the criterion of equality of situation by slackening the assumptions of optimal distribution of goods in the initial state of a system and identical marginal utilities for all the individuals. This remains tributary of criticisable fundamental assumptions. Are individuals’ choices really rational? Can we really measure the individual’s utility? Does utility consider the rights and freedom of individuals? Egalitarians currents thoughts affirm that it is not the case.

Moreover, if we accept the collating sequence of the justice principles of J Rawls, even if economic calculation would take into account the difference principle, it should account for the principles of a higher nature before: criteria of equality of right and equal chances. We saw that cost-benefit analysis and utilitarianism do not make it possible to consider these principles.

A last argument in discredit of utilitarian economic calculation concerns the assertion that social dimension is not measurable which such in an aggregate way. Indeed, according to C Gallez (2000), the social dimension’s indicators “*are not characterized by contents, but by a particular form of the analyses carried out*”



relative to the transportation project. The taking into account of social dimension requires an analysis disaggregated concerning the results of each measurable criterion of one project, in order to characterize the project's effects on each individual (or groups individuals) in terms of "right" and "chances". The maximization of the collective well-being does not make it possible to treat social dimension, because it rests on an aggregate and sacrificial vision of the society.

The somewhat offhand answer of utilitarians compared to these questions of social ethics is interpreted to us, perhaps in a caricatured way, by C Arnsperger and P. Van Parijs: *"One can judge and can shape intuitions with utilitarianism, but this one does not have to give up their diktats. No need, therefore, to subject the maximization of the well-being aggregated to the respect of a certain number of fundamental freedom in order to reconcile itself with "obsessed persons" by the humans right"* (C Arnsperger and P. Van Parijs, 2003).

Nevertheless, we maintain our position that is to affirm that the utilitarian theory - and its variation under the cost-benefit analysis - does not allow for social dimension. We interpret social dimension in terms of equal chances between individuals. This implies the consideration of the situations of the various groups of individuals with respect to their needs and capacities through the unit for opportunities. Also, we remind that the cost-benefit analysis evaluates the whole of the surplus variations of advantages and disadvantages before incorporating them.

Consequently, we could think that a desegregation of the surpluses by categories of individuals would certainly make it possible to analyse the various categories of population compared to the evolutions that an urban transport project could bring. If we move the objective of cost-benefit analysis and not seek systematically to provide a result on the collective well-being, it could be possible to take into account the social dimension. It is not the object of cost-benefit analysis. Utilitarianism and economic calculation seek to maximize the collective well-being (by aggregation of the individual surpluses). They provide a synthetic result of the collective well-being without distinguishing neither the social issues from transportation, "rights" and freedom of individuals, nor the plurality of people. Concretely, in order to consider social dimension, it would be interesting to head the social issues with quotation and then, define indicators that would be analysed in a disaggregated way. This requires surpluses' desegregated among the indicators selected. Consequently, we cannot name this potential tool "cost-benefit analysis", because it is not cost-benefit analysis that we think about. The utilitarianism aim is contrary to our ambition that is to consider and integrate social dimension - in terms of equal chances - in decisions help tools. One cannot make say to the cost-benefit analysis for what it is not made. The finality of the utilitarianism is different: "to maximize the well-being of the greatest number". Therefore, we affirm that the classical economic calculation theory and cost-benefit analysis, with the purpose dedicated by theoretical construction, moral or ethical, does not allow to concretely and precisely treat the social issues of an urban transportation policy or project.

Nevertheless, with the preoccupations in terms of sustainable development, the questions of social equity re-appear in the decision makers' speeches. It is affirmed while returning, within the framework in particular of urban transportation policies, with the values of individuals' chances. Equal chances are not only put on the front of the scene, in order to allow each one to profit from the amenities of urban territories. To allow this equal chances, the value of "right" for transportation is also proposed. This assertion "right to mobility" in order to contribute to an access to the amenities and more largely to the social integration of each individual results

in wondering about measurements to implement, in regard with this expectation increasingly more identified. This interrogation is all the more important as traditional economic calculation does not make it possible to take into account questions of social equity.

It should be interesting to implement a tool or measurements on the basis of theoretical bases further away from utilitarianism. We can think of more egalitarian bases in regard with the thought of J Rawls or the egalitarian thoughts.

