# TRANSPORT DISADVANTAGE IN PRACTICE; GEOGRAPHICAL PERSPECTIVES

## 1 Introduction

This is the first of two chapters on involuntary transport disadvantages in practice. In both chapters narratives on involuntary transport disadvantages will be presented. These narratives are to be found in the literature, academic and grey literature alike. In this chapter the focus will be on the description of situations of transport disadvantage from a geographical viewpoint. I will describe what happens with transport and mobility in cities (2), in suburbs and peri- urban areas (3), and in rural areas (4). The focus will be on the OECD world, but for cities and rural areas short paragraphs on situations in developing countries are included.

## 2 Transport disadvantages in urban areas

Where should involuntary transport disadvantage in urban areas be situated? To start, one could argue that in urban areas transport disadvantages will not be very manifest, as dense public transport networks are available. But the literature and practices from real life sometimes show otherwise. There is involuntary transport disadvantage in cities and urban areas. Partly this arises from the characteristics of the public transport systems (pricing, timetabling, routing), and partly from the urban forms of cities.

I will first present a general overview on transport disadvantage in cities, and then focus on two narratives on specific cities. We look at cities in the OECD world, and at cities in the less developed parts of our world.

### 2.1 General overview

The relationship between urban form, built environment, and travel behaviour is one of the most studied themes in transport research and urban planning. However, this has until now not resulted in clear conclusions and “take away’s”. But a rule of thumb is that when population density is lower, the percentage of non- motorised households is smaller, and also more concentrated among the more marginal social groups (Matteoli, Colleoni, 2016). Stated the other way around: more non- car households can be found in higher density cities. For our perspective the form of cities is also important.

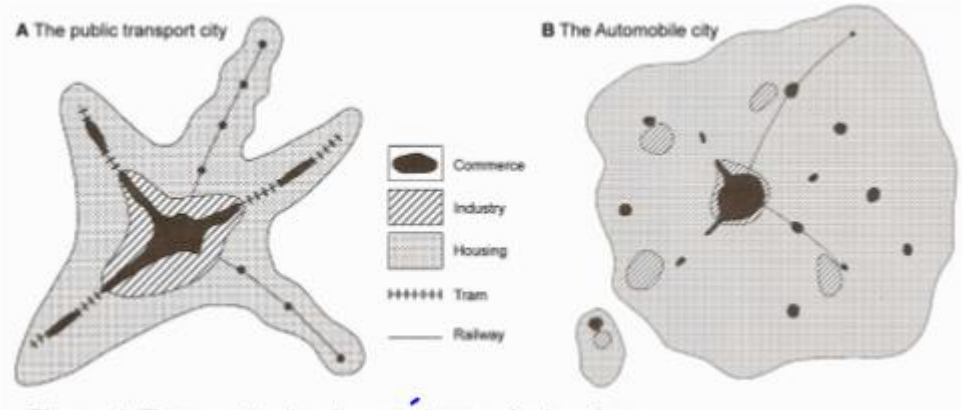



**Figure 1** Transport technology and eras of urban form
(*Source*: Forster 2004, p.20)

Cities defined by rail systems often still have traces as in A, where cities defined in the period of car dominance have most traces of B. There is also an other division useful to make, related to the residential location of different urban socio- economic classes (Kestesloot,2005).

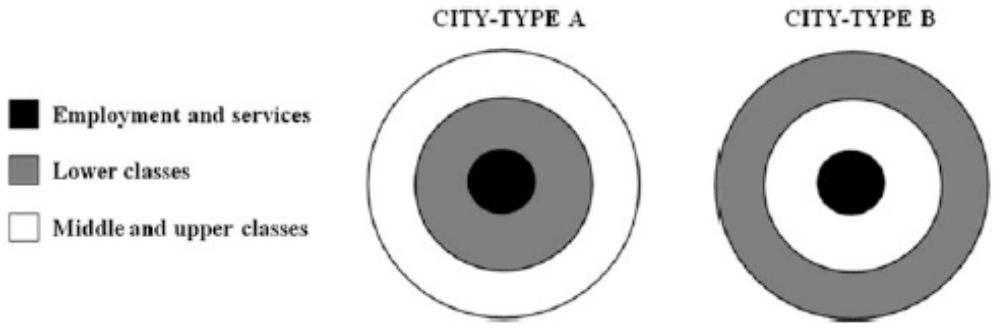



Fig. 3 Ideal-typical urban socio-spatial configurations for European cities. *Source* Adapted from Kesteloot (2005)

City type A is called the dramatic city. Employment, services and lower classes of society are concentrated in the urban core, middle classes live in the suburbs. City type B is called the Topologic city. Here the middle and upper classes live in the urban core, and the poor are concentrate in the suburbs. Examples of type A are many British or German cities, examples of type B are most Australian cities, but for example also many French cities, as Weglinski et Korsu (2013) explain. French cities are often rather rich in their centres with expensive apartments and high qualified employment, while the poorer households live in the suburbs, *les banlieus.*

Transport disadvantage is a neutral concept. Also households with cars can face transport disadvantage, often by their own choice. Involuntary transport disadvantage is at stake when transport is burdensome, but not by free will. In cities often transport will not be real burdensome, as public transport is available. In this paragraph I will focus on situations where for specific households and individuals transport can be difficult even in cities. For example, in cities of type B transport disadvantage of urban poorer households could easier be at stake than in cities of type A, as densities for delivering appropriate public transport are lower. As Mattioli and Correoni (2016) write; "*in city type A the consequences of low car ownership among the city-centre poor are mitigated by better accessibility*". One caveat should be raised here already; it will not be easy for the households that depend for their transport more or less completely on public transport and walking to move out of their cities to other locations for meeting friends, family, or for leisure. They look somewhat trapped in their cities, as has been shown in the Netherlands for urban minority groups (Harms,2006).

In an overview article also Stetzer (2016) concludes that the lowest mobility related discrimination could be found in an environment with good public transport supply, high density, and short travel distances, in combination with an ample choice of activities, and that these features are most likely to be found in urban areas. Many poorer households prefer living in the city, at locations with these characteristics. And in higher density cities of type A most poorer households can live in cities rather easily , at least at daytime, without cars.

This situation is more difficult to reach in cities of type B, as entrance to cheaper housing in areas with the greatest delivery of public transport is probably somewhat blocked by concentrations of richer households. And another important element is whether the public transport is indeed helpful in overcoming potential transport disadvantage. This is a function of the design of the public transport system. Pricing is important here, as is routing and time scheduling (see 5.3 on this theme). Many non

- motorised households in cities can have great transport problems at times when there is no public transport delivery, mostly later in the evening, at nights, and at Sundays. And in a number of cities the design of the public transport system leads to rather high levels of transport disadvantage, especially for households living in less density neighbourhoods.

Lower income groups often prefer inner-city locations (Gleaser, Kahn and Rappaport, 2008, Seils and, Meyer, 2012), although the extent to which people base their residential decisions on transport arguments may be limited (Naess, 2009). From another perspective, the influence of residential location on car ownership, as studied in Copenhagen (Naess, 2012) was considerable, and probably "*as least as strong as the influence of car ownership on residential location".* A specific and joint culture among the poorer urban households and the other urban households could arise as "*inner-city residents traveling mainly by public or nonmotorized modes while being exposed to nuisances from traffic originating mostly from the suburbs are likely to develop less car friendly attitudes than suburbanites who regard the car as a necessity in order to reach the daily activities"* (Naess, 2009).

Greater distance are travelled by public transport in cities with more jobs per hectare in their core. Cities that have not been able to keep their employment in their centres are clearly more car dependent (van de Coevering and Schwanen, 2006).

## 2.2. Transport disadvantage in the urban worlds of the OECD

In this part I will present narratives from cities in OECD countries. I will start at the country where most research has been done on urban transport disadvantage, Australia. From Oceania I move to Europe, and I will end in North America.

Australia has a high level of car dependence, and most of its bigger cities belong to type B, with many potential transport disadvantaged households and individuals living in the outer more suburban like parts of the urban areas. As we have seen , in the Introduction, in Australia the concept of forced car ownership, and car related economic stress was coined. Most social – economic disadvantaged areas in many Australian cities are located in outer- suburban locations, and as outward expansion occurred, the number of potentially available outer-urban jobs also increased. But the potential match where this situation could lead to is certainly not also found, due to transport reasons. Low- income workers have better job proximity, but low job accessibility. The jobs are there, are even near, but cannot be reached by lack of appropriate transport modes.

Australian cities are among the lowest density cities of the world, and this is seen in Australia as a problem. The cities are in their functioning very vulnerable for changes in fuel prices (Dodson and Sipe, 2007, Fischmann and Brennan, 2010), and are , looking at the goals set on global warming with the Paris Agreement, fiercely unsustainable. And, in contrast to the United States, this state of art raises concern in almost all Australian states and cities.

In Australia the cheapest housing is available at locations where there is a lack in the provision of public transport. This leads to the situation of high car ownership on low income. Many households and individuals pay their way out of transport disadvantage and into car related economic stress (Currie et. al, 2009). But this situation differs somewhat across Australia. Ricciardi, Xia and Currie (2015) conclude that the public transport system of **Perth** is very centrally focussed. Perth has an uneven distribution of public transport, but not as extreme as in Melbourne. And non - car owning households could receive a rather high supply of public transport in Perth, as they seem to have chosen to locate near to public transport services. The difficulty for these households arises when they want to relocate, as most locations will then create problems for them.

Moving to the other coast the work of Li, Dodson and Sipe (2015), done for **Brisbane**, asks attention for the price of public transport. As in many other cities fare prices did rise in the last decade, in Brisbane between 2010 and 2014 with 50 %. Public transport just becomes to expensive for many households and the authors show that remaining on public transport is more expensive than moving to car use, or, better stated the other way around; *"lower socio- economic status households who already face relatively high spatial travel costs would need to absorb large fuel cost increases before it would become cost-effective to shift to public transport, a problem that could be worsened if travel time cost was also included"* . The fact that through policies of public transport managers public transport gets a competitive disadvantage against cars can be seen from sustainability viewpoints as the wrong direction!

Xia et.al (2016) compared the transport situations of Perth and **Sydney**. Perth has a more even distribution on public transport than Sydney, while Sydney is more even in public transport service than Melbourne. And the mode share of public transport is twice as high in Sydney as in Perth (2011; 13,5 %, 6.9%). Also in Sydney non- car households receive a more than equal supply of public transport than the total population. Sydney is better in creating public transport supply in the most outer urban areas than Perth, the result of several policy actions.

Hurni (2005) looked in more detail to transport and social exclusion in Western Sydney. A quarter of the poorest households in this area had no car in the household, while there is very little public transport available, with almost no cross linkages, and very little transport to hospitals. This leads to problematic travel experiences. To present two ; a young mother, pregnant with her second child, had to catch three busses, with a two- year old in tow, to get to the hospital for her weekly check-ups, while the road distance was only 6,5 kilometres. And for sole parents participating in activities such as taking their children to after school sporting or leisure was just "out of the question"!

For the **three greatest cities in New Zealand**, Imran and Pearce (2015) studied their narratives on transport situations. They identified storylines from the respective transport policy and planning documents. Sprawling Auckland is the most car dependent city, with more contained Wellington with a rail infrastructure as its counterpart, and with Christchurch in the intermediate position. The former storylines, for example the stories on providing space for the freedom of the car in Auckland, do create actual path dependencies that form barriers to sustainable transport. The storylines on road building changed in the last 60 years from economic growth to consumer preferences and safety. Transport disadvantage is not an element in the narratives of New Zealand's cities.

Moving from Oceania to Europe a number of changes can be noticed. At first, the level of non- car households in societies increases, from on average 12 % to on average 20 %. The intermediate travel mode of cycling, important in cities in Denmark, the Netherlands and Northern Germany, is introduced. And, even more important, most European cities are older, have historic cores, and did not accept car use to dominate in the complete urban area. But there are certainly also similarities, for example in the restructuring of public transport.

Starting on the British Isles, Church, Frost and Sullivan (2000) presented an early comprehensive study on transport disadvantages in **London**, and found out that none of UK's most unpopular local authority housing estates had a supermarket or a range of shops, whilst no more than five had a post office, a clinic, a chemist, or a launderette, meaning that virtually no services were available, and distances had to be covered by many households. They concluded that social exclusion in London was related to the lack of "connection" between 25 % of the residents and many of the activities and opportunities that are required to participate fully in society. Important in this "disconnection" is the inability to physically access the opportunities because of travel difficulties. And they ended by advising that "*tackling these issues will require a multi – agency approach".*

Lucas, Grosvenor and Simpson (made another connection when they argued that there had been a related decline in public transport patronage, accompanied by a deterioration in frequency, reliability and quality of services. In their report they let the involuntary transport disadvantaged households speak on their travel situations. That created interesting pictures such as the fact that a significant number of households did not want to travel outside their local area, if at all possible: '*many of the people that we spoke felt that it was unreasonable to be expected to travel long distances (more than 20 miles) outside their local area just to take up poorly paid work elsewhere*". The travel horizon (Morris,2006) of these people seems rather small, but we did not know whether potential employers were willing to pay to full public transport travel costs that these people initially have to make. Employers are not urged by governments to consider the ease to reach their premises - often build at highway locations - by public transport.

The last older report comes from **Urban Scotland** (Hine, Mitchell, 2001). Many complaints were noticed especially on lack of information, on safety around waiting at bus stops at night and on servicing on evenings and Sundays. Respondents sometimes felt trapped in their homes, but could not afford the purchase and maintenance of a car.

What probably has not helped is the renewal in public transport in **Belfast**. The public transport network there has been transformed into a Metro service, dominated by high frequency corridors. A rather intensive web of public transport routes was restructured and the researchers (Blair, Hine and Bukhari, 2013) found that many areas where many public transport captives lived, lost their services. The Metro service was created without looking at the activity spaces of these households and individuals.

**Dublin** has a mixed situation as many poorer households without cars live in areas with high unemployment rates, and with high levels of public transport service, whereas especially in relative recent (2001-2007) build housing areas for lower income households, at more peripheral locations, no or only minor public transport is being offered. Here the situation in Melbourne seems reflected (Ahern, Vega, Caulfield, 2016).

Moving to **Rotterdam** I already presented the case in the first chapter (Bastiaansen, 2014). The routing and broader the design of the public transport network, plus the unavailability of transport at nights and early mornings leads to situations, where jobs are there, people are willing to take these jobs, but cannot reach them, at least not with an affordable price and reasonable time investment. Transport poverty thus translates into accessibility poverty in Rotterdam South. Lack of mobility leads to non-functioning of the labour market. However, this problem has not received much attention, as most households adapt in some way or another, by finding a lower classified, or lower paid, job closer to home, by spending long extra working time, by asking permanent rides from colleagues, or by simply not working or not working in the formal sector. There is some equanimity or resignation among the people of Rotterdam South vis-à-vis this problem of mobility mismatch.

In Germany almost no attention is given to transport disadvantages in cities. It is interesting to search for reasons for this state of art. But in 2016 , inspired ,as the authors write, by the lack of adequate mobility equity studies, results from research in **Aachen** was published (Shirmahammaddli, Louen and Valle, 2016). Aachen has an overall fair distribution of public transport delivery, but the relationship of this situation and the needs of the rather small group without cars or without reduction prices for their transport (as students have) remains unclear.

In France, most attention goes to transport disadvantages in suburban, peri urban and rural areas. But Caubel (2012) presented with *Politique de transports et accès à la ville pour tous?* an interesting description of the situation in **Lyon**; "*Les changements de localisation des activités urbaines,*

*exclusivement favorables aux plus aisés, creusent des écarts d'accès avec les habitants des quartiers pauvres, pouvant être qualifiés de perdants, voire pouvant se retrouver en situation d'exclusion de la « norme » de la société précédemment mise en évidence..(*translation ; “Changes in the location of urban activities, exclusively favourable to the wealthiest, widen access gaps with the inhabitants of poor neighbourhoods, who can be described as losers or even be in a situation of exclusion from the "norm" of society”*)*. As often, French authors react more fundamental. In Caubel’s vision there is a conflict between maximising speed and travel times and giving entrance to everybody. In his view, a joint slowdown in the automobile speed with an arbitrage on prices for transport would be a strategy to reduce gaps in the levels of accessibility between population groups.

