

ROAD (NON)-USER EQUITY: A LONG WAY HOME!

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ABSTRACT

The inequality in the distribution of road risk in cities is becoming a real social challenge. Persons with disabilities, children, elderly and people without a car, just to name a few, are more at risk than any other population when it comes to road-related injury and death. This paper has three objectives: to review the concepts of equity and social exclusion under a transportation perspective; to recall inequities related to road risk on the life of vulnerable road users; and to examine how two regional transportation plans (Paris and Montreal) integrated equity concerns in their vision and intended actions. A final discussion will relate those empirical examples to our conceptual model of equity in transport.

Keywords: equity, pedestrians, social exclusion, urban transportation

INTRODUCTION

The inequality in the distribution of road risk in cities is becoming a real social challenge. Persons with disabilities, children, elderly and people without a car, just to name a few, are more at risk than any other population when it comes to road-related injury and death. In some places, these people experience real spatial marginalisation, which also contribute to social exclusion. The objective of this paper is to compare the situation of those populations at risk in France (Paris) and Canada (Montreal) under the issue of equity. After a review of the literature on the concepts of equity and social exclusion under a transportation perspective, two major questions will be addressed: the consequences of inequities related to road risk on the life of vulnerable road users and the integration of equity concerns in released Transportation Plan for these two cities (2008 for Montreal and 2012 for Paris).

EQUITY, SOCIAL EXCLUSION AND TRANSPORTATION

The notion of equity and fairness do not have any universally accepted definitions, and the empirical work related to those definitions is limited, although present for some transportation issues (ex.: infrastructure impacts) (Kirat and Levratto 2008; Elvik 2009; Preston 2009). The actual provision of road safety is based on economic welfare theory promoting efficiency, a paradigm that views the social value of (public) transport too narrowly and that is too often in conflict with equity (Stanley 2007). As Levinson (2002, p. 179) commented:

“Transportation engineers are taught to provide the safe and efficient movement of people and goods. They are not taught to ensure that transportation systems are equitable, in part because of the ambiguity associated with equity.”

Accordingly, many authors agreed now to the need for a different approach when planning transportation systems if we want to achieve better level of equity, especially in road safety (Nantulya, Sleet et al. 2003; Elvik 2009). Such approach could be based on two ideas brought up by Talen (1998) in an interesting paper on equity maps. The first one, named *equality of opportunity*, refers to the fact that everyone should receive the same public benefit regardless of his or her socioeconomic status or willingness or ability to pay. It implies that the distribution of resources should be proportional to the distribution of the population or the number of households in the territory (Apparicio and Séguin 2006). The second conception of equity that is necessary to achieve fairness is tied to a distribution of public benefits which is based on the notion of *need*. For example, the most at risk neighbourhoods should have the best supply of road safety measures. Unfortunately, the “needs-gap”, as Currie (2010) named it in his empirical study of the public transport provision in Melbourne, Australia, amplifies the marginalisation of the socio-economically disadvantaged people. Such “needs-gap” approach would be just as relevant for pedestrian safety as it is for public transit.

The concept of social exclusion seems to be more comprehensive than the previous one, at least in the transport research field. While poverty is viewed as the lack of financial resources to meet basic needs of an individual or household (food, shelter), social exclusion would rather refer to existing barriers which make it difficult for people to participate fully in society (Stanley and Vella-Brodrick 2009). Even if poverty and social exclusion are closely entangled, the latter has been used to facilitate the understanding of this specific dimension of poverty: such barriers may include lack of employment, suitable and affordable housing or access to education and health care (both financially and spatially). A recent workshop on social exclusion gave the opportunity to several scholars to debate on the implications of this concept in the transportation field (Stanley and Lucas 2008). While United Kingdom research has largely focused on *accessibility planning* (to get to essential services: education, employment, health), other researchers looked at the *mobility* of marginalised population (elderly, people with a disability, etc.) and at the different *social policies and programs* aimed at improving the mobility of socially excluded people (Alsnih and Hensher 2003; Diaz Olvera, Mignot et al. 2004; Hine 2004).