For example, according to A. Sen, a person's life consists of a whole of operations dependent between them. These operations are composed of states and actions. If one considers a whole of different operating modes, an "*n-tuple*" of the operating modes (or a vector of the space of the possible operation modes) represents the principal characteristics of the person's life. Each component of the *n-tuple* represents the degree of achievement of a particular operating mode. The achievement thus represents the concrete realization of the *n-tuple* of operating modes. This thesis consists in affirming that "*operations are constitutive of the existence of the person, and that the evaluation of its well-being must necessarily take the form of a judgment on the components*" (A. Sen, 1992) of the "vector" of individual operation. From there, Sen defines the concept of "capability" as being a unit of vectors of operation in which a person has the possibility of choosing any vector of operation. Capability "*represents the various combinations of operations (states or actions) that the person can achieve. Capability is thus a whole of vectors of operation, which indicates that an individual is free to carry out such or such type of life*" (Sen, 1992). When these concepts were established, real freedom that has a person to choose between various lives is the whole of capabilities.

If the realization opportunities are the translation of capabilities of the individuals, they leave the field of their responsibility. Thus, by equalizing the realization opportunities of individuals, it is a question of providing equal chances between individuals with respect to opportunities that they get. To treat social justice of the evaluation consists in identifying the valuable articles, the realization opportunity of individuals (capabilities). Thus, this approach conceives taking into account the equalization of capabilities to function of the individuals, by considering the space of possible operations.

### **3 FIRST CONCLUSIONS AND PROBLEM**

The social dimension of sustainable development becomes increasingly important in the investment choices and the implementation of the transportation policies in the urban environments. Whereas this dimension is posted in the name of a research of social equity, the evaluation tools and methodologies of transportation projects do not allow to inform the decision makers in terms of equal chances.

In the usual assessment practices of urban transportation projects, only two of three dimensions of the sustainable development are taken into account. Economic dimension is the first to be actually considered, in conformity with the cost-benefit analysis and the evaluation tools that are inherited from the neo-classic and utilitarian economic theory. But, since the 1990s, an emergence of the environmental problems appears in political speeches. That results in the implementation of methodologies that make it possible to bear in mind the environmental consequences of a transportation project. Nevertheless, the integration of the respect of the environment, in the facts just as in the assessment

results, does not make it possible to answer decision makers' expectations. Moreover, social dimension remains large absent in evaluation practices.

These observations are similar since we are interested in the evaluations of lawful tools of urban transportation projects. The reports of the "Commissariat Général au Plan"(Boiteux 1 & 2, 1994, 2001) on the choice of investment of the transportation projects were the occasion to harmonize the methodological choices - by cost-benefit analysis. That also made it possible to officially take into account social dimension in economic calculation and the evaluations of the projects of transport. Just like the circulars Idrac (1995) and Brossier (1998), the questions of social equity are not considered in the decision-making help tools. It is the same for some reports coming from of the French Ministry of Transport (Bernard and Bureau, 1996; Quinet, 1997).

The social questions raised by the urban transportation are well recognized and emphasize issues and fundamental values (equal chances of the individuals), without being taken into account either in the theoretical plan, or in the practices of evaluation. The carried out analysis shows us many limits of the utilitarian theory and cost-benefit analysis, in front of the social dimension. Even if those can consider the criteria of redistribution of goods between individuals, they do not make it possible to clearly account for the criteria of "right" and chances of people. In fact, the hedonist and reducer character of the human subject in the utilitarian economic theory does not allowed to treat equal chances and questions of equity.

We could think that social dimension could be analysed and integrated by moving the objective of the cost-benefit analysis without seeking systematically to provide a result on the collective well-being. It is not the aim of the cost-benefit analysis. Utilitarianism and economic calculation seek to maximize the collective well-being. They provide a synthetic result of the collective well-being without distinguishing neither the social issues from transportation, "rights" and freedom of individuals, nor their plurality. Questions of social dimension - or at least of one of these aspects as we defined in terms of equality of chances - are opposed with the finality of utilitarianism ("to maximize the well-being of the greatest number"). Consequently, the first conclusion that we reach is to affirm that the classical economic calculation theory and cost-benefit analysis, with the purpose dedicated by theoretical construction, moral or ethical, do not make it possible to take concretely and precisely into account social dimension and the questions of social equity of the urban transport, in the decision-making.

Nevertheless, mobility is forced by individuals' pattern activities. Evolutions of urban territories and social rhythms are at the origin of inequality in terms of mobility. Analysis of the mobility's inequalities and the progression of the social question in the decision makers' speeches emphasize increasingly marked principles such as the right to transportation and the right to the amenities present in the city. Because of social space disparities, individuals do not have all the same chances to profit from the amenities that the city proposes. However, the access of all individuals to opportunities of one city melts the right to transportation like condition of equal chances for each one. We saw that S. Wachter (2001) affirms that it is while reconsidering these values that it is then possible to take into account the whole of individuals who want to profit from the amenities suggested by the city.