The research in the United States present only few articles on transport disadvantage in cities in general. Most research is indirect or on the spatial mismatch between housing locations and job locations for specific groups, that will be looked at in 2.2.3. For this paragraph some articles are relevant. The first is situated in the **Dallas- Fort Worth** Metropolitan Area, and discusses representations of everyday travel experiences, as an addendum and correction on the transport modelling that more or less systematically leaves out some population groups and the travel circumstances, by assumptions about household income, access to cars, availability of alternative modes. The author (Nostikasari, 2015) states that transport models still have “ in- built”- tendencies to strengthen the mobility of high mobile groups. To give an example, it is assumed that a household in income quartile 4 (rather high income) makes four times more trips a day than a household in income quartile 1 (low income). Social capital and social networking is important for mitigating transport disadvantages. Farber and Li (2013) studied the influence of urban sprawl on the potential for social interaction in 42 metropolitan areas. Their conclusion was that social interaction potential is hampered by sprawl, and especially decentralised metropoles constrain opportunities for social interaction.

A new perspective on transport disadvantage, created by the design of public transport systems is presented for **Atlanta** by Paget-Seekins (2013). She focusses her research on the stakeholders and actors involved in creating and re-examining public transport (in the U.S. called ; transit) in Atlanta. Five subgroups are identified in delivering input on this issue and their goals vary greatly. Many groups do not want to pay for qualitative good public transport. Atlanta contains some 592.000 auto captives, 14 % of the population, and between 945.000 and 2.506.000 auto-choice persons, who will never choose transit. This is between 37 and 75 % of the population (median 56 %). Atlanta contains 352.000 transit captives, 198.000 transit choice (who rather often use transit but have cars, together 13,5 %. The last group is called the auto potential choice transit people and is rather huge with between 452.000 and 2.013.000 people, between 11 and 49 %, with a median of 30,5 %. But also in the transit coalition different interests can be noted. The environmental and smart growth groups and the equity groups are both pushing for more transit, but with different discourses. Environmental and smart growth groups opt for transit potential choice riders, hoping that many car drivers will find their way to public transport. Equity groups focus on good transit routes for the 13,5 % that really uses transit, but faces many transport disadvantages as only 58 % of jobs and only 39 % of population is within walking distance from transit. An interesting detail is that in the transit coalition the majority was white, whereas in actual transit ridership the majority , 80 %, is non- white!

Paget- Seekins, but also Caubel, bring the world of power into urban and transport planning and transport service delivery. In most academic literature this world is not visited, but power is never far away. A picture arises that in OECD cities public transport could mitigate transport disadvantage, or could even be able to avoid any form of transport disadvantage. However, this asks for appropriate conditions on service times, on timetables, on routing schedules and on fare prices. Many narratives leading to transport disadvantage, even in urban areas, or to car related economic stress originate in

minor delivery, inappropriate routing , inappropriate timing or high fares, all seen from the perspectives of poorer and more vulnerable urban households and individuals (see also 5.5).

## 2.3 Transport disadvantage in OECD urban areas ; some specific problems

### 2.3.1 Spatial Mismatch

In 1968 Kain developed a theory for the United States on the relationship between the Black city population and the jobs available to them. He observed that there was a huge and concentrated unemployment in inner city, black neighbourhoods. And he showed a discontinuity between the locations of the potential workers and their proximity to jobs. Many fitting jobs for them were starting to be found in the suburbs. But as distances to jobs increased, the likelihood of employment for the potential workforce living in the inner cities declined rapidly. It looked like many potential workers could just not reach these jobs. The Spatial Mismatch Hypothesis was developed and argued that *low-skilled minorities residing in US inner cities experience poor labour market conditions, because they are disconnected from suburban job opportunities.*

Following the thinking of Kain, many researchers have tried to test the existence of a causal link between the spatial disconnection of jobs and the adverse labour market results of minorities (Gobillon, Selod and Zenou, 2007). That happened since the nineties. The first twenty years of the existence of the theory it seemed just common wisdom. And indeed, since 1950 a great suburbanisation of jobs took place in the United States. Basically, jobs followed the majority of the labour force, and especially low paying jobs needed lots of space for factories and distribution centres and left the cities for suburbs, where land prices were less expensive. On the other side Blacks mainly remained living in city centres. Suburbs were not opened up for the Black population, and there was a residential inertia to be noted. Access to the suburban jobs for Blacks was poor. Jobs were unreachable, as most Blacks did not own cars, and public transport routes failed to make the connection. From the perspective of the potential workers the costs of commuting were too high in view of the offered wages, job search for suburban jobs was inefficient, and there was a lack in searching intensively for jobs. Looking at the perspective of the employers there seemed territorial discrimination at stake (not researched well, see Gobillon, Selod and Zenou, 2007). And employers considered the productivity of the workers from the city centres too low.

Most studies originating from the Spatial Mismatch Hypothesis stem from the years 1990-2005. The urban poor had to travel to find decent jobs, had to pay rather huge transport costs (and remember, there is little public transport in and to the U.S. suburbs!) and are, when there is no car in the household, unable to reach the work offered and thus remain trapped in a circle of poverty (Sanchez, Stolz and Ma, 2003). Core factors in this spatial mismatch are the high costs for commuting (see Roberto, 2008), long travel times, the loss of jobs in the immediate vicinities of their homes, and the restricted mobility possibilities of poorer households. The affordable homes for poorer households are situated at greater distances from the location of employment for lower skilled workers. Research by Blumenberg and Waller (2003) shows that while on average 8 per cent of American households did not own a car, for households with an income of US$20,000 or less (in 2003) this percentage increased to 33 per cent.In 2003 75% of all Americans on welfare lived in the bigger cities, and more than 60 per cent of all jobs were found in the suburbs.

After 2005, it looks like the theory waned and broadened at the same time. First the waning. There were serious doubts raised on whether there was Spatial Mismatch. Hellerstein, Neumark and McInerney (2008) argued that not spatial mismatch, but Racial Mismatch was the problem. In their vision : "*the problem is not a lack of jobs, per se, where blacks live, but a lack of jobs where black lives into which blacks are hired".* And Grengs (2010) also offers another alternative hypothesis. He studied

the spatial mismatch in Detroit and arrived at the conclusion that the quality of transit in that urban area was below standard; *"the prospects for serving the most disadvantaged people with public transit are so limited that the problem facing poor people in Detroit is a "modal mismatch" instead of a "spatial mismatch".* Some authors draw attention to the specific situation of the Spatial Mismatch theory seen in specific geographical contexts. In most European contexts urban spatial structures are inverted, with many jobs until recently in cities, and minorities living in rather peripheral areas in these cities (Gobillon and Selod, 2013).

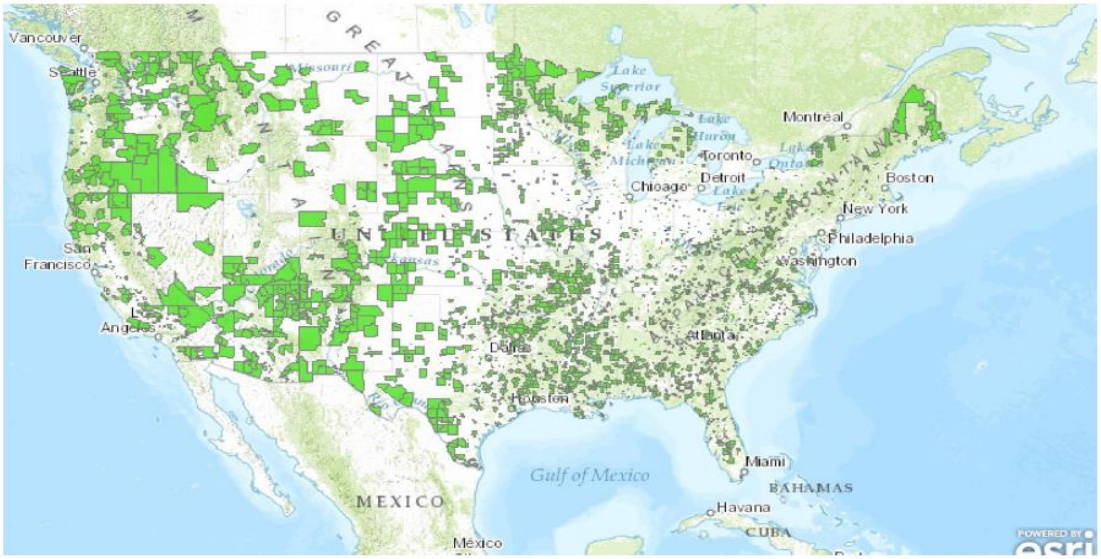
Then the broadening. Chen and Akar (2017) concluded that in Greater Cleveland low- income people (including minorities) were not disadvantaged in access to jobs, as living in urban neighbourhoods increased the accessibility of commercial and industrial jobs, however not to office jobs. Hu (2015) concluded the same for Los Angeles. Inner city poor had greater job accessibility than the suburban poor. However; what happens in these newer studies is the change in focus, from the Black communities to the poorer households in general. Seen from this broader perspective, the theory is less useful, as many poor households have suburbanized. Hu's caveat is that the advantage of living in the inner city for job access will decline with rapid employment suburbanization. Also broader is the focus outside suburbia as the job market. For example Nadeau (2015) did research on low- income commuters facing mobility difficulties in reaching airports.

### 2.3.2. Food Deserts

Food deserts are defined as regions and areas lacking access to healthy foods, like fruits and vegetables, as well as a range of other nutritious options (Widener and Shannon, 2014). Healthy and nutritious food must be geographically close enough to consumers to be useful. The relocation of supermarkets in the United States and in Canada created distances between urban populations and the supply of healthy foods. Larsen and Gilliland (2008) argued that in London, Ontario many people, especially those in lower- income neighbourhoods, had to walk or use transit to get groceries. Coveney and O'Dwyer (2009) noted that low- income households without independent transport in Australia had difficulties reaching food shops. And Freund and Martin (2008) made the connection between the car and the food that we eat, both factors for the increase in obesity. In *Fast cars, Fast food: hyperconsumption and its health and environmental consequences* they showed how both elements fit into daily life; "*possession of a car in the U.S. is a necessity, fast food for time constrained people a reality"*

As most of the food desert literature focusses on urban areas, the Great Plains also are noted as containing many food deserts (Hoflund,2014). Lack of public and private transport options means that Nebraskans who live in food deserts shop at small groceries or convenience stores, that do not offer

**Figure 5. Low-income census tracts where a significant number or share of residents is m than one mile (urban) or 10 miles (rural) from the nearest supermarket**




Source: USDA Food Access Research Atlas, 2010

a rich variety of fresh, healthy foods (Hoflund, 2014). Moving back to the city, Gordon et.al (2011) noted that in New York City the locations of food deserts corresponded to the areas with the highest proportions of Black residents and the lowest median household income. And an inventarisation in Winnipeg of "unsupportive food environments" located many of these environments also outside the poorest neighbourhoods (Wiebe, Distatio, 2016). In general, for 2010 the USDA (U.S. Department of Agriculture,2010) estimated that more than 23,5 million people (this was 7,6 % of the total population) lived in food deserts (Hoflund, 2014).

But also here, as with the Spatial Mismatch Hypothesis, is serious doubt on the usefulness and the reliability of the Food Desert Frame. Bitler and Haiden (2011) concluded in an overview that, although much progress was made in *identifying* food deserts, very little progress was made on *understanding* why food deserts exist. Wright et. al (2016) elaborated on this same issue arguing that there are as many deprived areas being no food deserts as being one. Yes, Wright et.al (2016) stated that most food deserts are in deprived neighbourhoods, but "*correlation is not a cause*". And in Regina and Saskatoon, two Canadian cities, Wang et.al (2016) found that a rather strange combination of single parent households, senior populations, higher educated populations and minority groups tended to have greater access to supermarkets and grocery stores. In Amsterdam, no pronounced inequalities in access to healthy food could be confirmed (Helbich et.al, 2017).

So what could be an explanation for food deserts? Wright et.al (2016) move here from the supply side to the demand side, discussing the question why poorer households are under- nourished. The authors conclude that culture is at stake, plus the fact that healthier food is more expensive than less healthy food by (at least in the U.S.) a significant amount; "*most poor people seek out foods with the most energy density at the lowest cost, and those are foods higher in sugar and fat*". In this respect, Ghosh-Dastidar et.al (2017) reported from an experiment of opening and healthy supermarket in a food desert and noted that this opening caused little improvement in net consumption of healthy food. All-in all, there are food deserts, and it seems a useful statistical category. But explaining why food deserts are there has not only to do with supermarket restructuring and difficult mobility situations, but also with culture and choices of the households and individuals living in these food deserts.

### 2.3.3. Gentrification, housing and transport disadvantage

Some urban neighbourhoods where many poorer households live are being gentrified or revitalized. This means that more prosperous households buy houses and start developing new housing and even new area qualities. But this positive development can come with a cost. Tighe and Ganning (2016) explain that for example in weak housing market cities such as Buffalo or Saint Louis - often also shrinking in population - gentrification and revitalization can create a loss in affordable housing. In their words: ïndividual neighbourhoods may be experiencing gentrification in terms of increasing housing costs, constrained housing supply and potential displacement of the poor.

Two routes are possible here. When the poorer households stay, Tighe and Ganning (2016) show that less affordable housing can be compensated by advantages in transport affordability, as higher densities of richer urban households create better public transit services. Poorer households could also decide to leave, as a reaction to new market forces. There is just a small amount of good inexpensive houses, so households need to search for other inexpensive houses. These houses are often situated at locations with greater distances from jobs, amenities and shops. And (Martin and Goodman, 2016)': "*places that provide access to fewer resources – such as employment, education, services, public transport – are locations that disadvantage their residents* ". Spiller (2014) found that - with a 30 minute drive or a 45 minutes in public transport- a resident from a fringe suburb in Melbourne could reach just 16 % of the total metropolitan jobs by car, compared with 41 % for residents in inner suburbs and that only 0,2 % of these jobs could be reached by public transport from the fringe suburb compared to 33 % for the inner city resident. Thus, whereas housing costs remain low, transport cost for these poorer households tend to increase.

Billingham (2017) presents the case of Wichita, Kansas. Here central area renters were confronted with gentrification. Active displacement of renters is absent, but displacement occurs indirectly. Interesting is the perspective on this displacement to "ascending" areas, with less public transport. Some researchers see it as real displacement, while other see it as just the appropriate working of markets! And Mattingly and Morrissey (2014) clarified for Auckland that the more remote areas where former urban neighbourhood households move to often exhibit heavy car dependence, which could lead to car purchase and potential car related economic stress. The plea is for housing researchers to include also changing transport expenditures in their analyses of housing markets. The process is, in one sentence (Vidyattama, Tanton, Nepal, 2011): *"high costs of housing in cities may mean that households on low to moderate incomes move to city outskirts to avoid housing stress; however this may be a false economy as transport costs for these households will be higher* "


Moving to Europe, for London Cao and Hickman (2016) noted that newcomers are buying small houses for very high prices, pushing out the low- income households to less desirable areas, where housing is still affordable, but where public transport has far fewer services. Thus, car dependence (and vulnerability) grows as an indirect result of gentrification.

And for Amsterdam and Rotterdam in the Netherlands Hochstenbach and Musterd (2017) presented the result that with a gentrification of city neighbourhoods suburbanization of poverty can take place. Also, an immediate move from low- income households from elsewhere into the inexpensive suburbs can take place, as these households know they are no longer able to acquire inexpensive housing in the real urban area.

Most evidence leads to the conclusion that transport affordability is important in cities. Glaeser, Kahn and Rappaport (2008) asked themselves; *Why do the poor live in cities*?, and arrived at the conclusion that a greater part of the answer could be found in transport circumstances and transport prices. Moving out of the cities then comes at a cost!

All-in all, evidence is being build that moving from gentrifying neighbourhoods to other locations will in most circumstances create higher transport costs for households vulnerable for transport disadvantage.

