EQUITY IN TRANSPORT PLANNING
ARE WE ASKING THE RIGHT QUESTIONS?

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ABSTRACT

Equity in transport planning reduces the accessibility and mobility deficit towards disadvantaged people. The idea of transport justice generally denotes the fairness with which transportation impacts (costs and benefits) are distributed, transport policies are equitable if they favour economically, socially or mobility disadvantaged groups, therefore compensating for overall inequities (Litman 2014:50-51).

Redressing the inequalities of the apartheid land-use and transport policy requires deliberative planning. In an unequal developing society, like South Africa, it is important that the injustices that are highlighted by transport corridors are rectified with knowledge and understanding. Public participation and cross-pollination between various departments, business and civil society improves knowledge of the extent and forms of injustice. Transport planning for equity considers an expansion of the traditional four-step model to improve accessibility and mobility of the vulnerable and disadvantaged.

A simplified example of the application of Marten's proposed rules of transportation planning using justice principles (Martens 2017:174) is explored for a vulnerable urban worker. Then a proposal of questions to ask in planning process is presented. The success of any intervention that fosters equity and operational transport justice requires a shift from current practices.

1. INTRODUCTION

The notion of equity is rather convoluted and has sparked complex theoretical debates among scholars, policy analysts and policy makers. Jennings (2015:765) makes a distinction between horizontal and vertical equity (also referred to as fairness and egalitarianism). She posits that horizontal equity is mainly concerned with the distribution of impacts between individuals and groups regarded equal in ability and need while vertical equity pertains to the distribution of impacts between individuals and groups that vary in abilities and needs, for example by income or social class (also referred to as social justice, environmental justice and social inclusion) or in transportation ability and need (known as universal design).

This distinction between horizontal and vertical equity implies that transport policies are equitable if they favour economically, socially or mobility disadvantaged groups, therefore compensating for overall inequities (Litman, 2014:51). It can therefore be deduced from Litman's view that progressive policies favour the disadvantaged groups while regressive policies excessively burden disadvantaged people. This in essence implies that equity in transport planning reduces the mobility and accessibility deficit towards disadvantaged

people. The realisation/effective implementation of equity in transport planning necessitates a deliberate exercise of transport justice.

This paper first explores the idea of transport justice. Secondly, it analyses the South African urban transport conditions using the forecasting process. Thirdly it explores a simplified agent-based application of Martens (2017:23) justice principles based transport planning process. Lastly it proposes questions to pose in pursuit of equity in transport planning.

2. TRANSPORT JUSTICE

The idea of transport justice generally denotes the fairness with which transportation impacts (costs and benefits) are distributed (Litman, 2014:50). According to Martens (2017:13), transport justice develops a new paradigm for transportation planning that draws on social justice philosophies arguing that governments have the fundamental duty of providing virtually every person with adequate transportation thus mitigating the social disparities that have been created over the past decades. The National Transport Master Plan 2050, NATMAP 2050 promotes accessibility (both on distance to transport options and universal accessibility) (DOT, 2016:1-5). Martens (2017:18) argues that even a combination of planning for sustainability and accessibility does not satisfy transport justice.

Transport plans document the projected interaction between people, activities and the land. Some urban transport problems such as congestion, pollution, and clogged transport infrastructure are results of unabated private car-reliant development. Over the decades a more sustainable approach that tackled some of the adverse environmental effects of transport provision (eg. pollution) was adopted (Owens, 1995:48) yet it fell short of providing for access and this was still considered unfair. This necessitated the advent of transport planning for accessibility which in this paper limited to questions of affordability, proximity and availability.

Conducive conditions for transport planning justice include acknowledging that people's movement or lack thereof is a result of various factors. Martens and Golub (2011:10) maintain that accessibility cannot only be viewed as a resource challenge, where infrastructure-based and distance measures determine best practice; nor a welfare issue, where utility or space-time measures are used. They propose that accessibility is a midfare challenge where both infrastructure and personal circumstances are assessed (contours potential accessibility and space-time). The NATMAP 2050, (DOT, 2016:1-5) which aims among other things to improve mobility and access informs provincial and municipalities long-term transport plans.