Moreover, the questions of social justice are tackled in the reflections in terms of economic and social ethics (A. Sen). These reflections resulting from the

egalitarians currents of thought stress the fact that a minimum of social justice requires the search for equality between individuals, and in particular the search for equal chances. The egalitarians grant a central role to the individuals' choices and recommend evaluating their chances or opportunities. Even if these egalitarian theories approach relatively complex concepts, these theories get a new legitimacy - compared to the traditional vision of the economic ethics carried by the welfarism and utilitarianism - as regards measurements of opportunities and the advantages of individuals. According to Fleurbaey (2001), these egalitarian designs allow a theoretical anchoring in order to develop analyses of inequalities determinants, and in particular in the field of mobility.

Thus, the questions of social equity in the urban transport and the philosophical designs of implementation of a social justice are joined through the concept of equal opportunity between individuals. Consequently, we affirm that it is possible to identify social dimension or, at least, an aspect of this dimension compared to the questions of equal chances. For that, we propose to interpret the values of chances through the concept of accessibility. We define accessibility as the capacity to more or less easily reach goods, services or activities wished by individuals living in urban areas. This one is also the representation in time and urban territories of individual component (socio-professional profile...), which is affirmed in relation to the transport and localizations' systems.

*We conclude that it is indeed possible to account for the social dimension of the urban transportation in the decision-making. We propose to treat of social size by interpreting the questions of social equity through the concept of accessibility, directly linked to the theories of the equal chances. It would be then interesting to implement measurements or indicators - for example, to determine the situations of the various categories of population -, on the basis of egalitarian theories. The objective of our work is to see how the accessibility concept could inform the choices of the decision makers on the questions of social equity in the urban transport. The evaluations would be seen then equipped with tools making it possible to inform the debates and the decision makers on three dimensions of the sustainable development.*

#### **4 EQUAL OPPORTUNITY, EQUAL ACCESS TO THE AMENITIES OF URBAN SPACE?**

When we talk about equal chances between individuals, we must ask the question that A Sen raises, that is to say, which equality/inequality do we want to treat? With what do equal chances between individuals refer? According to terms' of A Sen, to want to treat equal opportunity of individuals refers to the equalization of capabilities of individual operation. Indeed, capabilities of operation and capabilities to achieve represent possibilities, chances that an individual can have as for the achievement of his objectives. Thus, capabilities can be perceived, within the meaning of A Sen, like an indication on individuals as for their freedom to carry out such or such life. And this, knowing that operations are constitutive of the person.

Applied to an urban territory, how can the possibilities or chances that an individual or a household has to carry out his objectives be characterized? Urban area is built on the relation between individuals, between material objects or not, merchants or not. Urban space proposes to individuals a whole of amenities as various as varied. These amenities are activities, goods or services. The existence of

amenities corresponds, in a simple idea, with an economic logic of supply and offer. Thus, they try and tend to answer at the individuals' request, so that they can achieve their intentions and/or can appease their needs. Nevertheless, it is not necessarily because there are amenities in urban territories that individuals can carry out their objectives. Do individuals have the same possibilities or chances compared to the amenities suggested, and compared to their personal or common objectives (if it is of a household or a group of individuals) of realization? A bond takes shape between the question of equal opportunity between individuals and the question of possibilities of realization of individuals compared to the amenities that they can need. We can interpret then the problems of the equalization of individuals capabilities by one on the equalization of the possibilities that have individuals by taking account of the wished amenities (activities, goods and services). While taking account of this bond between equal chances, capabilities of realization and the urban territories opportunities declined in amenities, we will worry about the relation of individuals/households to the amenities, and chances that they can have compared to these amenities and their possibilities of reaching it. The equal opportunity is declined by the question that we will treat, namely: *“can there be an equal access to the amenities of urban territories, for each individual in order to achieve their intention?”*

## **5 PROXIMITY, QUALITY OF LIFE AND EQUAL CHANCES**

Beyond the relations between accessibility with opportunities and the various component urban area systems, the accessibility concept is to bring closer the concepts of proximity of opportunities and quality of life of individuals or households.

Public policies, as well as the field of research were invested in the topic of the quality of life of the urban populations. The objective of research as of the decision makers is to improve quality of the life of individuals by the implementation of urban developments and an offer of services, goods or activities that are more adequate with the populations' needs. The relevance of the carried out actions is declined in terms of accessibility, of diversity of goods, versatility of equipment closed to residence places of households on the districts level. These actions are interested just as easily in the social equipment, the health services, the equipment sporting, cultural, with the trade, etc. They try to consider the whole of opportunities that an individual or a household will need in order to be carried out in urban area in which he/she lives. In fact, to improve quality of life, compared to various social times (working times and times except work allocated with the domestic tasks, with the presence of children in the household...) amounts as directing reflection as well towards the existing activities, the quality of services, the proximity of goods that individuals wish as on questions of accessibility.