The vast body of literature in transportation makes it uneasy to simplify this term and its relationship to the two previous concepts. Essentially, transportation means to get from point A to point B, and could take different forms, from the private car to the widespread transit system. In addition to this simple definition, the French legislation set the scene for a right to transportation¹: under this principle, transportation is a fundamental right for users, and the planning of transport system should be seen as an opportunity to encourage solidarity and to be inclusive of all the populations, particularly the ones without access to a private car.

Derived from those ideas, the right to *mobility* is considered as part of the urban life: mobility is needed to reach resources (housing, health care, education) and, in that sense, it is essential to social equity (Ascher and Apel-Muller 2007). Accordingly, Kaufmann (2008) suggests a concept called *motility*. The balance between accessibility (transportation opportunities: transit or not) and individual skills (how to use the transportation offer) within the appropriation of the transportation system is considered as the potential *motility* of each person. Since people would have different potentials, gaps in motility represent also a source of inequalities (Le Breton 2005).

Starting from these definitions, our conceptualisation of the relationship between equity (or the lack of: inequity), social exclusion and transportation can be seen on Figure 1. While the link between social exclusion and transportation depends on the distance to travel and the potential access to any mode of transportation, the relation between transportation and equity refers to the universal availability of these modes both spatially and temporally, and especially for the public transit mode. This implies that where (transportation) inequities persist, it exacerbates social exclusion and poverty both at the individual and at the society level. The relevance of this trilogy for public policy makers is what might explain the growing interest for such researches: the examination of transport infrastructures and related mobility patterns is useful to understand how it contributes to engender and reinforce social exclusion of already marginalised people (Cass, Shove et al. 2005).

¹ Here, we are thinking about the LOTI law (*Loi d'orientation des transports intérieurs*), voted in 1982.

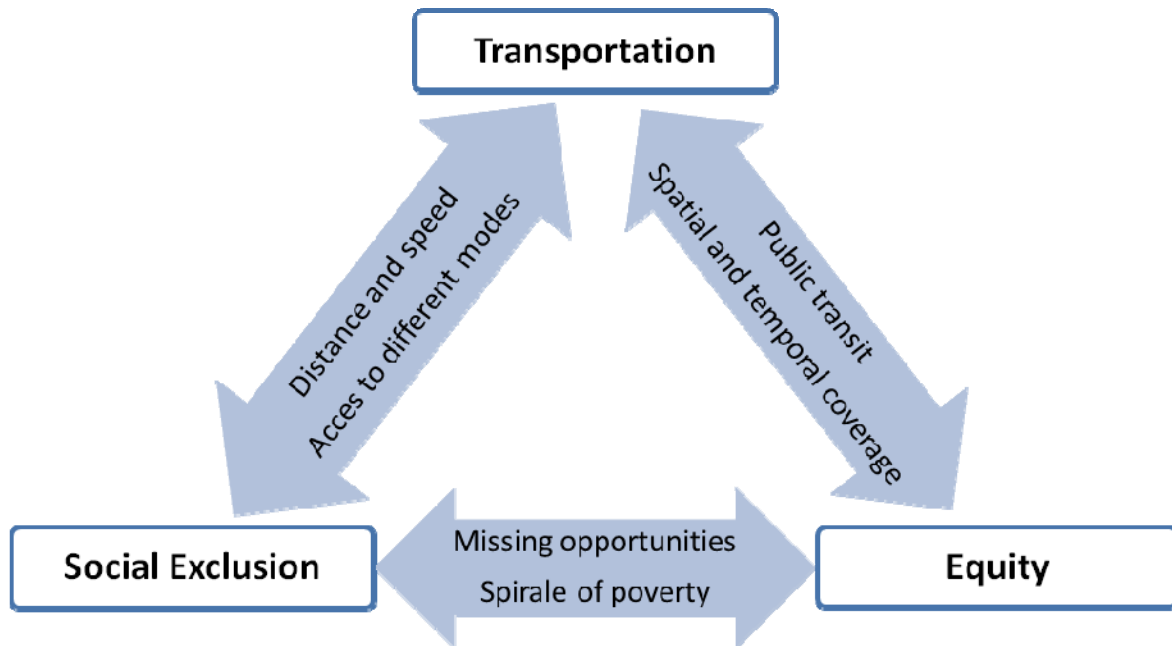


Figure 1 – Conceptualisation of the relation between transportation, equity and social exclusion