Transport planners have, at best, applied industry standards and stakeholder engagement in developing transport solutions. However, there are still outcries about the lack of transport justice raised in various protests and lobby from members of the public, public transport operators, labour unions and the business community.The Opposition to Urban Tolling Alliance (OUTA) v The South African National Roads Agency Ltd (ZASCA 148, 2013:par31) is one such example where individuals and businesses challenged the tolling system of Gauteng freeways. One of the reasons cited by the deputy chief justice was that the case was presented five (5) years into the tolling system, showing that even at the advanced stage of the implementation there was dissatisfaction.

Martens (2017:23) proposes that the informal rules of traditional transport planning be upgraded to the rules of transport planning based on principles of justice (figure 1, below).

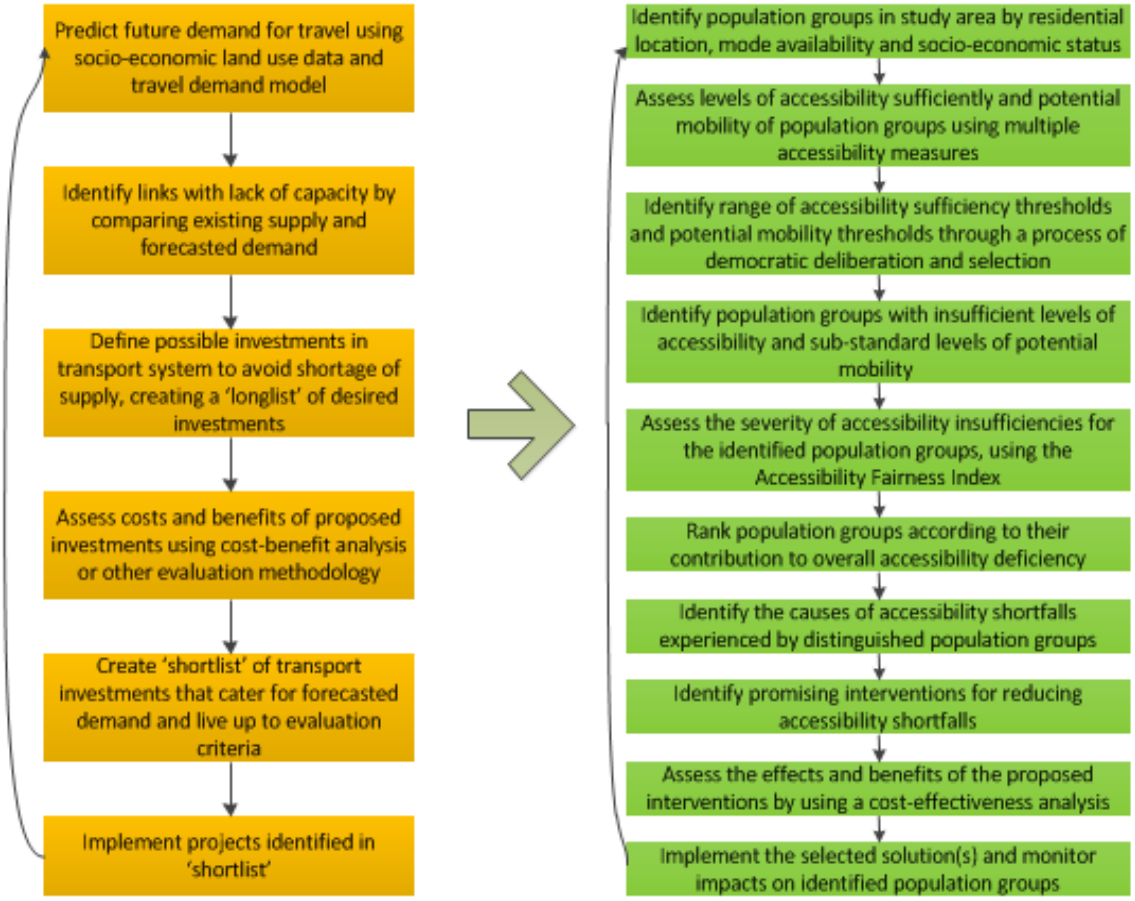

Figure 1: Adaptation of Martens' transition from traditional to justice-conscious transport planning

Figure 1 is developed from Martens (2017:23) "The informal rules of traditional transportation planning prescribing how to conduct 'proper' transportation planning" and Martens (2017:174) "The rules of transportation planning based on principles of justice"

Similarly, as the traditional transport planning process is iterative, so is the justice-conscious option. The justice-conscious transport plan acknowledges the contribution of a shortfall in accessibility of one population group is an adverse effect for all population groups. The justice-conscious approach follows a more human-centric approach to transport planning.