The concept of “quality of life” applied to urban territories is declined mainly in two ways. First of all, a way of conceiving it consists in being interested in the natural environment of the urban territories (according to Perloff, 1969). It is a question of being concerned with environmental conditions (as well on questions of air or sound pollutions as about the questions of parks adjustments...).

Nevertheless, we will consider the other main approach. One cannot speak about quality of life without evoking the populations' environment in the districts. It is thus a question of being concerned with unequal advantages that populations have with respect to opportunities (activities, goods, services, equipment...) that the

various territories of urban space propose to them. Which are the individuals' equal/unequal chances to meet their need compared to the amenities that they have need? One of the factors of improvement of the living conditions of a district relates to the improvement of accessibility concerned to amenities. The accessibility improvement is understood, not by the systematic and sector-based development of the urban transport offer, but by a global reflection as well on amenities offer, needs and evolution of the temporal and space rhythms of individuals as mobility questions. It is a question of carrying a reflection on the proximity of goods and services in the districts. We are also interested in unequal chances of populations (on intra and/or inter-districts) compared to the distribution of amenities (not only in terms of existing, but also in terms of quality of the services) suggested in urban space.

The importance of urban populations quality of life, as well at the macro-territorial as micro-territorial level, appears with the question of the proximity services development. This preoccupation of urban actors is the result of new increasing requests of individuals in terms of services, of goods necessary to their personal realization. These requests of urban populations are the reflection of the evolution of temporal rhythms, of individual or collective social rhythms (desynchronization of various social times). It translates not only the question of the "lack of time for to do everything", but also gap of social accessibility (accessibility to a place, to an activity which an individual needs, or temporal accessibility), which is not without consequence on quality of life, perception of living conditions and on equal chances between individuals in urban territories. The temporal and urban desynchronization reveals, for example, a request increasing for widening of the services openings hours (administrative, trade...), inequalities between men and women announcing a request increasing for services of assistances to residence, care or services available to the parents of a household (for example, services related to children), of unequal chances between individuals and urban territories... Analysis of the evolution of the ways of life of French, carried out in work of F Godard et al. (2001), shows the necessity to develop new services in order to answer the urban populations expectations. Nevertheless, according to the authors, even if these new services would represent a "formidable layer" in terms of urban economic development, their absence, as well at a territorial level (localization of activities) as in the various moments of the day deprives the individual achievement and blooming. *"Moreover, a deficit of this nature could amplify social and cultural inequalities"* (Godard and al, 2001) between the various categories of urban population.

In such a context of evolution of the urban social rhythms and temporalities, the increasing population needs are thus translated by the development of services and in particular of proximity services. This development should tend to satisfy quality of life of populations as well in regard to the existing services in territories as theirs qualities.

Consequently, as questions of equal chances are closely related to individuals' quality of life with an aim that they can achieve theirs needs with respect to the urban space amenities, we introduce accessibility concept through these problems. What access do individuals have for? Who has access to the amenities? Are not there disparities and inequalities between individuals or urban territories? What we translate by "Accessibility to what, for whom and how?"

## 6 AN INTERPRETATION OF THE EQUAL CHANCES: ACCESSIBILITY

Mobility is the character of what can move or change position. However, travels are not an end in them. While moving to achieve such reason, individual wishes to reach, since his starting point, a place and an amenity. Thus, the accessibility concept appears in their movement.

Access to the various activities suggested by an urban territories finds the “right to transport” like condition of equal opportunity for each one (LOTI law, article 2, 1982). Moreover, “equal opportunity” between individuals is present in the concerns of decision makers. It is registered in the French legislative tools, such as the Law of Orientation for the Installation and the Development of the Territory. Indeed, the main preoccupation is to provide an equal access to all individuals to services, activities as various as education, health, culture... in order to answer their expectations. The accessibility concept is the central place of criterion of equal chances.

Then, we find again the equal chances concept that the egalitarian theories proposed to treat question of social justice.

How can we then interpret this equal opportunity including equalization of capabilities or equalization of individual appropriateness realizations? How to take into account situations of various categories of population with respect to their needs and/or desires and their capabilities through the unit for opportunities that proposes the urban territory in which they evolve?

We propose an interpretation of social dimension in terms of equal chances through the accessibility concept. Why accessibility?