Starting from this conceptualisation of equity and exclusion in transport, there is a need for a better integration of citizens' needs at every level of public transport policy (strategic, tactical and operational) (Stanley and Lucas 2008). Accordingly, the planning of urban transportation network including efficient public transit is an opportunity to merge social, environmental and economical goals, offering to people the capacity to fulfil their employment potentials and their personal wellbeing while contributing at the same time to reduce the car use.

Nonetheless, in addition to the time and space constraints that people might experience when trying to move from point A to point B, the risk of injury caused by road accidents is just as much important. In fact, the association between mobility and safety has been recognized for a long time. This relationship is quite simple, as Andrey (2000) mentioned: "In simplest terms, without mobility there would be no accidents; as mobility increases, accident involvements increase, and, as mobility decreases, incidents decrease". But how this rather important component of transportation, *road risk*, is translated in terms of social exclusion and equity? So far, there is little reference to this association in the emerging field of transportation social policy. The following section is an attempt to put forward several thoughts on this topic using the example of vulnerable road users.

VULNERABLE ROAD USERS IN CITIES: VICTIMS OF INEQUITIES?

In Canada, road accidents account for approximately one fifth of a million injured persons and 3,000 deaths each year. Trend data indicate that, while accident rates per unit of travel have declined over the past 25 years, largely due to improved engineering, education, enforcement and medicine, casualty levels and monetary costs remain high largely because of the (automobile) mobility imperative (Andrey 2000; World Health Organisation 2009).

Starting from this rather pessimistic view of road safety, the focus of this section will be on vulnerable road users and more specifically urban pedestrians. Although all types of road user are at risk of being injured or killed in a road traffic crash, there are notable differences in fatality rates between different road user groups. Without a passenger compartment (i.e. a “shell”) to protect them, the (health) consequences of a collision involving a vulnerable road user (pedestrian, cyclist, two-wheeler user) are always more severe, and happened often in cities, where the interactions between all those users is higher. For example, while the island of Montreal represents only a quarter of the population of the province of Quebec, almost half of all the pedestrian accidents occurred on its territory (Thouez, Bourbeau et al. 2003; Direction de santé publique 2006). Again, the last World Health Organisation (WHO) *Global Statut Report on Road Safety* estimated the number of vulnerable road users victims, including pedestrians, cyclists, two and three-wheelers, to represent almost half of the global road traffic deaths, with a substantial inequity toward low-income countries (WHO, 2009). This statistics is better off in Canada, where this group represent only 23% of all deaths, but far worse in the Paris region, where 60% of road accident deaths involve pedestrians and two-wheelers drivers (Direction Régionale de l'Équipement Île-de-France (DREIF) 2004).

Even if the danger and the consequences are enormous, vulnerable road users are still too often regarded as marginal users of the road system, and are therefore not properly considered in land use and road construction planning, especially in urban settings (WHO, 2004). A first application of equity principles can be seen here with the example of pedestrians: both their *needs* and the *opportunities* for them to get from point A to point B safely are not considered equally by road system planners since choices of infrastructures are mostly driven by the need for cars to move (fast!). When considering what Tolley and Turton (1995, cited in Andrey 2000) underlined a few years ago, we can see the need for a better inclusion of equity principle in transportation planning. In reality, every types of road users are driven (and drive!) by the same forces:

“accidents are ‘space-time events’, collisions between vehicles and people going to various destinations at various times in order to meet some need that could not be satisfied at the places where the journeys started (p. 392)”.