## 2.4 Transport disadvantage in cities in the developing world

More than 90 % of the literature on social exclusion related to transport, on transport equity, on transport disadvantage or on car related economic stress is written on situations, circumstances and practices in OECD countries, or clearer, in the developed countries. Perspectives from developing countries are almost lacking, an exception being *Vasconcellos; Urban Transport, Environment and Equity. The case for developing countries* (2014). In this book the focus will be on the OECD world, but sometimes an excursion to the developing world will be made. Six situations will be presented here, that together give an interesting overview of the problems and magnitudes developing countries face in reaching inclusive transport, for all households and individuals, in their cities.

For Africa, we have literature from **Dar es Salaam**, the capital city of Tanzania. Although somewhat older research is at stake (Diaz Olvera, Plat, Plochet, 2003), the problems still remain. In Dar es Salaam the vitality of the informal transport service (daladalas) , often called paratransit, compensates for the failure of the formal public transport. Bigger cities in Africa have seen in recent decades an enormous growth in area, but not so much in density. The road network to facilitate this growth consists of rather well- maintained radial roads, leading to the CBD, and rather poor, often unpaved collector roads, facilitating traffic in the wards. Interconnectedness of neighbourhoods is difficult to reach, as to get out of the wards you have to move to main roads, that are already congested. This makes bigger shops and markets difficult to reach for poorer ward residents. The paratransit system consists of *daladalas* that follow routes with not very many stops. To reach a daladalas bus stop people have to walk mostly between 15 and 30 minutes. And even paratransit is rather expensive for poorer households. This means that most individuals live rather sedentary life's in their ward, their neighbourhood. Most citizens in 2003 did not use any form of motorised transport on an ordinary weekday, and there is a gender perspective, as most women stay in their wards. Most services are located in richer wards, only schools are more evenly distributed. From poorer wards takes time and money to reach health care or bigger shops. This situation in 2003 was even worsened in 2014 (Mkalawa, Haixiao, 2014).

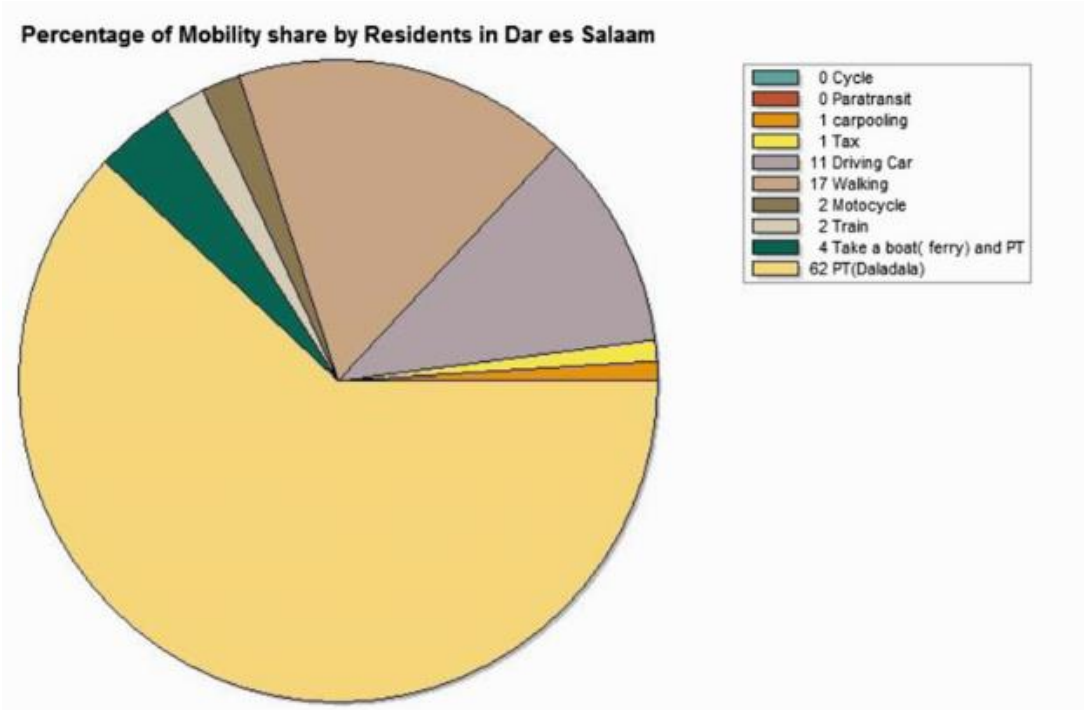



Figure 1. (2014) Current mobility share mode in Dar es Salaam indicates that the split of mode share is dominated by public transport followed by walking. Cars are used by the least number of residents, but the trend changes with time (FIG 3) between 1979 and early 1980s, when a substantial number of residents resorted to walking as their major means of mobility.

In the twin city of Pakistan, **Rawalpindi/Islamabad** the lines of gender- based transport, income and location based transport disadvantages come together (Adeel, Gar-on-Yeh and Zhang, 2016). Only on a few important routes, busses are functioning. Most public transport goes in wagons of 12 or 18 seats. Women almost never use public transport, only for religious festivities. When they travel they use private cars (taxis). Men are the users of the forms of public transport, but they also walk a lot, and consider offered transport discomforting and slow. Transport is especially for lower income Pakistani a great share in their household budget, somewhere between 20 and 25 % of all expenditure. Governments are more active in stimulating car travel, which is unreachable for a majority of households.

In **China** great progress in the development of public transport systems can be noted in the last 15 years. This development was almost always the result of work and investments of local governments, the national government remained non- active. This resulted in public transport systems in the biggest cities of good standard, although the urban peripheries are not served well. Problems, due to lack of own capital, did arise in the somewhat smaller cities. These cities have, on average, far less public transport coverage. Larger cities in China now have shorter travel distances for people to assess their services (Deng et.al.,2016). China did experience rapid urbanization in the last three decades. Migrants, often from rural areas, moved to the cities. Most of these migrants do not reach the core areas of these cities, but find shelter at the periphery of the cities, often in massive squatter settlements. A study in these “suburbs” in **Shanghai** shows that migrants living here could build social capital and social networks rather difficult, and public transport was often not offered or organised. They remained in settlements with other migrants from the same areas of origin. Migrants living in the cores city reached far higher socio- economic status. Migrants in suburbs felt “stuck or trapped” in their peripheral area (Shen, 2017).

Ending this paragraph in Latin America, the public transport system originating from this continent, the Bus Rapid Transit, created a big, but still not complete change in the delivery of transport. In **Santiago de Cali**, the third greatest city of Colombia, until the introduction of the MIO, the local BRT system, public transport was dominated by 30 private operators which offered services along 233 routes. This organisational chaos ended in " penny- wars" to get customers and in very low safety levels (in more than 40 % of all accidents public transport vehicles were involved) and unsatisfied customers. The MIO did restructure this sector, at least partly. Also in Santiago de Cali, there are areas with under-provision of public transport, and this are also the areas with the worst economic conditions (Jaramillo, Lizarraga and Grindlay, 2012).

The increasing quality of urban transport eases opportunities to access employment and services for lower-income groups, important as many citizens depend exclusively on public transport. But also problems do arise, as cities grow and congestion increases, the costs of travelling increases in terms of both money and time. In **São Paulo** and many cities in Latin America, lower-income households often live in distant areas of the city, where housing at a lower price is available, but often without adequate public services, including public transport, forcing them to walk or use an increasingly restrictive public transport (Vasconcellos, 2005). Lower-income groups spend between 20 and 40 per cent of family income on transport. This burden was partly responsible for the riots in Brazilian cities in 2013 (Verlinghieri and Venturini, 2017).

Summarising the situation on urban transport disadvantage in the developing world an interesting split can be noted. China and Latin American countries are investing in public transport, and are creating modern and effective systems, still with access and budget problems for poorer households, especially in the peripheries of urban areas. In Africa and in the Islamic world those investments seem to be missing, and transport is or car based (for example Lebanon, 340 cars per 1000 inhabitant, and 64 % of all cars older than 17 years!, Chalak. et.al, 2016) or, more often, in the hands of many paratransit providers. The poorest households here have to rely on walking long distances or on dissatisfying public transport conditions. More attention of academic researchers on equity issues related to transport disadvantage seems needed.

# 3 Transport disadvantage in suburban and peri- urban areas

## 3.1 General overview

Suburban and peri- urban areas are the intermediate areas between the better defined urban and rural areas. As often, the "intermediate" creates most difficulty when trying to define. In *Defining Suburbs* (Forsyth, 2012) an overview of definitions of suburbs, as given the last century, is presented. At first , Forsyth notes an enormous number of definitions and descriptions, trying to describe what is in essence a myriad of different built-up areas. And she concludes; "to define suburbs as a whole, rather than types of suburbs, is more complex". Harris (2010) proposed a definition based on location, density and newness. Suburbs are outside the core or the historic city area. And suburbs are mostly less dense than their core cities, although, as we will see with the French banlieus, there are exceptions. And suburbs are almost always newer than the core cities.

As suburbs present a long- standing term for describing "development beyond the core city" (Forsyth), the term peri-urban, coined in France, stands for development even further away from this core. Peri-urban areas are in the spectrum of areas the neighbour of the rural areas, but remain within commuting distance to the core cities. A nuance should be that with growing ease and speed of transport this commuting distance has increased substantial. Peri-urban areas can now be situated at some 100 kilometres from core cities and important job centres. In the spectrum of definitions of

suburbs and peri-urban areas, transport has its role, starting with Douglas (1925) : " the heart of the city can be reached conveniently, quickly and at low cost". And suburbs are always considered as automobile based. Looking at the actual situation it should be noted that many suburbs are now functioning with smaller or even minor relations to their core cities. Suburbs have often grown to own geographical entities, with sometimes even more employment opportunities than found in the core cities. And suburbs and peri- urban areas also are residential areas for non- car households (for an American analysis, see Tomer (2011)).

With the development of suburbia, the suburban dream, mostly related to prosperity, is often questioned. I will introduce the concept of suburban poverty in the next paragraph, and many descriptions on the bleakness of suburbs and about the disadvantages of sprawl have been published, especially in the United States, and in France (often related to the banlieus). In 2.3.3 I focus on transport disadvantages. But as a counterweight, it should not be forgotten that most suburbanites like their residential situation. In many suburbs there seems to be a more or less *"perfect match" between the residential situation (nice house or apartment), the employment situation, and the transport situation (one, or more cars available) of households*. The disadvantages are than on a more societal level (inefficient use of land, too much fossil fuel used, children trapped in suburbia etc.). Willing and Pojani (2017) studied in *Is the suburban dream still alive in Australia?* the evidence from Brisbane. They concluded with a resounding yes. Households and individuals responded that suburbs are best for childrearing, for easy-going lifestyles, for spacious homes and gardens, and for privacy and peacefulness.

Peri-urban areas (also called rurban space, outskirts or the hinterland) can be described as the landscape interface between town and country, or also as the rural—urban transition zone where urban and rural uses mix and often clash. It can thus be viewed as a landscape type in its own right, one forged from an interaction of urban and rural land use.

Suburbs and peri-urban areas have developed along different lines, all over the world. But Ekers, Hamel and Keil (2012) try in *Governing Suburbia: Modalities and Mechanisms of Suburban Governance,* to describe a few common processes, especially related to the role of governments in creating suburbs. Since the seventies, housing policies were reoriented towards the development of individual houses, with the consequence of encouraging urban sprawl. And infrastructure was developed, jointly with "*the promotion of mobility as a central value of modernity*" (Ekers, Hamel and Keil, 2012) . Somewhat later the relocation of industrial firms and warehouses to the suburban peripheries was facilitated. And in the last two decades many highway locations for employment have been created, mostly in suburban or peri-urban areas (see 6.2.4). In the Netherlands, some 40 % of all employment is situated on these locations (Jeekel,2011).

In this paragraph I will focus on transport disadvantage and car related stress in suburban and peri-urban areas. Other situations than the "perfect matches" will be central here. In 2.3.2 the suburban poverty and its relation to transport disadvantage and especially car related economic stress will be described, as certainly not all suburbs are rich and thriving. In 2.3.3 a case study on transport disadvantage and suburbs will be introduced, focussing on transit restructuring for suburbs on the transport circumstances in French banlieus. In 2.3.4 I will travel from the suburbs to the peri-urban areas, and to the transport disadvantages they generate.

## 3.2 Suburban poverty and transport disadvantage

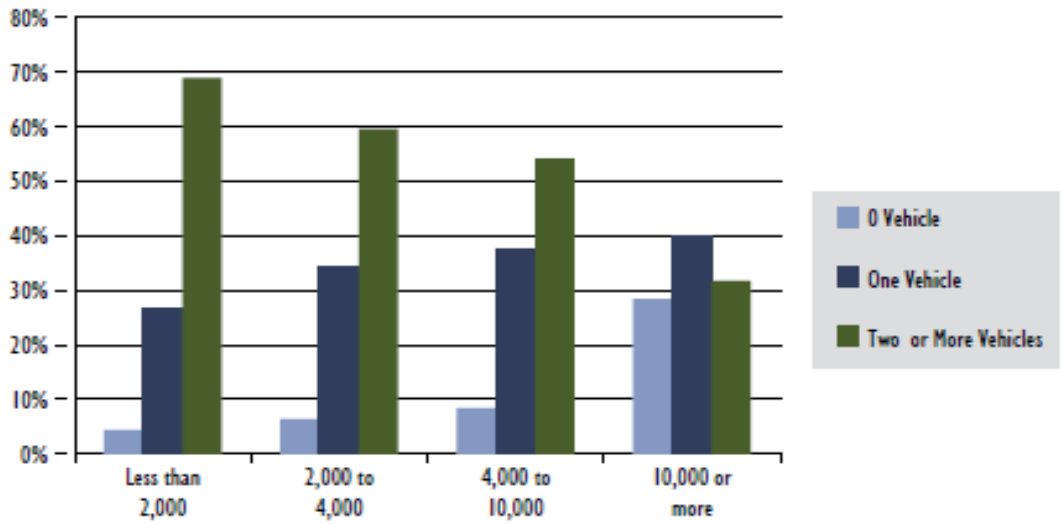
Suburban poverty seems a relatively new phenomenon. Literature comes in most part from the United States, and from Australia. This phenomenon has in the United States as yet not found its way to academia, all literature is in governmental reports and in publications from Think Thanks. Until recently the suburban narrative was about suburbs as middle and upper- class bastions, predominantly white, and with an almost complete dominance of cars and car use. The debate around the relation of poverty and place missed the suburbs and was framed in urban or rural contexts (Kneehole, Berube, 2013). But since 2000 poverty did come to the suburbs in the United States. In Europe there were already some suburbs with rather high poverty indexes, for example in France, Sweden and Great Britain. For the United States a figure is offered in the 2009 Household Travel Survey NHTS, presenting 14,3 % of all American individuals in real poverty. 10 % of the white population, 25 % of the black and Hispanic population and 13 % of the Asian population could be seen as poor (FWHA NHTS Brief, 2014). In suburbs in the United States in 2012 more than 16,4 million persons were in poverty, whereas in urban areas 13,4 million persons were poor. The last decade the growth rate for suburban poverty has been higher than for urban areas (64 % compared to 29 %, Rockefeller Foundation, 2013). In suburbs the poor were for 42 % white (in urban areas ; 26 %), for 31 % Hispanics, and for 19 % black (in urban areas ; 31 %). Nationally in the U.S., 22 % of the urban population is poor, and 9 % of the suburban population, but the suburban share is increasing.

Murphy (2010) identifies three types of suburbs getting into poverty. The first are the symbiotic suburbs. These suburbs are very near to cities, and are in a symbiosis with these cities. The second type are the skeletal suburbs, suburbs that are physical and political skeletons of the thriving manufacturing places they used to be., and often deeply distressed (Murphy, 2010). And the last type are overshadowed suburbs, fairly well to do, but with some deep pockets of poverty. Compared to households experiencing poverty in urban and rural areas, suburban low- income individuals are more likely to be married, to have children and to have more of them, to be white, to have somewhat higher incomes and to own a home (Rog et.al, 2014).