When we talk about equalization of individuals operations’ capabilities within the meaning of A. Sen, it is to be interested by possibilities, chances that a person has to carry out his objectives and to achieve him. Their objectives or achievement are needs or desires<sup>2</sup>. Among the whole of needs and desires, individual can want to benefit, for objective goals or his personal social valorization, of the unit or from part of opportunities (goods, services, health, culture, education, work...) that urban territories propose. Consequently, the achievement of these needs or desires asks the question of access to amenities. It is important that individual can reach these urban opportunities to satisfy his will of achievement. Moreover, it is because people are different that differentiations or inequalities exist in the achievement’s space, for each one among us, of our needs and our desires. Other factors can also produce, reproduce or reduce these differentiations or inequalities. All the more compared to the individuals’ needs, are they equal in chances compared to what urban territories offer them?

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<sup>2</sup> We distinguish the need for the desire, even if these two terms are often confused. We propose to present definitions given by Sylvain Reboul (1999) of need and desire:

Need is “*the tendency which seeks a means determined in order to obtain, according to given relations of cause for purpose, a particular end and objectifies given.*”

Desire is “*the research of the happiness defined as the satisfaction [...] produced by the recognition by the subject conscious of itself, of its personal and/or collective value; to be happy is to satisfy its self-love in satisfactory relations, i.e. developed and developing, with the others, themselves subjects of desire*”.

“*The subjective satisfaction of need is only the means and/or the sanction of objective ends and is subordinate to them. The need aims at the pleasure “of, by and for something”; For the desire, on the other hand, the ends objectify are only means of the subjective end which is happiness in the self-love and are to him subordinates. The desire aims at the pleasure self-status-enhancing “for itself” (Reboul, 1999)*

It is in this particular context that we propose an interpretation of the equal chances through the accessibility concept. We now propose a presentation and give a definition of the accessibility concept.

## 7 ACCESSIBILITY AND URBAN INTERACTIONS INTERPRETATION

Accessibility is the great facility to reach, since a place of urban territories, amenities (employment, services, leisure, activities...), by one or more individuals who travel using one or more transportation's mode. It is often characterized by a volume of amenities of which can potentially profit one or more individuals from a place given inside the urban territory considered for a level of constraint fixed beforehand. Within this framework, since a potential volume of opportunities characterizes it, we speak about potential accessibility.

This definition of the accessibility concept does not only refer to the individuals' potentiality to reach urban space amenities. Urban space is composed of a whole of systems arranging the ones with and compared to the others. Urban environments could be interpreted as being the overlap of three systems (transportation system, dynamic urban localization system and practices and social relations system).

The definition selected of accessibility takes into account the elements composing the urban transportation system, and so elements composing the dynamic urban localization system. Accessibility depends not only on the places of origin and destination of individuals' travels, on the activities available in urban territories, but also on the structure of the transportation networks, on the level of service, on topographic constraints, on the transportation mode, on the regulations, etc.

We distinguish in the urban areas two other components (or systems), which have a cardinal importance in the definition and the interpretation of accessibility. It is about a temporal component and individual component. The temporal component of urban characterizes various temporalities, those of activities, and those of individuals. The individual component, as for it, takes account of the various categories of population evolving in urban territories.

Thus, the definition of the accessibility concept refers to relations of individuals in a given territory and to elements of the space-time systems of urban area. Access to amenities can be regarded as being the result of four components:

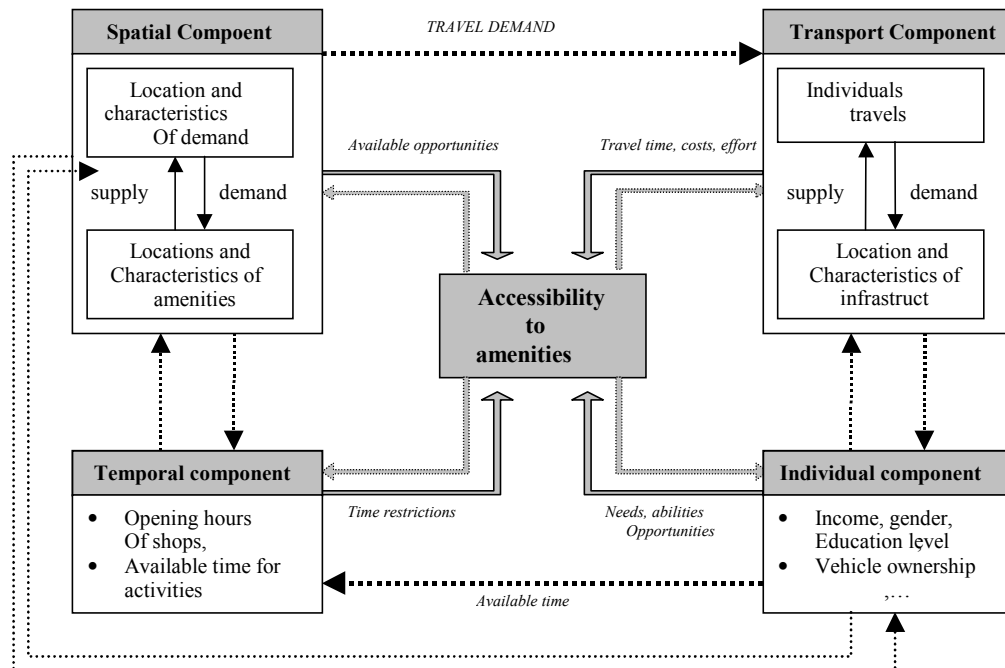
- a spatial component: it influences accessibility by determining the amenities available. It is the result of confrontation between, on the one hand, localizations and characteristic of individuals, and, on the other hand, localizations and characteristic of amenities of urban area. The spatial distribution of amenities, just like the spatial distribution of request (inhabitants) with respect to amenities, influences accessibility of individuals, by a confrontation between supply and offer;
- a transportation component: it determines the conditions of accessibility in terms of time, costs or efforts required by individuals. It is characterized by citizens' travels, characteristics of networks and transportation's infrastructures. It translates the result of the confrontation of supply and demand of travel, determining the spatial distribution, times, costs of travels and the effort which individuals provide to reach the amenities;
- an individual component: it represents the social and professional individuals' characteristics. It establishes needs, capacities and opportunities of individuals in



terms of accessibility. The characteristics of individuals are an important part on the level of accessibility to social and economic activities;

- a temporal component: it represents the temporal restrictions of access to goods and services. Precisely, it takes into account the availability of activities at various times of the day. It also takes into account time that individuals allot to these activities - time during which an individual occupies the activity is not necessarily available to other individuals.

**Figure 1: Relations between the various components of accessibility**



Source: according to Geurs and Ritsema (2001)

These various components are not independent to each other.

The spatial component is in relation to the transportation component. The spatial distribution of activities and residences creates a request for travel on behalf of individuals who wish to carry out their activity patterns. In addition, the transportation component and the spatial component do not remain static in the urban environment. Transportation's users define their localization's choice according to accessibility with the various networks systems and activities or services areas. Any modification of one of the two components (transportation system or activities localization system) assigns the conditions of accessibility of citizens to the various territories of activities. Therefore, after the individuals' behaviours adaptation, consequences of modifications will go directly on residential localizations.

The temporal and spatial components of accessibility are also interdependent, since individuals can go only to one place at a given moment and for a certain travel time. In addition, the distribution of activities can introduce restrictions into the temporal component (opening hour of the activities...) or influence on the needs for individuals.

Lastly, the individual component of accessibility is related to the three other components. It is connected to the temporal component, by the serviceable time that individuals allot to the realization of their activity patterns. It is related to the spatial

component, by the spatial distribution of residents in urban area and by the “request” for opportunities - i.e. by the need that have individuals to reach or to get the various amenities located in urban territories. Lastly, the individual component influences the component transport (request for travel, realization of the social and spatial mobility).

S. Masson (1997) says, “*Accessibility can be regarded as the vector of the interconnection between the transportation system and the localization system*”. At the sight of the diagram presentation carried out, we also define accessibility as the representation in time and urban territories of the individual component, which is affirmed in relation to the transportation and localizations’ systems by differentiated social and spatial mobility.

## **8 OBJECTIVES OF THE SOCIAL ISSUES ASSESSMENT: ACCESSIBILITY TO WHAT, FOR WHOM AND HOW?**

The objective of our future work consists, by the placement of “accessibility differentiated” indicators, to highlight in urban territories (district, commune...) activities to which individuals or groups of individuals have access. In addition, the objective is to know which are the groups of individuals who profit from accessibility to amenities of urban area. Lastly, the objective has as an ambition to implement, on a given urban territory, measurements identifying and characterizing the evolution of the situation of various categories of population in terms of accessibility to the activities. What we could summarize by “*Accessibility to what, for whom, and how?*”

### **8.1 Accessibility to what?**

The first point relates to the implementation of an analysis of accessibility of individuals to one(s) basket(s) of goods. By basket of goods, we understand a whole of amenities distinct from urban area. Amenities of urban area are defined as being approvals or opportunities that is proposed to individuals. These opportunities can be employment, education, health, banking services, trade, leisure, the services in relation to children, that are located precisely in urban territories (on a infra-communal level). Then it will be a question of defining goods that individuals need and that will constitute the basket(s) of goods. These goods will be given in urban geographical territories and also according to the life profiles of individuals. While the individual mobility being forced by the their activity patterns, it is using a socially (according to the various categories of population) and spatially (localization of individuals and activities in territories) differentiated analysis that will be given the basket(s) of goods.