Under an equity perspective, we could add to this statement that accidents are not randomly distributed in such a space-time continuum. And who is paying for this uneven social and spatial distribution of road risk, particularly in cities? Among others, *poor people, children, elderly...*

Indeed, research centered on pedestrians, including children point out to socio-economically disadvantaged areas as 'spots' of higher accident risk (Dougherty, Pless et al. 1990; Hasselberg, Laflamme et al. 2001; Graham, Glaister et al. 2005; Cloutier, Apparicio et al. 2007) and link higher levels of traffic and higher residential density to greater numbers of victims (Braddock, Lapidus et al. 1994; Roberts, Norton et al. 1995; LaScala, Gruenewald et al. 2004; Clifton and Kreamer-Fults 2007). These two last risk factors are well known to be spatially related to urban poor neighbourhoods, which make the situation of (child) pedestrians even worse in terms of road safety. In fact, road traffic injuries as a cause of mortality have the steepest social class gradient, particularly in the case of children and young adults (WHO, 2004). The key to understand these interrelations lies in the exposure of poor population to traffic: their car ownership is usually lower than average, consequently, walking is a major form of transport, often combined with public transit (Hine 2004). That being said, how the actual road system planning can take into account equity principles, especially for vulnerable road users in urban settings? This is what will be explored in the following section, under the general analysis of two transportation master plans: Île-de-France (Paris, France) and Montréal (Canada).

TRANSPORTATION MASTER PLAN: PLANNING TO RECONCILIATE CITIZEN AND ROADS

The Île-de-France (Paris region) Transportation Master Plan

French *Plans de Déplacement Urbain* (PDU : Urban Trip-Generation Plans) are embedded in several laws since 1982. The broad idea under such plans, which are mandatory for cities of more than 100 000 inhabitants since 1996, is to define a set of specific "rules" helping to organise the network transporting people and goods, and to manage traffic and parking according to the needs and demands of the urban perimeter included in the plan. There are three majors objective for each PDU:

- Reduce traffic according to different zones within the perimeter;
- Increase the share of public transit in the total amount of trip for the agglomeration;
- Support walking and cycling as the only way to get around the city.

The first PDU for Île-de-France (PDUIF) was undertaken in 2000 by the government, with local partners (City of Paris, local transportation authority, etc.). With 11 million people, the Paris region represented a unique example: This first PDU set the scene for a new era in transportation since it included a clear determination to end up the automobile domination in the region. However, this first PDU, evaluated in 2007, had several flaws that limited its application: too many actions were included in the plan with little details on how and when they should be taken, as well as the difficulty to find which actors would be in charge (and pay!) for those actions (local levels especially were not enough considered in the plan). Starting from this first experience, a new PDU is planned to be released in 2012 (final

version), but the major orientations have been part of a vast public consultation since 2009 (PDUIF 2000).

In the Diagnosis and Orientation Report released in 2009, social and territorial equity are considered as two of the major axis guaranteeing sustainable transportation development in the Île-de-France metropolis (Table I). In fact, one of the major issues in this new PDU is to “assure the mobility of all the Île-de-France inhabitants (*franciliens*)” according to the territorial equity principle. This target is based on two specific populations: people with reduced mobility (physically impaired) and people with low socio-economic status (deprived economically). This last population at risk of transport inequality is fairly numerous in the territory: half of the *francilien* lives under the poverty line, among the poorest 20% of them, 57% do not have access to a private car and one million inhabitants of this region are eligible to public transit low-fares programs (STIF 2009).