Drivers for the growth in suburban poverty in the U.S.A. vary, but most important are gentrification of the central cities, immigration and the effects of the crisis in housing and mortgage situations. Non-whites are overrepresented in suburbs where more than 20 % of the population is poor. And especially these suburbs are concentrated in California (Bakersfield, Modesto, Fresno), Texas (El Paso, McAllen-Mission) and Florida (Miami metropolitan area). In general, most suburbs with higher poverty levels can be found in the West and the South of the U.S.

Suburban poverty is in some respects different from urban poverty. At first, it seems less concentrated, and is more difficult to be noticed. Secondly, as concentration is lower and many jurisdictions are involved, it leads a more “secret life” in policy formulation. Also, there are far less funds (as compared to inner cities) available for helping poorer households and individuals (Murphy and Wallace, 2010). And there is a huge difference in the transport situation. Far less public transport (transit) is offered in suburbs, which is detrimental to non- car households and individuals. Households and individuals in poverty make more than three times as many transit trips as those with higher incomes. They walk far more, and make more trips together (MOV; multi occupant vehicles). In general, 9 % of all American households have no car (AASHTO,2013), this is 11 million households. This share grows with density.

Figure ; cars per household, related to density U.S., 2013 (AASHTO,2013)




In suburbs the percentage of non- car households centres around 5 %, mostly the poorer households. This means that around 2,5 million suburban households do not have access to a car. These households need to take transit to reach employment, health care or services. However, as we saw transit is offered far less in suburban environments. Public transit is more geographically dispersed in suburbs than in cities and runs less frequently, making it difficult for families to rely on it to address concerns (Rog et.al, 2014). In a study of The Region 2 University Transportation Centre (UTRC, 2015) it was concluded for three New York State areas that there was reduced transit access in the suburbs. The

Rockefeller Foundation (2013) revealed that compared with inner cities suburbs provided worse access to affordable health providers, including preventive, primary and specialty care.

From the figures of AASHTO (2013) can be noted that 5,1 million workers in the U.S. do not have the availability of a car. Compared to the 11 million non- car households this shows that many non- car households are retired or for some other reason non - employed. 30 % of the suburban poor were unemployed in 2011, a rate that reflects, at least partly, the lack of access to jobs. As the Rockefeller Foundation (2013) explains, only 4 % of jobs in poorer suburbs can be assessed by transit within a 45 minute -commute, and 25 % within 90 minutes on average.

To all these figures there are at least two caveats. The first is the difficulty in getting figures of non- car ownership right. Klein and Smart (2017) did research based on other basic data than AASHTO, the data of the US Panel Study of Income Dynamics and arrived at 13 % non - car owning households (instead of the 9 % from AASHTO). And the second difficulty is even more interesting. In an earlier study the same authors (Smart and Klein, 2015) found that for the greater part of this 13 % being "carless" was a temporary condition. Only 5 % were completely carless, meaning that the other 8 % jumps from car ownership to carless-ness and vice versa. There is, especially among the immigrants, the blacks and the poor, a sort of ephemeral car ownership. This can be explained by the following quote ; "*For poor families, it was found that having one car per adult decreases the odds of a family member becoming unemployed by just over 10%, and it also increases earnings by 9%, for the median poor family, an income gain of roughly $2,300 the year after gaining their first car. While this is a substantial increase in income, owning a car is expensive. It was estimated that, for the typical poor family, a used car costs just over $4,100 annually to own and maintain. (New cars cost more, at $6,400.) Thus, for many families, the income gained from obtaining a car might be less than the costs of owning and maintaining that same car.(*Smart and Klein, 2015)" Here we see that car related economic stress can be a temporary phenomenon, only existing when the gains of having a car are higher the the financial burden of owning one.

All in all, from these figures *a picture arises of poorer suburbanites often without access to cars having rather often real trouble in reaching appropriate jobs, as a result of non- existence or weak delivery of transit services.* The magnitude is unclear, but could be around 1 million Americans, of which a part finance themselves temporarily out of this transport disadvantage by buying cars. For European countries the situation seems even more unclear: rather few statistics, and also no academic research on the suburban poverty themes. As Hunter (2014) notices: "perhaps because of its ambiguous nature suburbia is ignored by much of the academic community". However, there are a few exceptions. At first, Scheiner published for the German situation *Verkehrskosten der Randwanderung privater Haushalte* (2008). He states that going to live in suburbs leads mostly to lower housing costs, but to higher transport costs, combined leading to higher household costs. The increases are greater when moving further away from city centres. And the increase is particularly big for households purchasing a second car for their commutes, with an additional transport cost range between 350-400 euro per month. A more detailed study for Dublin arrived at comparable conclusions (Rock, Ahern and Caulfield, 2016). 45 % of the non- car households in a neighbourhood 12 kilometres from Dublin centre considered transport to be a significant barrier to finding a suitable job. And only 30 % of the non- car households reported that they did not need a car. Most poorer households had cars, placing a financial burden to their low budgets. Car related economic stress was noted particularly for low- and middle-income multi-car households. And from my own research in the Netherlands came the conclusion that now 40 % of all employment in the Netherlands is situated near to highways, mostly in suburban areas, while in almost half of these work locations no public transport is available (Jeekel, 2011). For England and Wales Hunter (2014) provided a comprehensive overview on transport poverty, clarifying that whereas 60 % of the population lives in suburbs, now 57 % of all households in poverty live in suburbs.

And the gap is narrowing. An important development in this respect is the rising housing costs in central cities, driving lower income households to relatively cheaper suburbs.

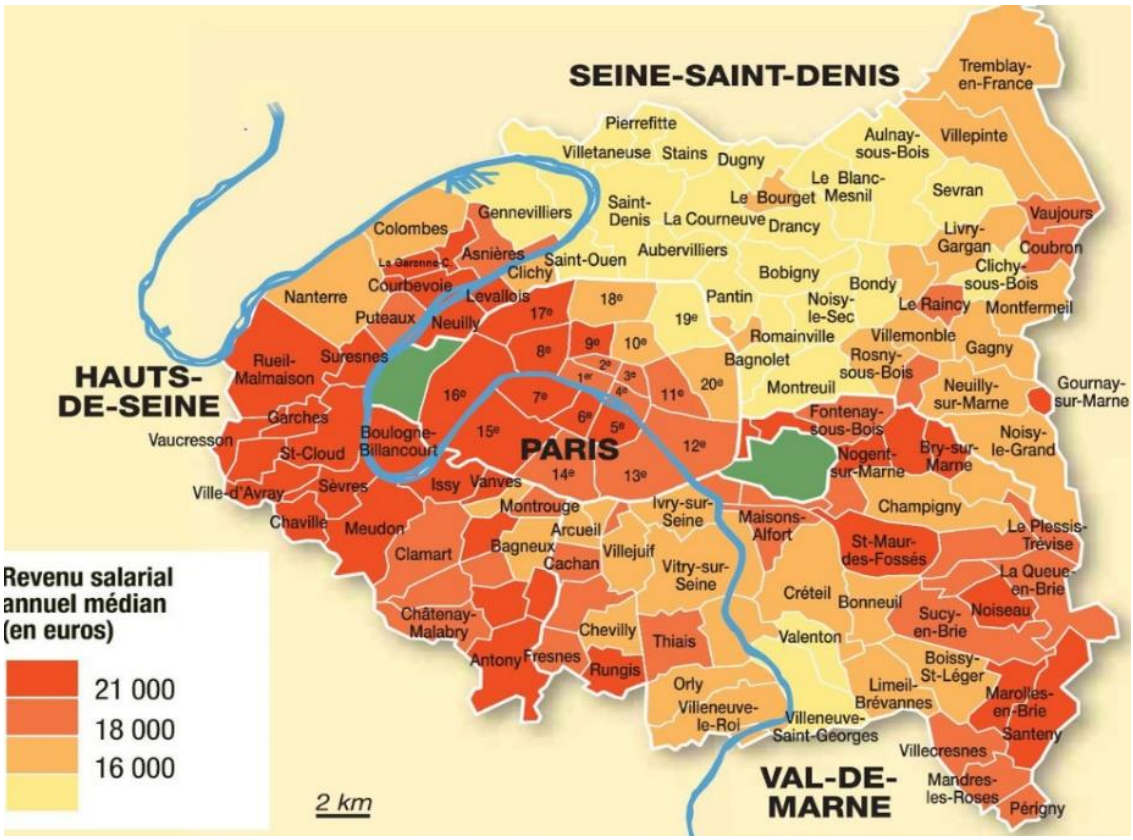
## 3.3 Suburbs and transport disadvantages; the *banlieu* as an example

Compared to urban and rural perspectives on transport disadvantage the suburbs are under-researched, and also statistics are difficult to find, probably partly related to the definition questions on suburbs (Forsyth, 2012). However, there is more literature available "*once you cross the Anglo Saxon border"*. To explain this; when I started working on the themes of transport disadvantage and social exclusion via transport I was struck by the enormous ***Anglo Saxon bias*** in the literature. Almost all authors originate from the United Kingdom, Australia, Canada, and even authors from the Netherlands or Scandinavia are using Anglo Saxon frames. It looks as if literature from the French, the German, or broader, the Third World - language areas (although this book concentrates on the OECD world) is non- existent. This, however, is not the case. There is a rather rich French literature on these themes, while the German literature is less rich, but available. It comes to my mind that academic authors that are not publishing in English, tend to be forgotten or marginalised. As I consider this below academic standards, I will introduce the most interesting German and French publications, to create at least a broad view from OECD countries. As a first step, in the next two paragraphs, the bias will be on two French situations.

Banlieue of Clichy-sous-Bois

One type of suburb in France is rather famous in the world: the banlieue. Banlieues are the suburbs at smaller distances, between 8 and 30 kilometres from the major French cities. Banlieues were partly constructed after the second world war, and are mostly dominated by high rise flats, created with an urban planning vision dominated by the ideas of the famous architect and urbanist Le Corbusier. Partly banlieu neighbourhoods are older, and originated after Hausmann restructured Paris around 1840, as a great of the population was forced, through rising housing prices, to leave the Paris centre. After the Second World War the "grands ensembles" were created, and in 1959 the minimal magnitude of a building block in the banlieu should be 500 apartments, but many building blocks contained far more apartments (Glasze,Weber, 2010).

Until the early seventies the banlieus were mixed in population. With growing prosperity the midlle classes moved out, leaving the houses for the immigrants from the former French speaking colonies. And the centre cities started to gentrify, which created migration from poorer urban households to the banlieus. The banlieues are now rather poor, as the example of Paris (map below) shows.




The first riots in the banlieus started in 1981 in Lyon. A “Politique de la Ville” was created for the banlieus, as a policy aimed at combining economic, social and urban planning goals .Special areas, the so calleds ZUS (zones urbaines sensibles) were created, there are 751 of such zones (in which 8 % of the French population lives), of which some 100 are really problematic. The problems are mostly combinations of unemployment, segregation, discrimination, and bad housing. Actually, 90 % of all classified problem areas of France are situated in the banlieus.

Central element in the “Politique de la Ville” were contracts between the central government and the local governments. However, due to political struggles, only minor budgets became available from central government. Citizens living in the banlieus, and especially those living in the 100 really problematic areas started to feel stigmatized. The riots of 2005 (where 9200 cars were burned!) were an expression of this situation. As economicaly disadvantaged areas marked by ethnic segregation, the banlieues continue to trouble French society and remain central to the discourse on the city (Gonick, 2011). In *Die banlieus als Gegenorte der Republique* Germes and Glasze (2010) present a discourse analysis on the banlieues. In France banlieues are now seen as “lost territories”, that have to be won back.

Garbin and Millington (2011) offer a view from within the banlieues, with a focus on La Courneuve. Citizens see themselves as marginalised, as can be seen: “*I have never experienced racism in La Courneuve, but outside yes, and also when I say I am from La Courneuve, like in my work*”. The role of the media, in creating this social exclusion, seems important, as their frame is on failure, riots and problems. Citizens even feel marginalised in their mobility; “*They don’t even give us time to get off the RER (the Paris fast light rail system). “Aubersvilliers-La Courneuve, come on , get out”(allez, degagez!) They treat us like dogs and all this because we live in La Courneuve. But when the RER stops at La Plaine de France, the next stop, it goes slowly. “*

Moving deeper in the transport situation it is clear that many individuals and households living in the banlieues feel trapped in their area. In a French study from 2002, *La pauvreté peri-urbaine: dependence locale ou dependence automobile,* Coutard, Dupuy and Fol compare the use of the car in two rather poor neighbourhoods near cities, in France and England. In the French banlieue neighbourhood a third of the households has no driving licence and no car. It mostly handles about big, extended families, living near each other and supporting each other. Shops, partly subsidised, are nearby, and the same holds true for a spectrum of government services. Only a few people leave their neighbourhood or its immediate surroundings. There is a low mobility need. Everything can be found in the neighbourhood, but they are more or less stuck there. This is "dependence locale".

In England another picture can be seen. First, non-car use is far lower, 22 per cent. There are no shops and no government services in the neighbourhood. Without a car you are really stuck. You then have to use the infrequent public transport and expensive taxis. The car, rather expensive in the small budgets of lower income families, gives exactly the ticket they need to participate in society and to be able to buy groceries. A car is in these circumstances a necessity. This is called "dependence automobile". This study shows how differences in political style, attitude, and decisions lead to generating or avoiding car dependence.

Moving out of the banlieues is not that easy. A number of studies (see Panerai,2008) show that the Paris public transport network is one of the most unequal and centralized urban transit networks in the world, and : "*the continual negligence of the banlieues, especially low- income banlieues, in transportation exacerbates other social problems and reinforces a markedly colonial model of spatial relations*. "(Enright, 2013). Enright presents an interesting example. Clichy- sous- Bois, where the banlieu riots of 2005 started, is only 15 kilometres from Paris, but the commute takes an hour using existing public transport. The French urbanist Chemetov (2009) on this issue; "*while the centre is de-peopled and a benefactor of a mass transit system, the periphery, where most population lives, is underserved*" . The basis is that the Paris system is still focussed to moving to and from the centre, with in the periphery only a few stops (as stations on the RER are 2-3 kilometres apart), and with only few suburb- suburb connections. As in suburbs most industrial areas are found, and thus the employment locations for a majority of banlieue inhabitants, the people from the banlieues have to travel (at higher costs) first through the city centre to reach the other suburbs. Mignot (2008) broadens this situation to all French cities as in most cities public transport is organised along radial lines as if the employed from the banlieues all work in city centres. The connections in the periphery *"imposent donc souvent de passer par le centre, afflaiblissant leurs performances" ("*Often impose to pass through the center, thus weakening their performances').

An interesting example can be seen for another population group, the students. Choplin and Delage present, in *Mobilites et espaces de vie des etudiants de l'Est francilien; des proximites et depandances a negocier* (2011), a case study on students in a difficult-to-reach smaller university. The university is located between Paris city, the suburbs and the rural areas. Students come from throughout the region, but most public transport does not offer services from their villages and home cities to the university directly. They can travel via Paris, but this is rather costly. They are very car dependent but only half of them has a driving license and only 28 per cent has a car. Each student searches for solutions to the problem but mostly the result is being driven by the parents after long negotiations, or using expensive public transport. Kenyon (2011) studied this theme for students from the university of Kent and noted that especially for first students in a family inadequate access to transport could be a substantial barrier to access and achievement in higher education.

To resolve part of these mobility problems a huge project is now starting in Paris, the *Grand Paris Express.* This project is creating a number of new metro lines, and has the potential to unify the Paris

region. But, as Enright (2013) argues, it could also entrench rather than relieve the problems of territorial inequality. The main rationale of the project is that infrastructure is good for economic development. Six “sites for intervention” – La Defense (finance), la cité Descartes (green economy), Roissy (airport), Le Bourget (aeronautic research), Saclay Plateau (technology) and the Seine Valley (biotechnology)- have been singled out and will form the new urban fabric. In this design no attention is given to the transport disadvantages of inhabitants of the banlieus, but some new routes could increase their possibilities.

There is an example the other way around. In Lyon Bouzouina, Cabrera Delgado and Emmerich (2014) concluded that between 1985 and 2006 the public transport was ameliorated for almost all suburban population groups, albeit that for the lower income groups this worked out in a more heterogeneous way, with some neighbourhoods still rather weak connected to the central core and to the employment areas.