The objective is to see, initially, up to what point individuals or groups of individuals have access to the determined baskets of goods. In the second time, it is to analyse up to what point a urban transportation policy makes evolve individuals’ accessibility to these baskets of goods. Do individuals or groups of individuals have the same conditions and the same chances - socially or spatially - access to the various activities that constitute the baskets of goods?

### **8.2 Accessibility for whom?**

We propose a socio-economic characterization of the various categories of population with respect to the various situations of accessibility (and its evolution, following a policy of transport) with the activities of urban area. It will be a

question of defining a typology of categories of individuals, in close connection with the baskets of goods. Indeed, according to individuals/households' profiles, the baskets of goods desired or necessary are not identical. So, as for the definition of the baskets of goods, typology will be given starting from an analysis differentiated from individuals/households and their requirements and/or desires in terms of goods. This typology will also take account of the urban territories (local at the infra-communal and total level on the whole of the territory of urban area) in which individuals evolve. The analysis will be able to be carried out in a disaggregated way (position in the cycle of life, PCS, presence or not of children in the households, sex, incomes, level of diploma, culture...). This desegregation will make it possible to account for the conditions determining the various situations of groups of individuals compared to their needs or desires in terms of goods. Moreover, this analysis could be carried out only jointly with the description of the baskets of goods.

This approach aims to clearly give an account (initially without and, in the second time, with a transportation policy) of the social profiles of various individuals, in terms of equal chances, by taking into consideration the situations of various categories of individuals with respect to their needs and their capacities ("capabilities" according to A. Sen (1985)) through the unit of opportunities that the urban territory proposes to them.

Lastly, we propose the description of the conditions distinguishing the situations from various categories of population in terms of accessibility, compared to evolutions of the various urban area systems. The aim is to characterize under which conditions individuals are distinguished according to these evolutions. These evolutions (transportation system and/or activities localization system) can depend directly or not on an urban transportation policy under consideration by the decision makers. This objective can inform the decision makers about the policy which they wish to implement, on a social purpose, namely does their transportation policy support an improvement of social accessibility, in terms of equal chances? The finality is to be able to account for the impact of an unspecified policy of urban transportation on needs for the various groups of individuals in terms of goods.

It is then necessary to relativize the concepts and measurements of accessibility to activities of urban area. More precisely, it will be a question of taking into account the distribution in urban territory or between individuals - or groups of individuals - profits or losses of accessibility. That is considered by taking account of the "initial" distribution (before any urban transportation policy/project) of accessibility with activities (baskets of goods). Indeed, the activities and citizens' localizations in urban territory are not homogeneous. So the levels of accessibility as well as the profits or losses following an urban transportation policy (measured in volume of accessible activities) are not homogeneous in space nor between individuals. Thus, by holding account, on the one hand, of the precisely distribution in urban area (on an infra communal level) activities and individuals, and on the other hand, socio-economic characteristics of individuals (returned, PCS, position in the cycle of life...), the aim is to propose the criterion of equal chances with respect to evolutions relating to accessibility to activities which proposes urban area.

### 8.3 How?

The first phase of our work will thus consist with working from a theoretical as well as from a pragmatic point of view of indicators likely to answer our problematic. So, we will have recourse to a bibliographical analysis on the various categories of indicators of accessibility (isochronous, model gravitating...). It will carry us out to specify the use of these categories of indicators for our problem. We will define, by an analysis differentiated from the population and activities (goods and services) present within the territory, on the one hand a typology leading us to characterize various groups of individuals, and on the other hand, basket of goods which individuals can have need or wish. The characterization of the various categories of individuals will take account of the socio-economic characteristics of individuals (position in the cycle of life, incomes, statute...), but also of spatial localizations of population on the studied territory. Lastly, the determination of the baskets of goods will be carried out in two times. First of all, we will have an analysis of the baskets of goods by the literature over "social times". According to Edmond Herve (2003)<sup>3</sup>, various social times (working time, times except work) are the revealing ones and factors of inequalities. The apparent stake behind the control of urban times is well that of accessibility for all to the urban activities (baskets of goods)<sup>4</sup>. This analysis of the literature will allow a non-normative approach of the definition of the baskets of goods. Nevertheless, in the second time, the determination on our study will be carried out starting from the analysis, according to the typology implemented, of the individuals activity patterns and according to data bases available.