Table I: Major challenges to attain sustainable development in transportation

Sustainable development of the system		
<i>Answer Mobility Needs</i>	<i>Preserve the Environment</i>	<i>Guarantee the Financing</i>
Social Equity	Road Safety	Search for Efficiency
Territorial Equity	Pollution, GHG, Noise	Identify Sources of Financing
Economic Attractiveness	Control the Energy Consumption Reduce the Fuel Dependency	

Source: STIF 2009

So far, this Île-de-France PDU suggests several actions in order to reach a better equity, both social and territorial:

- Urban densification around existing public transit nodes;
- Redistribution of buses lines according to actual needs, especially in periurban regions (*banlieues éloignées*);
- A follow-up on public transit low-fares programs;
- Better sharing of the street and public places in favour of people using active mode of transportation such as walking and cycling (i.e. vulnerable users);
- Improvement of the public road network for better safety through speed reduction, *Code de la rue*², and other local and regional initiatives.
- Improvement of the accessibility to public road network and transit throughout the territory.

Nevertheless, these general statements are not enough to substantially reduce social and territorial equity in such a broad region. For example, a recent study by the Paris Chamber of Commerce found that 75% of the territory of all the economic activities zones around Paris is located at more than 800 meters from a train/metro station (STIF 2009). While both these inequities (social and territorial) can be related to a weak access to transportation

² This initiative, first launched by the city of Paris in 1994 includes several measures aimed at reversing the tendency toward car-driven urban design: larger sidewalks, reduced speed, Precaution principle toward vulnerable road users, etc.

alternatives to the automobile and an uneven spatial distribution of road risk, their reduction should pass by the real implementation of actions related to all the above mentioned themes. The final version of this plan, to be released in 2012, will tell us if the major shift taken in 2000 is still on.

The Montreal Transportation Plan (2008)

The idea of a first Transportation Plan was brought up after the Montreal Summit in 2002, where a common vision of the future of Montreal, the Quebec metropolis, was discussed by key partners, transportation stakeholders and the public (City of Montreal 2008). The actual plan, in implementation since 2008, is the result of three elaboration phases that began in 2002: The *Vision* phase ended in 2004 with the definition of the broad orientations; the *Portrait and Assessment*, released in 2005, served to define Montreal's actual transportation systems, its strength and weaknesses; and the last phase included a vast public consultation on the *Plan's Working Paper* that led to the *Plan's Adoption* at the end of 2007. As in the case of Île-de-France, the vision undertaken is calling for a major change in travel habits and behaviours, as stated in the plan's commitment toward four major issues:

- The reduction of car use;
- The development and promotion of alternatives to the car such as public transit and active form of transport (walking, cycling);
- The priority given to transportation safety;
- The confinement of urban sprawl through the strengthening of existing centres.

Contrary to the *PDUIDF*, the issue of equity is not properly set as a priority in the Montreal Plan, but two major orientations (on a total of five) are indirectly addressing this issue: *public transit and active transportation* and *safe travel and quality of life* (Table 2). In fact, the term "social equity" is directly referred to in the emphasis given to public transit (City of Montreal 2008): "By emphasizing public transit, Montréal has opted for serving the largest possible number of residents, thus subscribing to the principle of social equity, and of giving Montréalers access to their homes, jobs, studies and recreational activities (p.34)." Apart from this quote, none of the chapters directly quoted the social, neither territorial equity principle.

Table II: Major strategic orientation to reach the Montreal Transportation Plan Vision

Public Transit and Active Transportation	Road system and parking	Safe Travel and Quality of Life	Montreal Economic Development	Innovation
Provide better public transit	Improve road infrastructure	Adapt the street design	Support the shipment of freight	Better management of all the networks (public transit, streets)
Promote active mode of transportation (walking, cycling)	Reduction of the reliance on cars through parking policy	Create Green Neighbourhoods		
Promote the collective use of the car		Change behaviours of road users		

Source: City of Montreal 2008

Contrary to the Île-de-France plan, Montreal has set several specific measures intended to improve numerous aspects of the transportation system. The situation of vulnerable road users in terms of equity of *opportunities* and *needs* is indirectly part of more than one measures proposed in this plan, as two of them are presented here:

- The implementation of the pedestrian charter, which sets the rules for mandatory *local action plans* specific to the situation of pedestrian in the street network (ex: planning of new infrastructures; safety improvements on road network around schools and health institutions; production of a guide for the development of pedestrians facilities);
- The promotion of universal access as a system-wide concept: under such principle, all individuals, including those with functional limitations, should be able to make use of buildings, urban spaces, programs, services and communications (ex: tailoring the bus service to specific rider groups: *Between Stops* at night for women; change interior design to accommodate families; setting up lines around senior's residence; making all lines wheelchair accessible).