In a creative study *Roads, Railways and Regimes*, Harris (2007) considers the designing and defining public transport on a more abstract level. He asks the question why some societies are able to organise suburban public transport- and why others fail to do so. His answer is rather surprising. He introduces two different regimes for governance: Utopia and Arcadia. Arcadia is about giving space to automobiles, to private development and to a naïve sense of “user pays”. And Utopia is about high quality- public transport, urban planning, nodal land development and elements of development banking. In his vision, English speaking states prefer Arcadia to Utopia, whereas in Europe it seems to be the other way around. Harris’s vision offers an interesting frame, but in recent times the whole OECD world seems to have grown more towards neo-liberal Arcadia, which is not particularly helpful for involuntary transport disadvantaged households.

## 3.4 From suburbia to the peri- urban areas

In this paragraph the peri- urban areas are central. These areas are located between the suburbs and the deep rural areas and are most some 60-100 kilometres away from the central cities. Most countries do not consider these areas as a specific category, in these countries the end of suburbia “flows over” in the rural lands. But in France this “in between- zone” is defined as an area on its own.

First some thoughts on transport disadvantages related to suburban and peri-urban life in two countries, from a more generic viewpoint. Williams, Pocock and Bridge (2009) developed an overview of suburban life in Australia, looking at ten suburbs. Their focus was on how households link aspects of work, home and community. They define intricate interplays and see this linking as a question of reaching equilibria. Transport is essential as the spatial configuration of home and work should not lead to unnecessary (from households point of view) robbing valuable time, just because timing and time pressure are essential elements for working adults in suburban life. Many households, especially those with two- earners doing two commutes find that their spatial configuration of work and the rest of life “sucks”. Here we reach the boundaries of involuntary transport disadvantage. Is this still voluntary (yes, the households did choose for the suburban location) or already involuntary (their expectations on the configuration were probably different) transport disadvantage? Another element considered important is the immobility of some groups, as for many teenagers, frail elderly and poorer adults there was no alternative, and their transport disadvantage was perpetuated in suburbs with poor public transport. They felt trapped in their suburbs. They are living isolated lives , or feel marginalised in their communities. From a German perspective Scheiner et.al (2010) noted dissatisfaction related to underestimation of commuting times, to the non- existence of good functioning public transport, and to related higher transport costs than expected when the move into suburbia was made. Stutzer and Frey (2008) also looked at the situation in Germany, where people

with long commute times are less satisfied with their lives. The authors suggest that one major reason is found in over-estimating the capacity to adjust to long working days. The advantages of living in suburban areas do not compensate for the loss of leisure time and the necessity to travel each day the same long distance. And Olsson et.al (2013) concluded for Sweden that over longer distance satisfaction with the work commute decreases.

Households and individuals living in the peri- urban areas have even longer commutes. I introduced their transport situation already in 1.2.3. Here I will look in somewhat more depth at a few interesting themes related to peri- urban residence and living. The first is the lack of proximities, as in most villages and residential areas in peri- urban areas there are only few or even no services available and densities are so low that the inhabitants have to drive all the time rather long distances to locations for their shopping, leisure, sport, health care, childcare etc. Although internet shopping gives some relief (Chevallier, De Coninck and Motte Baumvol, 2014), mostly the inhabitants are extremely car dependent.

As a 15 year old French boy explained, when being asked to make a characteristic picture of his peri-urban upbringing he photographed this and clarified "*Je pense que cette photo est très representative pour ma commune car la plupart des gens qui y habitant empruntent cette route tous les jours pour aller travailler ou pour aller au lycée. ( "* I think this picture is very representative of my village because most people who live there use this road every day to go to work or to go to high school ").

Spending hours on the road, driving or sitting, is the characteristic experience of most members of peri- urban households. All this driving creates a burden on the household budget, especially in times with higher fuel prices. Le Néchet, Nessi and Aguilera (2016) concluded that many households try to adapt to this situation (on this theme also Ortar,2016) and thus try to avoid car related economic stress, by being careful in the design of their trips, and by trying to combine trips. The need for flexibility in trip planning is stressed as their way of life and is expressed by the use of a variety of shopping places in the context of shopping and not to a loyalty to a single one, due to the fact of not having a day or a fixed schedule in the week to carry out these activities. There is an anxiety for the consequences of higher energy prices, but the households do not feel any guilt on not being very sustainable in their lifestyles, as they cannot think of any alternatives.

An element that could lead to stress in these households is the long commute. Travelling time increases the perceived stress level, and possibly especially the unpredictability of travel time can lead to stress (Gottholmseder, 2009). There seems to be a gender element involved as women suffer far more from long and unclear commuting times then men (Roberts, Hodgson and Nolan, 2011) Many peri- urban households want their already long trip to work to be without any delays, but especially when reaching the more densely populated areas congestion could lead to long and unpredictable travel times. Most

people arrive late from their distant work. This means that on weekdays there is not much community life possible. Most peri – urban communities know a "*community light"* meaning that bonds between households are loose, pragmatic, functional (Lupi, 2005). More scientifically stated; "…*most residents want to identify with their neighbours in a way that is characterised by a certain distance in combination with easy, flexible and shallow contacts"* (Hortulanus and Machielse, 2001). There is, however, also another development in the French peri- urban areas, the "*clubbisation"* (Charmes, 2009), meaning that newcomers will take over local politics from the long standing inhabitants, and start to consider the village as a strictly residential neighbourhood, using for example strict residential zoning to create a threshold for newcomers (the "last arrived"- syndrome).

With such a heavy domination of car mobility, individuals and households without easy access to cars can face involuntary transport disadvantages. Starting with the *youth*. Younger people mostly have to travel smaller distances for primary education, but real greater distances to secondary education. Distances of more than 25 kilometres are often at stake. This means that these young people have two poles of living, the school residential area (on weekdays), and their own village (in the weekends). From a transport perspective two situations are important, the journey to and from school, often made by a designated school bus, with fixed times, meaning sometimes long stays near the school environment, and the transport in the living neighbourhood, where rather often no public transport is available. Looking at the French literature their situation is somewhat undefined. Reading Goyon and Ortar (2009) and Institut d'Amenagement et d'Urbanisme (2013) real problems can be noted. For children in secondary school, Goyon and Ortar state " *Si les parents « choisissent », entre contraintes et opportunités, un mode de vie périurbain, leurs enfants sont eux, de fait, également pris dans ce jeu entre « subir » et s'adapter. Ce jeu influe sur leurs perceptions et compétences pour le présent comme pour l'avenir. Il y a là un paradoxe : alors même que l'un des arguments avancé par les parents comme déterminant dans leur choix d'installation en périurbain est d'offrir une « vie meilleure »4 à leurs enfants, ces derniers, arrivés à l'adolescence, se trouvent pris dans un mode de vie qui peut les contraindre fortement. Leur mobilité quotidienne, dès le plus jeune âge pour nombre d'entre eux, s'avère fortement contrainte, entre école et domicile, avec des activités extrascolaires réduites et des aspirations contrariées à une mobilité indépendante.* ("If parents "choose" a peri-urban lifestyle, their children are, in fact, equally caught in a game between "undergo" and adapt. This game influences their perceptions and skills for the present as well as for the future. This is a paradox: even though one of the arguments put forward by parents as a determinant in their choice of peri-urban settlements is to offer their children a "better life" , adolescents find themselves caught up in a way of life that can strongly constrain them. Their daily mobility, from a very young age for many, is strongly constrained, between school and home, with reduced extracurricular activities and aspirations thwarted to independent mobility."). To present an example, a girl visited the lycee in a city 30 kilometres from her peri- urban village. With long school days, plus travel, she was away from home between 7.00 in the morning and 6.30 in the evening. There was no time for leisure on weekdays. And in weekends lack of transport can create problems in visiting friends. Walking, asking parents to bring you (not very much independent mobility here!), or after 16, a scooter could be helpful. But there are adolescents that immediately mention; *"ici, on s''ennui"* ("here, we get bored") . However, this clear description of involuntary transport disadvantage is mitigated by the results from a thesis where adolescents themselves could describe and photograph their situation (Didier- Fevre, 2013). From this thesis, the picture arises of adolescents that like their living circumstances, often consider their home – school arrangements burdensome and controlled, but see some freedom from their parents in these journeys and in hours not in school, in the city waiting for the school bus that at a fixed time picks them up. And in weekends they seem to find their ways and arrange their transport. As one boy remarked photographing his feet; "this is my main transport mode". Next to that mode adolescents do hitch hiking, ask their parents, or get a scooter. So, some of them try to juggle with several means of

transports. But, all-in all, there seems to be some room for a conclusion that the transport situations of the adolescents in peri- urban areas are on the verge on involuntary transport disadvantage!

Looking at the *elderly* immobility can lead to life changes. The car is for them "*the symbol of the last autonomy"*, as it is called in the report of the Institut d'Amenagement et d'Urbanisme (2013). Often their housing situation in the peri- urban area has already changed, from an individual house that what is called a "parc collectif locatif", a smaller house in a housing estate. But their car is kept as long as possible, as older people often fear that they have to move to another location without independent transport. Giving up on car mobility drives them into unknown territories, and often they resist advices from children and family, thus creating difficult situations (Mondou, Violier, 2010).

I already discussed the situation of *households and individuals living for a long time* in the peri- urban area, before the arrival of the newcomers. They noticed through the decades the decline of service levels in their village, until no shop was left. They had to cope with a decline in their circumstances. A number of these households and individuals migrated to more dense areas, where they could live without a car (Motte Baumvol, Massot and Byrd, 2010, Motte Baumvol and Bonin, 2013).

At the end of this chapter a short summary on involuntary transport disadvantages in suburban and peri- urban areas is useful. Involuntary transport disadvantage is at stake for non- car households and individuals in suburbs where public transport networks are designed and created in ways that are not helpful for their main trips. This situation also holds for the adolescents, and the elderly, plus for non-car - households that always lived in their villages in the peri- urban areas. Car related economic stress can be noted in situations with high fuels prices in peri urban areas, and in suburbs with poor households that decide to buy a car to reach at least the important locations. And I noted psychological stress in peri- urban areas, related to long commutes and long working days, and in suburbs like La Courneuve, where elements of discrimination could be seen. Young people, and the elderly and disabled can feel isolated in their peri- urban areas.

# 4. Transportation disadvantage in the rural areas

## 4.1 General introduction

The attention and the literature on transportation disadvantage started by looking at the rural areas. Rural transport disadvantage is a problem for already more than half a century. In fact this problem originates from two sources. At first the loss of functions in the rural villages. Once thriving with shops, bars, services, at times when almost all inhabitants had rather low incomes, but in the sixties, when wages started to rise rather fast, many shops, bars and services closed down, as their owners could not get a decent living anymore. This process of decline in rural services and at the same time growth in structures was introduced in *Het Kleine Dorp (The small village*), the thesis of the Dutch rural sociologist Groot from 1972, based on a decade of research. In that same period, car use started to develop in the richer western countries, with for example 34 % of all mileage in 1952 compared to 76 % of all mileage in 1969 in England and Wales. Public transport in rural areas diminished its services, and this was explained in another book from 1972, *Rural Geography; An introductory survey*, by the British rural geographer Clout, also based on a decade of research starting with the results of the Jack Committee on the future of Rural Bus Services (1959-1961) (HMSO,1961).

The process of loss of functions of villages and loss of rural public transport took place between 1960 and 1980. In the seventies scholars (Moseley,1979a, Haynes et.al, 1978, Coles, 1978, Daniels and Dench, 1974) published about those themes, with an interesting book by Moseley on *Accessibility: The rural challenge,* from 1979 (Moseley,1979b) as the most comprehensive result. After 1980, the problem did receive only minor attention, until 2001. From that date the theme remained on the

agenda, somewhat less in the academic world, but certainly with societal stakeholders. In essence, the problem of maintaining rural transport services for a small part of the rural population, in a situation where this remains necessary and expensive at the same time, has not changed in the last 50 years. The same arguments and lines of thinking remain, there has been no development, or better, no transition whatsoever. I will present a closer look at this stagnating field, that has, at least until now, proven to be too difficult for researchers and policy makers.

Groot (1972) mentions that the loss of village services was especially noticeable in the economic services, such as shops or bars (the number of grocery shops declined by 24 % on average, and far greater in rural areas in Britain 1961-1971, Coles, 1978), in the schools (with less children, and growing thresholds for subsidies), in the churches ( with less people being religious active), in the social life (with less people working in or near the village itself, the influence of commuting) and in some subsidized services such as post offices, and medical care (where economies of scale started to prevail). Groot noted that certainly not all villages declined in services at the same speed and analysed this difference by introducing the concept of "*dorpsbinding*", to be translated by "social capital in a village in the form of binding and networking". Some villages had a strong "dorpsbinding"' . This concept returns in different forms throughout the literature, and examples from North Dakota and Germany will be shown (Redlin et. al, 2010, Arbeitsgemeinschaft, 2013). The same holds true for the more socio-technical solutions on rural transport as Clout (1972) and Moseley (1979a and b) already discuss concepts such as minibuses, using school buses also for other purposes, or giving lifts, and the reluctance to accept these lifts. Moseley (1979a) discussed some myths on public transport. One of these myths was that people would migrate from their declining villages. This has not happened, or better stated, this had only happened selectively as I will show for Mecklenburg- Vorpommern, in 2.4.3. Another myth was that rising car ownership would solve the problem, as every rural household would get a car. This myth was persistent in the last two decades of the 20th century and was probably responsible for the lack of attention to this problem between 1980 and 2000 (with Cloke (1995) and Farrington (1998) as exceptions).

I will discuss the rural mobility challenge and related transport disadvantage along three lines. First , in 2.4.2. from a North American perspective, taking the Great Plains and specifically North Dakota as an example, secondly in 2.4.3. from a Western European perspective, with a focus on Eastern Germany, and especially Mecklenburg- Vorpommern. Finally,as I did with urban transport disadvantage, I will present in 2.4.4 an overview of rural transport disadvantages in the developing world. I would like to end this introduction with an important quote from Coles (1978); "*transport ….has the role of compensating people for the loss of genuinely local amenities. To work, study, eat and drink, plus a hundred-and-one other basic activities requires a far bigger transport input today than it did a generation ago".* Problems with transport thus become problems with life.