These differentiated analyses (determination of the baskets of goods and the typology of the categories of the population) will constitute the base of indicators making it possible to treat equal chances, by a differentiation in three levels: according to the activities, according to individuals / householders and territories (at the infra-communal level) of urban area. At the second level, after having implemented the indicators of accessibility, the aim will be to test its validity and to produce the first analyses on the territory selected.

Lastly, the last stage will consist of, following the analyses which we will have obtained, testing the evolutions of accessibility and the criterion of equality of chances between the various categories of individuals with respect to what they wish to get in urban space, according to urban transportation projects/programs.

### CONCLUSIONS

We saw that, in the French case, urban transportation policies/projects assessment had made much progress these last years. Nevertheless, whereas new concerns such as that of sustainable development are affirmed more and more, evaluations do not make it possible to account for the whole of three dimensions that are the respect of the environment, the economic effectiveness and social equity. It is possible to deal with the first two dimensions.

Economic dimension is the first one to be taken into account, in conformity with the cost-benefit bases of the analysis and the tools for evaluation, which are in the

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<sup>3</sup> Meeting Jacques Cartier, December 1, 2003, in Lyon: New urban rates/rhythms: their effects on travels and mobility

<sup>4</sup> Accessibility is understood as being the capacity to reach social realities to which individuals need.

neo-classic and utilitarian economic theory. But, as from the 1990s, an emergence of the environmental problems appears in political speeches. That results in the implementation of methods that make it possible to consider the consequences environmental of a transportation project. Even so, the taking into account of the respect of the environment, in the facts just as in the results of evaluation, does not allow answering the decision makers' expectations. The social questions raised by the urban transportation are well recognized and emphasize issues and fundamental values (individuals' equal chances) without being considered neither in the theoretical plan nor in the assessment practices. Analyses show many limits of the utilitarian theory and analysis cost-benefit to take into account social dimension in the decision-making. Our first conclusion is thus to affirm that the tools for socio-economic evaluation, resulting from the utilitarian theory do not permit to account for the social dimension and the questions of social equity in the decision-making. The aim of cost-benefit analysis does not be interested in equal chances, because its finality is very different: to maximize the collective well-being.

Nevertheless, the questions of equal chances re-appear in the decision makers' speeches and the egalitarian thoughts in economic and social ethics. The questions of social justice are tackled in the reflections in terms of economic and social ethics (Sen, Arneson, Cohen). They stress the fact that social justice requires the search for equality between individuals, and in particular the search for equal chances. Egalitarians grant a central role to the individuals' choices. They recommend evaluating individuals' chances or opportunities. According to Fleurbaey (2001), these egalitarian designs allow a theoretical anchoring in order to develop analyses about determinants of the inequalities between individuals, and in particular in the field of mobility.

The questions of social equity in the decision makers' discourses, in connection with the urban transportation, and the philosophical designs of implementation of a social justice are linked through the concept of chances equalization. Consequently, we affirm that it is possible to identify social dimension or, at least, an aspect of this dimension compared to the questions of equal chances. For that, we propose to interpret the values of chances between individuals through the accessibility concept. We define accessibility as the capacity to more or less easily reach goods, services or activities wished by individuals living in urban area. This is the representation, in time and urban territory, of individual components (socio-professional profile of the individuals...), which is affirmed in relation to transportation and localizations' systems.

Thus, our objective is to build a tool, which makes it possible to clarify the choices of the decision makers as for their project of urban transport, on unequal/equal chances. This tool is built to treat social issues of urban transportation and precisely to bring brief replies to the question "Accessibility to what, for whom and how?" Therefore, we propose an analysis disaggregated of accessibility indicators according to three fields (amenities necessary to the achievements of individuals, categories of individuals (who can have distinct needs and capabilities) and territories) on a infra-communal geographical level (in order to consider the quality of life). This analysis disaggregated according to various groups of individuals or baskets of goods has the aim of highlighting and to characterize the social inequalities on the various territories of an urban area. The work following will thus consist in precisely implementing our methodology (definition of the baskets of goods and typology) in order to return account on a

ground of expertise (Lyon Urban Area, France) the unequal chances in terms of accessibility.

This tool and this methodology then making it possible to return account of criteria of unequal/equal chances between individuals, urban transportation policies/projects assessments would then be seen to provide with tools highlighting debates and decision makers on three dimensions of the sustainable development.

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