CONCLUSION

One of the social challenges in urban transport is the right for transport. In France, this concept was first seen in the Loi d'Orientation des Transports Intérieurs (LOTI) in the early 1980s. The objective was then to make sure that all citizens had a minimum level of accessibility to different services of the city within a restricted perimeter, the one defined by the urban transportation network. If we want to achieve sustainable transport, there is a need to follow principles that guarantee equity both in terms of territory and society. A transportation network that covers all the different parts of the city, including the periphery, is needed to reduce inequities, especially for people that have to live on the fringe of cities for financial reasons. Most importantly, those socio-economically challenged people have often

atypical transportation schedule and destination, leaving little choices but the use of the car in many cases. With the announced rise in gas price (already on!), transportation cost might just as well reinforce social exclusion through the impoverishment of an already economically fragile portion of the population: facing new expenses, families might have to decrease their mobility.

In addition to this problem of spatial accessibility, another social challenge faced by many is the inequality in the distribution of road risk within the transportation network. In many countries, the absence of a voice for the most vulnerable groups has meant that the safety of pedestrians and cyclists is often disregarded in favour of motorized travel although equal protection for all road users should be a guiding rule. This issue of equity is a central one for reducing the global burden of road crash death and injury (WHO 2004). Persons with disabilities, children, elderly, people without a car and moped drivers, just to name a few, are more at risk than any other population when it comes to road-related injury and death. In some places, these people experience real spatial marginalisation, which also contribute to social exclusion.

When evaluating the two example of transportation plan under our theoretical framework, it seems that planning could be a way out toward better equity in transport. Indeed, both plans have orientations, and even specific measures to change distance traveled and traffic speed; improve the public transit spatial and temporal coverage; and give safe access to active modes of transport. However, the real challenge for those plans is coming now: to implement the suggested measures in order to realise the needed shift in paradigm from car-driven society to liveable communities.

REFERENCES

- Alsnih, R. and D. A. Hensher (2003). The mobility and accessibility expectations of seniors in an aging population. *Transportation Research Part A: Policy and Practice* 37, 903-916.
- Andrey, J. (2000). The automobile imperative: Risks of mobility and mobility-related risks. *Canadian Geographer* 44, 387-400.
- Apparicio, P. and A.-M. Séguin (2006). Measuring the accessibility of services and facilities for residents of public housing in Montréal. *Urban Studies* 43, 187-211.
- Ascher, F. and M. Apel-Muller, (2007). *La rue est à nous... tous.* Au Diable Vauvert, Paris.
- Braddock, M., G. Lapidus, et al. (1994). Using a geographic information system to understand child pedestrian injury. *American Journal of Public Health* 84, 1158-1161.
- Cass, N., E. Shove, et al. (2005). Social exclusion, mobility and access. *Sociological Review* 53, 539-555.
- City of Montreal (2008). *Transportation Plan.* Montréal: 220 p.
- Clifton, K. J. and K. Kreamer-Fults (2007). An examination of the environmental attributes associated with pedestrian-vehicular crashes near public schools. *Accident Analysis & Prevention* 39, 708-715.
- Cloutier, M. S., P. Apparicio, et al. (2007). GIS-based spatial analysis of child pedestrian accidents near primary schools in Montréal, Canada. *Applied GIS* 3, 1-30.
- Currie, G. (2010). Quantifying spatial gaps in public transport supply based on social needs. *Journal of Transport Geography* 18, 31-41.