## 4.2 Rural mobility in Northern America; The Great Plains and especially North Dakota

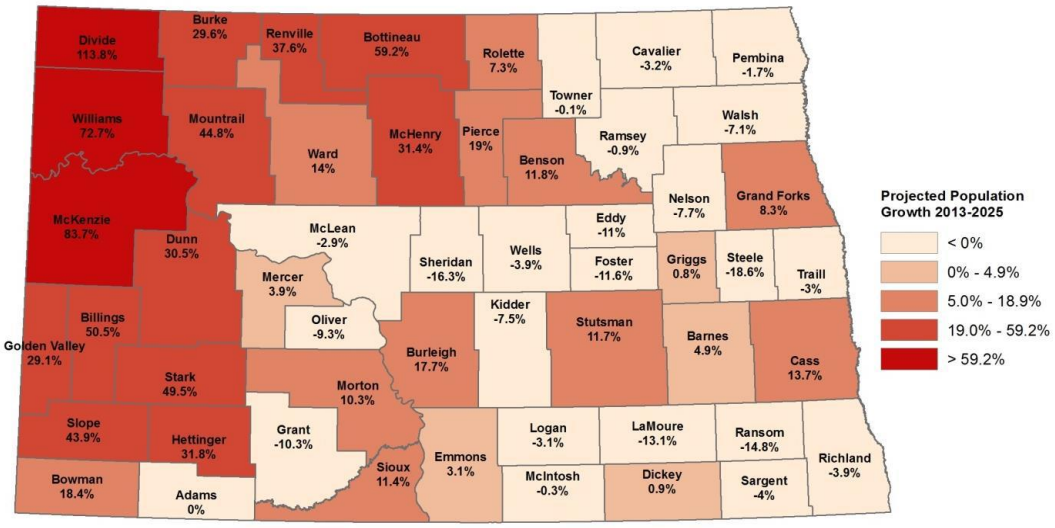
The Great Plains are situated in the United States and Canada. The environment of the Great Plains is well suited for agriculture with its abundant flat terrain, its good soils, and its mid- latitude continental climate. The vast region is sparsely populated, and contains some 30 million inhabitants between Forth Worth, Texas and rural Manitoba and Saskatchewan in Canada. The greatest Plain city is situated at the southern edge, Forth Worth-Dallas, another greater city at its Northern edge, Winnipeg, and all other greater cities are smaller than half a million inhabitants (Oklahama City, Kansas City, Wichita, Tulsa, Omaha, Sioux Falls, Fargo, Saskatoon, Regina). Almost all cities are not situated in the centre of the Plain, but on its eastern edge. The central Great Plains are very sparsely populated. Economically the Great Plains had boom and bust – periods. Agriculture and especially wheat were creating booming

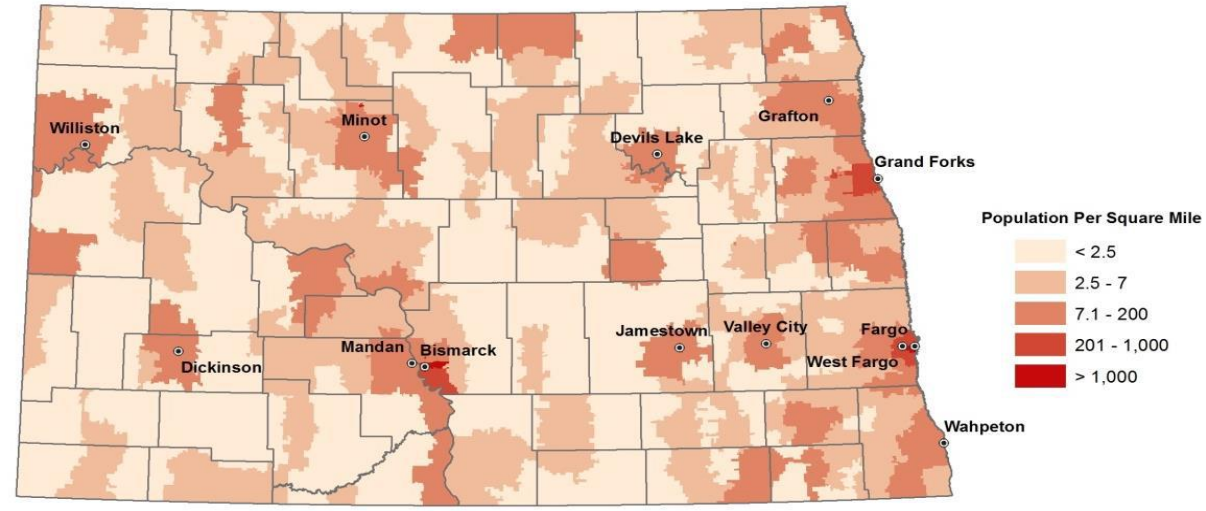
business, with around 1910 producing one sixth of the world total on wheat. Cities like Omaha, challenging Chicago as livestock centre, and Kansas City were booming. But in the 1930s the ”dust bowl” created drought conditions and great clouds of moving soil. The Great Plains had their bust, and fell into poverty. But since three decades the Great Plain are recovering, as Kotkin (2012) shows. Restructuring of agriculture led to new crops as soy beans and to the production of biofuels. Industries came to the Plains, with a focus on animal food, aerospace and communications equipment. Looking at the U.S. part, in the last 25 years the income growth of the Plains households was above American average (32 % versus 23 %, Kotkin, 2012). And in recent years fracking and horizontal drilling, unlocking oil and gas deposits, became a new business at some Plains locations.

Population at the Great Plains is another story. In the United States the Plain -states did grow in population more or less on the national average, in Canada the Plain - states had lower population growth than the national average. Within the states growth was concentrated in the larger metropolitan areas, and in rural areas almost all counties were losing population. For the year 2001-2011 the metropolitan areas (higher than 50.000) had 82 % of all population and a population growth between 12 and 20 %, whereas the rural areas had 7,6 % of the population and a net decline of 2,3 % (Kotkin, 2012). I will now move to these rural areas, the residence of some 2,5 million Great Plains’ inhabitants. Most rural counties loose populations, and the few that grow in population mostly get their gains from temporary workers, being employed in the extracting industries. This means that for normal rural counties population the loss is greater.

Rural Plain- areas are car country. The general figures will be close to the figure of North Dakota, 92,5 % car ownership, and a modal split on trips of 88 %. Transit on a regular basis is only available in cities over 70.000 inhabitants. The interesting question is how the 7,5 % non- car households, and the individuals in car households that cannot drive or cannot drive anymore, the young, the old and the disabled are moving and finding their way from their rural residences. In this paragraph I will look from three perspectives ; from the situation for the adolescents, from the situation for the elderly, and for the situation in a booming rural area, The Braken Region in Western North Dakota. I will focus on the state of North Dakota, but sometimes make a side step to Canada, which seems possible, because on both sides of the frontier the same problems and solutions are at stake.

North Dakota had 758.000 inhabitants in 2016. There are 9 counties with more than 20.000 inhabitants, and all other 44 counties have a population of less than 8000 inhabitants. On population there is a mixed view. Almost all rural counties outside Western North Dakota are losing population, often between 0,5- 1 % per year. However, the fracking boom at the Braken region of Western North Dakota did result in a vast in- migration of temporary workers, making during four years (2010-2014) North Dakota one of the fastest growing states in population in the U.S. Especially younger individuals left the declining counties of east and central North Dakota and went to larger cities. North Dakota has a rather old population in the rural regions, with near to 17 % over 65 years of age (2014). As North Dakota is an area of 184.000 km2, with a length of 540 km and a width of 340 km, distances between villages and hamlets are rather great. There is virtual no transit system outside the greater metropolitan areas of Fargo, Bismarck and Grand Forks. As Mattson and Hough (2015) explain in *Identifying and satisfying the needs of the North Dakota Transit system*, of the nine counties with more than 20.000 inhabitants only four had fixed- route services, mostly only between 8 and 6, and not on Sundays. Most other counties had only some form of demand – response service five days a week, with no or limited services in weekends and evenings. Two figures are illustrative (Mattson and Hough, 2015).

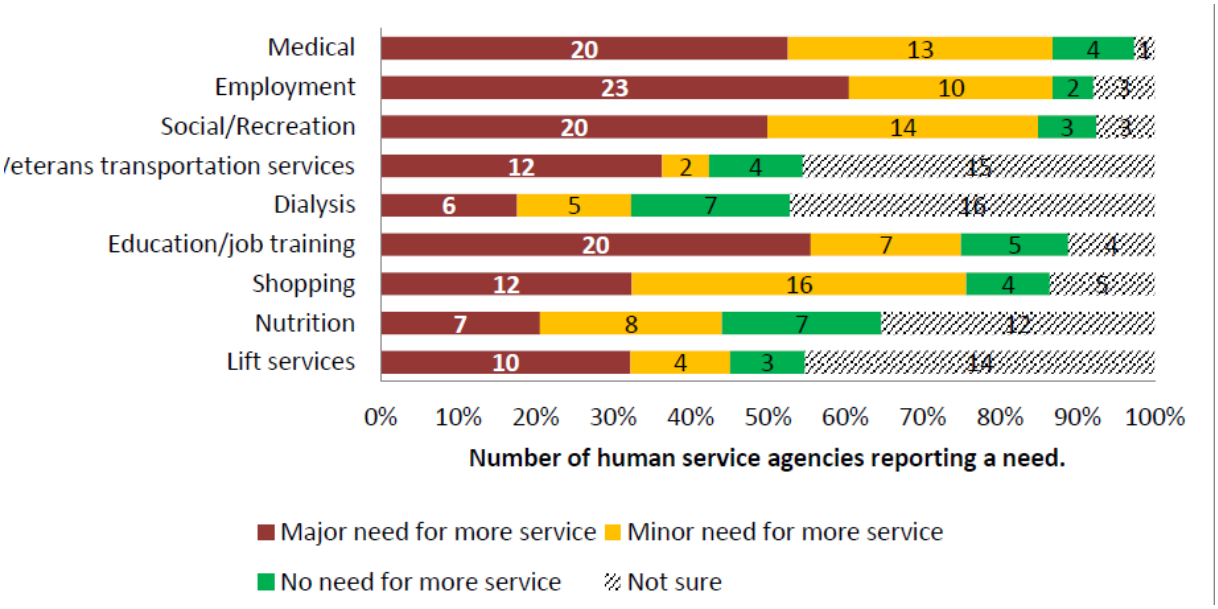



Please note that an average county is 3600 km2, thus near to 70 by 50 kilometres, and that almost all declining counties have now a population of less than 8000 inhabitants.

This means that creating appropriate transit services is very difficult. An example; Kidder county, in the centre, is expected to lose next decade 7,6 % of its population, that was 2400 in 2015. Kidder county is 3711 km2, and on 5 days, during 10 hours transit is available, in the form of transit by demand. No services at evenings and in weekends. This (picture below) is the centre of Steele, the greatest village of Kidder county (800 inhabitants), and remind that Bismarck and Jamestown, two cities above 20.000 inhabitants, are 80 to 100 kilometres away.

In North Dakota there are 8000 non- car households (Data USA, 2015), and 71.000 households have one car, leaving often a family member with a driving license without a car on workdays. How could they move at other times than the delivery times of transit? Hough and Mattson (2015) identified their needs for transit, as seen from human services agencies.




More services were especially needed for medical trips, for employment trips (now often opportunities are non- reachable), for leisure and for job training. It will be rather difficult to reach a better quality of transit provision, as counties have to pay the greatest part, and have, due to their low number of inhabitants a rather weak tax base. This results figures from Valley City (comparable with Kidder county) a modal split of 70 % driving alone, 17 % carpooling, 8 % walking, 1 % taxi or other form and only 0,4 % transit (Godavarthy and Mattson, 2016). Not owning a car in North Dakota's rural areas seems problematic. To take this broader, poverty, rurality and difficulties with transportation are closely linked (Kidder, 2006). Transit seems available to 60 % of the residents of rural America, and not to 100%.


Where this leads to can be shown by looking at the situation of the ***adolescents***. Kidder county has in Steele its own county district high school, with 151 students in years 7-12. The *catchment area* is broad, as can be noticed from this figure, (where 1 cm is 10 miles). This means that some 120 adolescents have to travel each day 10 to 50 kilometres to reach school. This is done by school busses with fixed times. After returning, children are without any form of transport, as driving in North Dakota is permitted only after 17 and then in company of an adult. In the small villages live only a few young people. Mostly there are no to minor sport facilities and clubs. Parents will give lifts to their children, but only for important activities, like going to doctors or official parties, and only at times when they are available. Offering transport to their children, just to hang out and chill with friends is

not customary, and also feels for adolescents as not leading to independence. In weekends somewhat more seems possible, but there is no transit available. Young people are trapped at home, sometimes hitchhiking, and risking obesitas, through their non- active lifestyles, is seen as a problem (Yousefian et.al, 2009). Transportation plays a critical role in the life of adolescents, as rural places lack "neighbourhoods" of comparable aged children to engage in spontaneous group activities. As Yousefian et.al (2009) write; "*these communities need sponsored, coordinated opportunities for children to be physically active"!*

Moving to Canada the rural youth form Ontario mentioned transportation as their third priority, with the explanation that it is difficult to get to and from recreational and extra- curricular activities because schools and facilities are so far from home (Ontario Rural Council,2007).

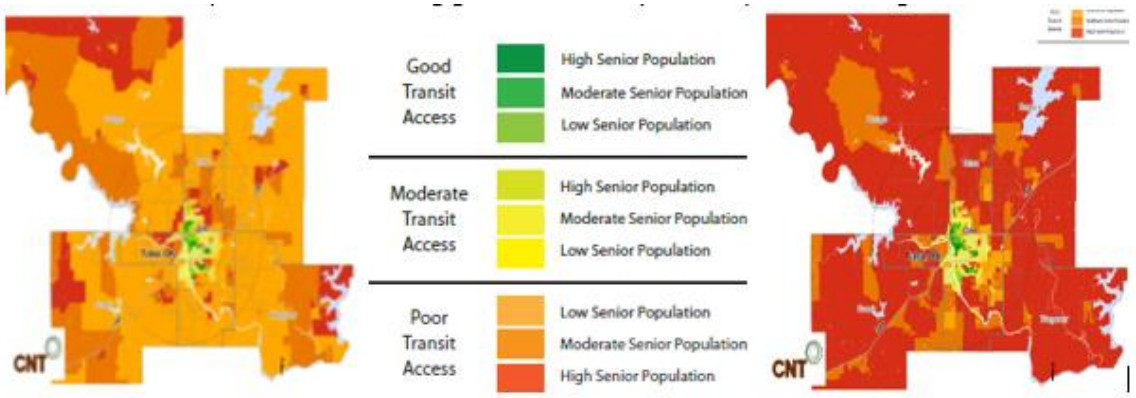
When adolescents could present their situation through photos it also became clear that transportation is vital (Walia and Liepert,2012). This picture explains a lot.

Figure 3: Photograph 2 – Unfit for physical activity

In an interesting thesis *Assessing Transportation Disadvantages and Public Transportation opportunities in rural Ontario* an in- depth presentation on the perception of transport by the elderly, the disabled the poor and the youth of Huron County is offered (Marr, 2012). One respondent stated; "*Those attending school do have the ability to be bused to and from, so that is helpful. But again there are limits. They get to be picked up in the morning and need to be on the bus by 15.15, so no extracurricular activities and no opportunities for employment".* This is the main concern of young people not being able to participate in school sports teams, clubs, social activities or other " ïn town" activities. This concern has also a relation to the schedules of parents as was explained; "*children are driven by their parents' need to have everything scheduled".* Many adolescents thus live after school rather isolated lives in rural North Dakota. Youth suicide rates on the rural areas of the Great Plain states North Dakota, South Dakota, Montana and Wyoming are four times as high as the American average ( CDC Wonder, 2016). An explanation of this situation leads back to transport disadvantage, in two circumstances. The first is the isolation ( "*the lower population density and wide geography characteristic of rural areas are potentially socially isolating, with less face-to face contact with family, friends, and other support-networks. Associated feelings of loneliness and depression could contribute to suicidal behaviour. For example, research suggests that rural individuals who complete suicide are more likely to have lacked a close intimate relationship than did their urban counterparts. Furthermore, urbanization and lack of employment opportunities have resulted in many residents, particularly the young, leaving rural communities heightening the degree of isolation for those left behind",* Fontanella et.al., 2015). Secondly is the underservice of doctors and especially psychological helpers in these areas. Also, the rural culture is not accustomed to accepting depression and vulnerabilities. And lastly, guns are omnipresent in these areas, and easily used. There is a great concern on this issue.

The ***elderly*** are a growing part of the population in most rural parts of the Great Plain states. Most elderly still have their own car or cars, but after a certain age driving becomes more problematic. At that moment the elderly have to rely on transit, on social capital or on community social support networks. These networks are mostly working for individuals in need of medical care. Doctors and hospitals are far away. There seems to be a mixed situation. On the one hand older individuals can rely

on these support networks. Deep rural communities are sometimes still existing through *"persistence strategies*" of the inhabitants as is explained in Redlin et.al (2010) and Anderson et.al (2013). This means a permanent and sustained investment and effort in creating social capital in the community. However on the other hand, many older individuals do not want to be dependent of others, and will try to remain driving. Driving cessation is a strong predictor of increased depressive symptoms in older adults (Mattson, 2010a, Marottoli et.al, 1997). People with physical disabilities make significantly fewer trips, but express the wish to get out more often (Mattson, 2012). Taken broader, there is a tendency to age in the place where you lived, but transit opportunities are diminishing (Transportation for America, 2011), related to creating greater efficiency in transport. For the greater Tulsa area, for




example, the transit opportunities especially for the high senior population have diminished from 2000 (left) to 2015 (right). Trips to health care are also rather long, for routine health check-ups and emergency care in general 31 kilometres, and for chronic health care visits 76 kilometres (Mattson , 2010b).

Looking to Canada, Mercado, Paez and Newbold (2007) noted that objectives of elderly mobility provision should be taken care of structurally. The cost of accessibility initiatives for them would be significant and this poses challenges for funding. Most local governments seems to hope for private initiatives related to social capital. In Huron county (Ontario) transport was organised for elderly by family, and by an existing transportation service for older adults, which was seen as useful and expensive, with 45 dollar cents per kilometre, meaning that a ride to and from health check-up would cost - with the same average distances as in North Dakota- some 28 dollars. Also important were volunteers, but here a split could be noted. For elderly with physical disabilities volunteers were available, but this was not the case for mentally disabled individuals (Marr, 2012).

To conclude, on the Great Plain rural areas, the combination of lack or diminished transit, dispersal of essential services over great distances, tight time schedules of middle aged households (30-60 years of age), great distances between villages, and weak governments leads to *huge transport disadvantages for the elderly, for the young and for the disabled,* somewhat mitigated by community spirit offering lifts, that however diminish independent opportunities for elderly and adolescents, while mentally disabled are not accepted to profit from these extra help and support offered.

One part of North Dakota has faced another reality since 2008. Northwestern North Dakota , the region from Dickinson to Williston, was the centre of an ***oil boom***, with the fracking industry at the Bakken region. North Dakota's economy started to boom around 2008 due to advances in hydraulic fracturing, or fracking, and by 2014 North Dakota had the fastest growing economy in the United States. The city of Williston, in the middle of the state's Bakken oil patch, doubled its number of inhabitants from 14.000 to 28.000 in four year's time. In the Bakken region there were between 2010-2014 far more

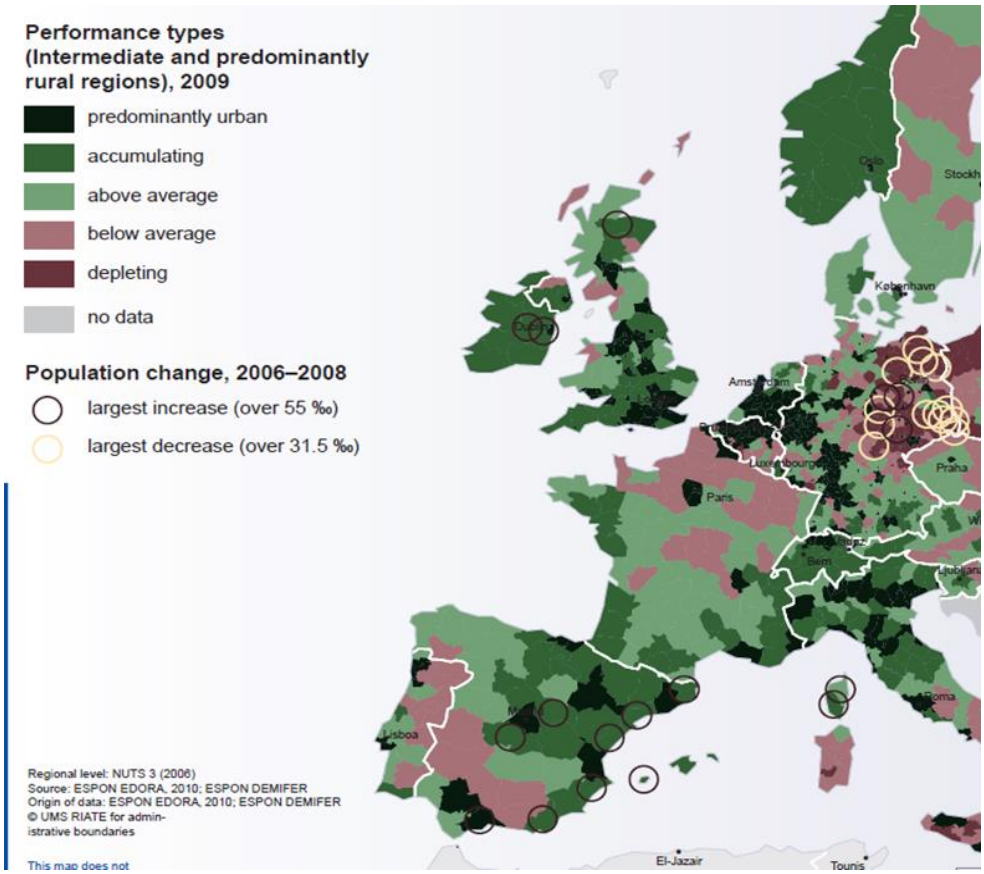
jobs available than North Dakotans could pick up. An in-migration of temporary workers started, which led to temporary homes, to higher housing and food prices, and to higher rates of criminality.

As Stangeland (2016) noted; "*Young male workers from the oil field brought with them adolescent behaviour that included a penchant for drinking and anti- social behaviour, which frayed the long-term social fabric of the community*." New workers mostly brought their own cars, but also growing demand for transit was noted, with a great passenger growth between 2008 and 2011 (Peterson, Ndembe, 2015). There came a pressing demand on better housing and better infrastructure.

However, the boom changed into a bust at the end of 2014. Though some are predicting a new boom as oil prices rise, for the time being lower oil prices have weakened North Dakota's economy and the residents of Williston—many of whom moved there to take advantage of it—are trying to figure out what to do next. Do they stay and wait for things to get better? Or do they move on to greener pastures? Government investments are lagging behind, creating now new infrastructure in the region, and starting town improvements. But are these investments still useful, as many temporary workers have already left or are on the verge of leaving? Here another form of transport problem can be noticed, related to a boom and bust- cycle. Demand for transit and roads grows at each boom, and at the moment public authorities start to deliver, the bust makes their investments unnecessary. Officials are confronted with difficult decisions. During the boom the government, getting cash and facing increased demand for city services, built a $57 million dollar high school and other public facilities. Now tax revenue is falling fast; the city's sales tax receipts fell 47% from March 2015 to March 2016. If the population continues to decline, the area is left with new infrastructure and buildings that have to be maintained by a smaller tax base (Berman, 2017). For transit provision three scenarios have been developed. In the boom scenario fixed route transit for Williston and Dickinson, the two bigger places, should have to be developed (Hough and Mattson , 2015, Peterson and Ndembe, 2015), but now this seems questionable. Natural resource dependent communities where Dickinson and Williston have grown into, experience over a longer term relatively high rates of instability, crime, inequality and unemployment (Jacquet, 2014, Stangeland, 2016, Braun, 2016). One could state that booming comes at a cost.

## 4.3 Rural Mobility in Western Europa; with a focus on Mecklenburg-Vorpommern (Germany)

Moving to Europe I will look at the situation in the rural regions of Western Europe. Where are here the transport disadvantages to be noted? There are many types of rural areas in Western Europe, as the map shows (ESPON Atlas, 2014).




On the one end of the spectrum there are rural areas that flourish, in the Netherlands, in Northern Italy, in England, in Western France, in Bavaria in Germany. There are rural areas that perform below standard, in Northern France, Southern Spain, and in Southern Italy (not on the map). And there is one contiguous rural area that is depleting and confronted with massive population loss, the rural area of Eastern Germany. This bad performance seems rather counter- intuitive, as Germany is mostly seen as a rich country. However; Germany has a great inequality between its regions (Länder). All former GDR Länder ( Eastern Germany) are performing worse than the former BRD Länder (Western Germany), and within these former GDR Länder the rural areas are performing worse than the urban regions.

I will concentrate on the transport disadvantages of the rural areas of Mecklenburg- Vorpommern, but first a few remarks on the other types of rural areas, as can be noted from the literature. Many rural areas are thriving. In western Europe, with its greater population densities, these areas lack the "friction of distance – problems" of the Great Plain states. And these areas lack the commuting and the car related stress problems of the peri- urban areas, as they are not focussed on the urban world that much. Many rural areas have own sources of income, in agro-food networks, in IT, or, often, in tourism. In these rural areas there will be transport disadvantages for the young, the elderly without cars, the disabled, and these disadvantages will probably be somewhat comparable with the ones described for the peri- urban areas. As an example, Reichert- Schick (2013) presents a description of a more remote area in the Eifel , in Western Germany. Population is not declining here, tourism is an asset, and employment can be found in Luxembourg and Trier, at some greater distances away, but only some problems of transport disadvantage for specific groups remain.

From research from the **United Kingdom** the picture arises that there are certainly problems in rural areas that are integrated in the economic networks of their societies. In the rural transport literature in Great Britain a main focus is on mobility of the *elderly.* An estimated 23 to 27 % of residents in rural England are of pensionable age (Milbourne and Doheny, 2012). Some 10 % of all rural households have

no car available, meaning that some 20 % of people living in rural areas and aged 65 and older have no access to a car. These figures rise to 32 % of those aged 75 plus and 52 % of those aged 85 plus (figures from Rural England, 2016). Mattioli (2014) showed that households without cars in rural areas tend to be more concentrated among what he calls more marginal social groups. As noted many very old households have no car, and many single elderly women. Poverty is an issue, as Milbourne and Doheny (2012) showed for rural Wales. Rural households face significant additional costs in order to achieve the same standard of living as their urban counterparts, and transport costs play an important role in these additional costs (Smith, Hirsch and Davis, 2012). As the Commission for Rural Communities UK (2012) clarifies the proportion of people in rural areas who must use a car to respond to medical issues, or to maintain a social life, is more than double that in urban areas. Similarly, 80% of rural respondents have to use a car for visiting family or transporting elderly relatives, compared to 44% in urban areas, and the difference is similar with regard to for shopping. However, at the same times subsidies for public transport in rural areas are diminished. Isolation and loneliness are issues (Rural England, 2016), as distance is shown to have a clear impact on how often older people see their families (WRVS, 2012).

As the UK Government Commission for Integrated Transport (2008) summarised ; "*patterns of movement in rural communities are often too dispersed to be handled efficiently by conventional public transport… these kinds of transport tend to require high subsidies to remain in operation ".* Shergold and Parkhurst (2010) stated that alternative rural transport solutions have limited financial sustainability in the UK, as their funding often comes from time- limited sources. And taking lifts imposes constraints for the elderly on the flexibility and spontaneity of their travel plans. Rural mobility is very reliant on the car. And this creates huge problems for households without cars, as Shergold, Parkhurst and Musselwhite (2012) analysed. The widespread use of the car is actually undermining alternatives they write, and they introduce "*a vicious circle of older people's reliance on the car. The dominance of this mode is a disincentive to the acquisition of motility capital related to other modes, and directly undermines the alternatives*". Why, many politicians seem to think, invest in alternatives, as 90 % of all rural older households, and 80 % of all rural older people still have cars available? The caveat of the authors seems important ; "*If, as a society we merely rely on the car as a solution in these circumstances it may be that we risk undermining the creation of social capital in rural communities and thus their social sustainability "'.*

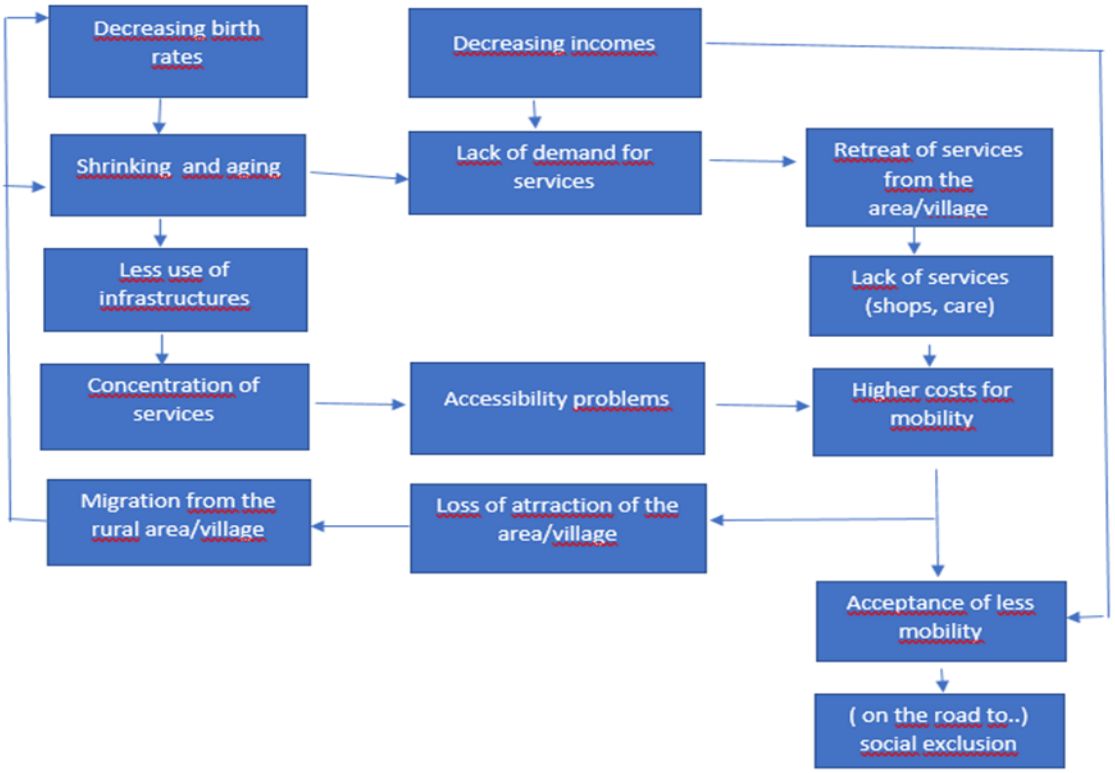
In at least one region in Western Europe rural transport disadvantage seem to be far greater. The rural areas in the **Eastern part of Germany** face problems that could be described as related to the malfunctioning of the complete society in these areas. When the Wall fell in 1989 the Bundeskanzler saw "*blossoming landscapes*" arising in Eastern Germany, to be achieved soon after reunification. He seems to have been wrong. What happened? In Eastern Germany there was a communal agricultural structure, with vast agricultural spaces, and villages where services such as post offices, social clubs, part of the shops and public transport were financed by public funding coming from the communist state and other governments budgets. Wages were rather low, but the infrastructures were well kept and maintained. After the *Wende* in Germany the rural areas were restructured conforming laws of the market economy. This meant for example that part of the funding stopped, while industries on the countryside, such as wood manufacturing or pulp and paper industry were succesfully restructured, but losing in Mecklenburg- Vorpommern for instance between 28,5 % and 43 % of the jobs in the nineties of the last century (Beetz, Huning and Plieninger, 2008). Wages did rise, but in many rural areas the thresholds to keep shops, post offices, doctors, child care services, and schools open could not be reached, when the public funding for these services diminished or disappeared. Additional, birth rates in Germany as a whole are rather low, and birth rates in former Eastern Germany were even lower. The net result has been an outmigration to cities in Eastern Germany, and especially to the Western parts of Germany.

This happens when with a change in regime , here at the economic level, forms of subsidy and support stop or diminish, or in German; *"Mit dem Systemwechsel bricht der Sonderstatus des Landlichen Raumes vollig zusammen"* ("With the system change the special status of the rural area breaks completely'') (Reichert- Schick, 2009). A word is coined for this situation of decline, of services, of population, of whole areas; "*peripherization"* (Lang,2012).

The continuous shrinking of East German regions can be seen as a form of peripherization (Lang, 2012), this being a societal process of multidimensionality of shrinkage. Only in former Eastern Germany in almost all rural areas except the ones near to Berlin, the population will decline between 2010 and 2025 with more than 10 % (and often with more than 20 %!), while the average age will grow in the same period with 5 years or more (from an already high average). (Franke and Schmid, 2013). The same situation as in Germany can be seen further east, for example in Poland, Slowakia, and Hungary.

Peripherization implies processes of centralisation; services and activities start to be concentrated at fewer more central locations. At a higher level, winning and losing regions (Länder) can be identified, and in Germany this process is very pronounced. The GPD 2015 per capita in Bavaria, Hessen and Baden- Wurtemberg is around 43.000 euro, and in the former Eastern German Lander between 24.000 and 27.000 euro, somewhat more than half. The blossoming landscapes of the prime minister sometimes now often look like this.