- Diaz Olvera, L., D. Mignot, et al. (2004). Daily mobility and inequality: The situation of the poor. *Built Environment* 30, 153-160.
- Direction de santé publique (2006). Le transport urbain, une question de santé. Rapport annuel 2006 sur la santé de la population montréalaise. Montréal, Agence de la santé et des services sociaux de Montréal.
- Direction Régionale de l'Équipement Île-de-France (DREIF) (2004). Les déplacements des franciliens en 2001-2002: Synthèse de l'enquête globale de transport. Paris: 45.
- Dougherty, G., I. B. Pless, et al. (1990). Social class and the occurrence of traffic injuries and deaths in urban children. *Canadian Journal of Public Health* 81, 204-209.
- Elvik, R. (2009). The trade-off between efficiency and equity in road safety policy. *Safety Science* 47, 817-825.
- Graham, D., S. Glaister, et al. (2005). The effects of area deprivation on the incidence of child and adult pedestrian casualties in England. *Accident Analysis & Prevention* 37, 125-135.
- Hasselberg, M., L. Laflamme, et al. (2001). Socioeconomic differences in road traffic injuries during childhood and youth: A closer look at different kinds of road user. *Journal of Epidemiology & Community Health* 55, 858-862.
- Hine, J. (2004). Transport disadvantage and social exclusion in urban Scotland. *Built Environment* 30, 161-171.
- Kaufmann, V. (2008). Les paradoxes de la mobilité – Bouger, s'enraciner. Presses Polytechniques et Universitaires Romandes, Lausanne.
- Kirat, T. and N. Levratto (2008). Transportation systems damages, economic rationality and social justice. Are all the economic agents equal? Tous égaux face aux nuisances des infrastructures de transport? le calcul économique et le droit administratif au défi de l'équité 10, 349-364.
- LaScala, E. A., P. J. Gruenewald, et al. (2004). An ecological study of the locations of schools and child pedestrian injury collisions. *Accident Analysis & Prevention* 36, 569-576.
- Le Breton, É. (2005). Bouger pour s'en sortir: mobilité quotidienne et intégration sociale. Armand Colin, Paris.
- Levinson, D. (2002). Identifying winners and losers in transportation. *Transportation Research Record* 1812, 179-185.
- Nantulya, V. M., D. A. Sleet, et al. (2003). Introduction: the global challenge of road traffic injuries: can we achieve equity in safety? *Injury control and safety promotion* 10, 3-7.
- PDUIF (2000). Plan de déplacements urbains de la région Île-de-France. Paris: 121 p.
- Preston, J. (2009). Epilogue: Transport policy and social exclusion-Some reflections. *Transport Policy* 16, 140-142.
- Roberts, I., R. Norton, et al. (1995). Effect of environmental factors on risk of injury of child pedestrians by motor vehicles: A case-control study. *BMJ* 310, 91-94.
- Stanley, J. (2007). Public transport and social policy goals. *Road and Transport Research* 16, 20-30.
- Stanley, J. and K. Lucas (2008). Social exclusion: What can public transport offer? *Research in Transportation Economics* 22, 36-40.
- Stanley, J. and D. Vella-Brodick (2009). The usefulness of social exclusion to inform social policy in transport. *Transport Policy* 16, 90-96.
- STIF (2009). Diagnostic et orientation pour le nouveau Plan de déplacements urbains d'Île-de-France. Paris: 108 p.
- Talen, E. (1998). Visualizing Fairness: Equity Maps for Planners. *American Planning Association Journal* 64, 22-38.
- Thouez, J. P., R. Bourbeau, et al. (2003). Piétons victimes d'un accident de la route en milieu urbain et rural au Québec et en Ontario, 1995-1997. *Revue Canadienne des Sciences Régionales* 26, 191-203.
- World Health Organisation (2004). World report on road traffic injury prevention. Geneva, WHO: 178 p.

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World Health Organisation (2009). Global statut report on road safety: Time for action.
Geneva, WHO: 301 p.