There are many villages in Mecklenburg- Vorpommern the most northern Eastern German Land, where 20 % of the houses are not occupied. In a situation with decline in population, services and infrastructure often the young will move, at the elderly will stay. These older households mostly own their houses, and will stay. For the mobility situation this means that households with cars are ready to travel long distances for their services. But for older people without cars, often 15 to 20 % % of the households the situation is a burden. Public transport in the form of busses is mostly structured for school children (90 % of the passengers, Riesner, 2014), meaning very few services. What happens is that these inhabitants "*resignieren und haben die Hoffnung auf eine Besserung der situation aufgegeben" ( "*have given up the hope of an improvement in the situation", Reichert- Schick, 2009).




**The vicious circle of shrinking in rural areas (incomes, services, mobility)**

Muschwitz and Reimann (2015) presented the principles of the downward spiral in rural areas. As driving forces they note decreasing incomes, and decreasing birth rates. Two remarks are essential here. At first, incomes in Eastern Germany have increased since the Wende. But as costs of providing services have also increased (and even more due to the diminishing government subsidies) the relative income has stagnated. And secondly, as Beetz, Huning and Plieninger (2008) clarified, an independent extra driving force was the restructuring of public transport with more efficiency and cost reductions in mind. In *Offenticher Verkehr und demographischer Wandel; Chancen fur Nordostdeutschland* (2007) Heinze clarifies that public transport has become very weak; "*Im landlichen Raum ist der traditionelle OPNV zu einer Restgrosse geschrumpft"* ( In rural areas public transport has diminished to a bare minimum). Getting lifts has now taken over the role of public transport and Heinze asks the question "why should not we just stop with public transport?" and argues for a change in thinking. No public transport just for youngsters, travelling to school, or for the non-car owners. Rather, better to concentrate on leisure, shopping and holiday travel for a "senior oriented society" "

The vicious circle or the downward spiral of combined shrinking, aging, lack of demand for more expensive services leads to moving out of services, to higher mobility costs, to accessibility problems , to loss of attractivity of the village or the region, to outmigration of part of the population – according to the Enquete Kommission Landtag on "*Alter werden in Mecklenburg- Vorpommern"* (2014) 23,6 % of the households think about moving to a village with more services or to a city - and thus to a new shrinking cycle. What then happens is described in an interesting thesis of Neubauer (2017); *Es bewegt sich was im Landlichen Raum. Vom Wandel und Erhalt der Alltagsmobilitat alterer Menschen in Saro*w *(Mecklenburg- Vorpommern)* . In Sarow, half of the women older than 65 have no driving license and 10 % of the men. They become very dependent in an area that is losing service quality. And otherwise than in North Dakota, these elderly were accustomed to far better services and far better mobility in

the GDR days, and even in the last decade of the last century. The village has lost 27,3 % of its population from 1995 to 2010.

How to cope with this situation for some 4 million German rural inhabitants? I will focus on this question in the second part of this book , but some first remarks here. Normal public transport will not be the solution. In fact, three scenarios are available. The first is an active government policy on shrinkage, let some villages really die, or nicer called ; *Stadtumbau (*Enquete Kommission, 2014). This strategy seems not accepted, as most villages continue to fulfil societal functions. Then two strategies remain. The first is to invest more public money in restructuring public transport with a spectrum of demand oriented smaller public transport forms (see Steinruck and Kupper, 2010). This is not very cost effective but creates temporary solutions for households. The second is to trust on the resilience of the population, and to give them some frames to create solutions for providing services and mobility themselves (compare with Redlin et.al, 2010, for North Dakota). Here it is interesting to note that in times of budget cuts, related to essential services such as schools or public transport, politicians, mostly from conservative side, hope for solutions for service provision, that they just have rationalized and thus diminished, via rural self- help strategies. Rural communities are then presented in "*an idealised way as having a predisposition to solve their own problems and a desire for self- help"* (Bagley and Hillyard,2014). This can strongly be questioned as Bagley and Hillyard showed for rural schools; "their potential cannot be essentialized".

Although there is a library on ideas (see for example; Bundesanstalt Landwirtschaft und Ernahrung, 2013, , Arbeitsgemeinschaft, 2013, ADAC, 2016) there are not many sustained initiatives to date. It seems that also here some public strategies are needed. To cite the dilemma Beetz, Huningh and Plieninger (2008); "*For reasons of cost-efficiency, infrastructure is commonly adapted in a purely quantitative manner to demographic change, for example by a reduction of school locations according to decreasing pupil numbers. With decreasing accessibility, the quality of life of locals aggravates. In the face of an inflexible regulatory framework and decreasing public budgets (and willingness to pay), this process is very likely to continue in the near future. Still, rural areas require specific solutions with the necessary flexibility, cooperation, self-help and multifunctionality in order to keep up a certain standard of living and to empower local and regional actors to find creative new paths".* With Muschwitz and Reimann (2015) I would like to conclude that to stop the downwards spiral a strengthening of mobility and service provision independent of car solutions seems needed, a strengthening that can act as a key for sustained service provision in these rural areas and villages.

## 4.4 Transport disadvantage in the rural areas of the developing world.

Transport disadvantage is very important in the rural areas of Africa, Asia and Latin America. Lack of infrastructures and lack of transport services leads to great accessibility problems. At first , especially in Africa, in getting the essentials for living, water and firewood. And secondly, in all three continents , in reaching education, health care and markets for products. Transport constraints are seen as major impediments to improving the availability of rural health and education. In this respect it is rather strange that the former Millenium Development Goals excluded transport from their primary list of objectives (Bryceson, Bradbury and Bradbury, 2008). Five of the eight goals were about health or education improvements, and many programmes depend on road transport. Faiz (2012) presents an overview of the relationships between these Milllenium Goals, transport and accessibility.

In many rural areas the quality of the road infrastructure is bad. In recent decades many investments have been made in building or upgrading rural roads. In fact, almost all budgets of donors, related to rural transport went in building roads (Starkey and Hine, 2014). I will analyse shortly the literature on the impacts of these investments in relation to transport disadvantage. Are the people facing transport

disadvantage, thus having to overcome great problems in reaching the locations and activities essential in their life, helped by these investments? First a description of the situation. The World Bank developed a so -called Rural Accessibility Index. On the basis of this index in the developed countries 94 % of the rural households live within 2 kilometres of an all- weather road, while only 37 % live within this range in the 15 poorest Sub Saharan countries. And globally, about 1 billion rural dwellers lack the two 2 kilometres access to an all- weathered road (Faiz, 2012). Poor transport makes a connection to economic markets problematic, as the delivery of goods just takes too much effort and too much time. In economic evaluations until recently this element dominated. Building rural roads, trails and bridges will in this respect benefit rural communities. The investments lead to overall poverty reduction, and are essential (Starkey and Hine, 2014).

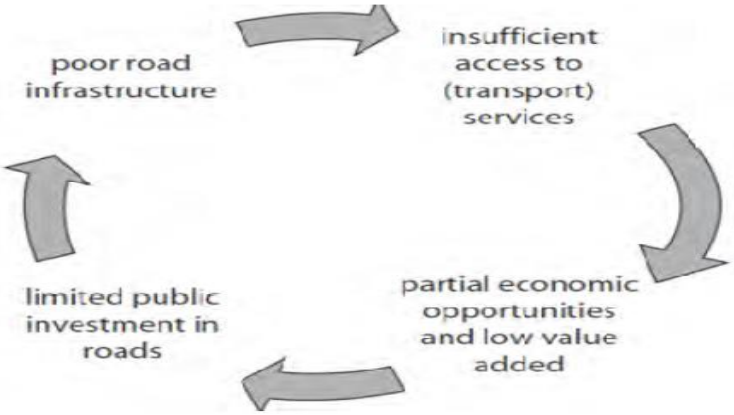
However, there is discussion on where to build or to upgrade these roads. As Sieber and Allen (2016) noted there is evidence from Ethiopia, Ghana, Nepal and Uganda that upgrading footpaths to basic roads provides greater benefits than upgrading existing roads to all- weather quality or building complete new roads. Locating investments can be done from different perspectives. From an equity perspective road building should concentrate in rural areas where poverty is most severe, from an economic approach road investments should take place where economic benefits can be maximised. This latter perspective seems dominant and is elaborated via ideas of "trickling down" the profits from economic players to the poorer parts of the population. When looking at the impact of road building on rural poverty in Ethiopia Terefe (2012) concluded that investing in road infrastructure related to agricultural productivity had been an indispensable strategy. But his caveat is that this does not necessarily imply that further investments in these road infrastructures will continue to have the same poverty reduction effects. Granados (2015) on Mexico is more critical, noting that huge investments in rural highway building did not diminish rural poverty, and that positive results were only to be seen in periods of economic contraction. Iimii et. al (2015) arrived for the Brazilian state of Tocantins to the conclusion that road building had positive effects for increased school attendance for girls, and far weaker but still positive effects on job creation or household incomes.

On a more generic level there is doubt about the "trickling down" -argument. To quote Raballand et. al (2011) : *"many investments in rural roads seem to be built on the assumption that they will lead to market provision of transport and thus to poverty reduction and income generation."* They consider this to be questionable. With better roads you do not immediately have better transport services. In a report of the GIZ (German Development Aid Organisation,2013) the assumption that when a good quality road is available the relevant transport services will immediately follow is nuanced by pointing out that in the more densely populated regions of Asia (like Vietnam or Sri Lanka) this seems to be the case, but that the situation is more difficult in rural areas characterised by a combination of relatively low population density and very low incomes as is often found in African countries. Here, the creation of transport services that are cheap, safe and is still problematic.

Seen from a transport disadvantage perspective in these areas a focus on road building or upgrading road from more economic frames could lead to empty roads, only used by the few entrepreneurs that get an entrance to broader markets and have individualised transport available.

Equity issues are at stake here. Starkey and Hine (2014) argue that investments in feeder roads are for most rural areas more cost – effective than investments in gravel or tarmac roads, or in building highways. Banjo, Gordenson and Riverson (2012) emphasised in their World Bank review of rural transport investments on the lower end of the rural road network – community roads, paths and trails- in order to meet the rural access and mobility needs. It looks that the situation is as follows. In many rural areas in Africa people are too poor to pay for transport services, and transport services are difficult to organise. These people are really helped by better roads immediately from their houses, so that they can walk faster and with greater ease to services for education or health care. There is here probably a conflict between two transport disadvantaged groups, as the richer farmers can escape their transport disadvantages through investments at the higher end of the road spectrum.

No regret is to organise rural road building and upgrading jointly with creating transport services, to get out of the transport trap in rural areas, as envisioned by IFTRD (2009).




Transport services do not automatically materialize after road construction (Rammelt, Leung, 2017). The rural poor still have enormous access hurdles, as they cannot pay for transport services. As Porter (2012) signals : *"it is still extremely common across West Africa to see women trekking with heavy loads along heavily trafficked paved roads because they cannot afford to pay transport fares".* Speed can be very important in reaching schools, but especially in reaching health care as transport infrastructure and transport services are essential to overcome the potential fatal "three delays in health care"; the decision to seek health care, the travel to reach health care, and the treatment within the health care system (Sieber and Allen, 2016). Organising appropriate transport service is not easy as Raballand et. al (2011) show. Subsidizing a daily bus service in low density rural areas is costly, and competition between providers will not exist, as even a provider with some subsidy cannot break-even. As Porter (2012) mentions, only when roads are improved to all weather standards, competition could rise. On transport services there are great differences as Bryceson, Bradbury and Bradbury (2008) showed comparing Zambia, Ethiopia and Vietnam. Ethiopian villagers did not have the preconditions in terms of money and missed the degree of organisation to take advantage of the potential of road improvement, while the Vietnamese could profit. Vietnamese villagers could move quicker on their walking and biking trips, and could use transport services that became available thanks to road upgrading. In Ethiopia villagers could also move quicker on their walking trips, but were unable to afford the growing, but still scarce, transport services. Zambian villagers had intermediate positions.

Thus, people with the greatest transport disadvantage are often not the main beneficiaries of major road investments projects because the relation between providing roads and providing affordable transport services tends to be forgotten by donors and planners. Starkey (2016) presents an overview of the rural transport services. Many different vehicles can be used, and passenger trucks seems more realistic than busses. In recent years the motorcycle taxis have grown in importance, as this vehicle can overcome some worse road conditions. However, taxi drivers drive often too fast, creating safety problems (in seven Nigerian states motorcycle crashes accounted for 54 % of all road- traffic injuries, Porter, 2014), and motorcycle taxis are not very cheap, meaning that among the poorest people using motorcycle taxis is limited to health emergencies (Porter, 2016). The transport service sector is often a "free for all"- sector with little regulation and elements of corruption. In many rural areas we are still far away for qualitative good provision of transport services. Under conditions where transport is rather undependable and unpredictable, people cannot plan their mobility and are losing costly time in just waiting. While investments in roads are high, investments of donors and governments on rural transport services are low or even non- existent (Starkey, 2016).

There is also another element that makes assumptions on automatic progress in poverty reduction through rural road building and upgrading questionable. Access to the land will be a key element in how far rural households can benefit, and in a number of countries this access is very unequal (Wondemu and Weiss, 2012, Porter, 2012).

*Elements of power, inequality and gender* are important in most rural areas in developing countries. Gender is an issue in transport in developing countries. Women spend more time travelling on slower transport modes then men, and significant higher percentages of walking trips are made by women. Women are responsible for the daily chores, and this includes in many countries all trips to get water and firewood.

When a vehicle is available in a household it is mostly the man that uses it. Boys are not doing very much, but girls have to help their mothers before they are able to walk to schools. They are strongly constrained in their journeys to school, by parental concerns over their safety, but also by cultural norms asking them to do the greater part of domestic work each day. This often creates problems in coming too late in school (Porter, 2007, Porter et.al. 2010). Time poverty in rural areas is a problem for girls and women, and not that much for men and boys . For example, in Sub- Saharan Africa women account for 70 % of household labour and for 85 % of household daily effort spent on transport (Uteng, 2011). Women have specific needs on appropriate transport, such as safety, easy access to health care, and fitting in their time schedules (Zogo and Epo, 2016). When a household can afford this, the motorcycle taxi, the bicycle but also the mobile phone can bring some relief (Porter, 2014). Transport is also a major hurdle for the elderly (Porter et.al, 2013) and for the disabled (Ahmad, 2013), who both need better quality of transport services than offered. From the literature it seems clear that the worse situations can be seen in Sub-Saharan Africa, with lesser problems in most parts of Asia and Latin America.

It seems that in many rural areas in developing countries the individuals that are most mobile are often also the ones that also have to face the greatest transport disadvantages. To diminish transport disadvantage in the developing world coordinated investments are needed on three related domains; rural road upgrading and maintenance, creating transport services, and fighting inequalities in power and gender. Only then, transport disadvantage leading to bad access to education, health care, and markets can really diminish.

# 5 Transport disadvantages in geographical perspective; some first conclusions

In this chapter I presented through many different stories an overview of transport disadvantages from a geographical perspective. Going through these stories again it is safe to conclude that three groups have a greater inclination towards transport disadvantage:; *the adolescents, the elderly, and especially the disabled*. The potential of being involuntary transport disadvantaged grows in moving from cities to suburbs, to peri-urban areas and to rural areas. In cities transport disadvantage is primarily related to evenings, early mornings and nights, to biased public transport networks and to specific urban forms. For all the other geographical areas *the lack of delivery of public transport* at (almost all) times of the day is a great source of involuntary transport disadvantage. Routing, time scheduling and pricing of forms of public transport are very important elements in explaining involuntary transport disadvantage, especially in combination with great distances to overcome and low population densities.

Transport disadvantage is for most households with members in ages 25-65 years of age related to owning a car, or better, to having a driving license. *Without a car or a driving license there is the potential to be trapped or stuck in your place of residence,* and thus being confronted with the same situation as adolescents, elderly or disabled persons. Many poorer households decide to buy a car or get a driving license, but this can lead to car related *economic stress*. Economic stress can also for non-car households be a result of inappropriate routing of public transport, as one has to pay huge amounts for public transport services.

It seems that the situation that many individuals and non- car households cannot get easy access (in suburbs), or even no access at all (in peri- urban areas, in rural areas) to shops, health care, friends, leisure, at most hours of the day is more or less taken for granted, and seen as a responsibility of the family (parents for adolescents, children for the elderly) or even of the community, hoping for some community solidarity.

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