3. SOUTH AFRICAN URBAN TRANSPORT CONDITIONS

The South African urban transport conditions will he analysed using the overall forecasting process by Beimborn et. al, (2002:7). The conventional transport plans are aimed at predicting and providing for future needs consists of interrogating land use, predicting travel using the four-step travel-demand forecast model and assessing the impact of the transport on land use (see Figure 2). These projections require accurate statistics, knowledge of land development plans and some prophetic abilities.

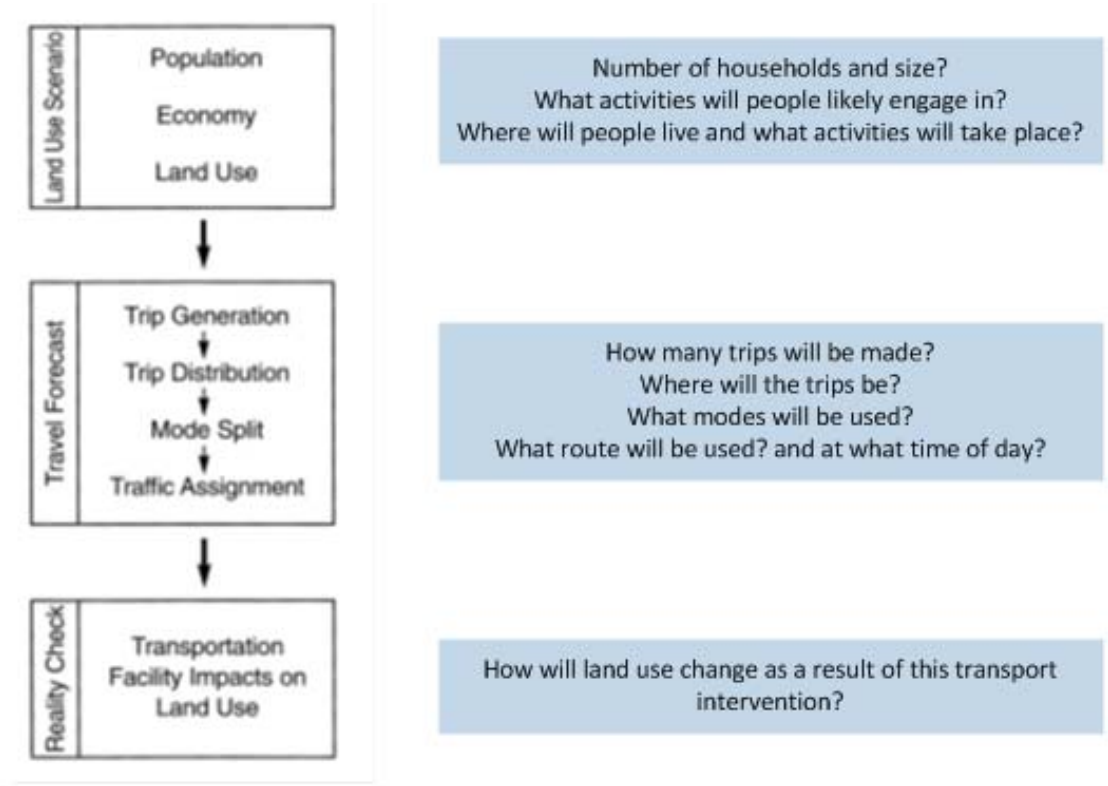

Figure 2: Adaptation of Beimborn's Overall Forecasting Process

The conditions to respond to the questions attached to the land use scenario, travel forecast, and reality check subgroups are explored below.

3.1. Land use scenario

The base year information for number of households and size can be sourced from the Statistics South Africa (StatsSA) data (census, community surveys, and household surveys).

The expected activities (educational, recreational, work or business) are captured in StatsSA publications. The observed reliance on salaries, wages, commissions (57.9%) and social grants (21,3%) for the South African Households (StatsSA 2016:58); the 26.7% fourth quarter unemployment rates (StatsSA 2018:11) hint at the necessity to harness enterprise development. According to Cities Alliance (2006:3) developing cities do not absorb the urban labour force, therefore entrepreneurial and small business support (incl. informal sector) is imperative for livelihood enhancement. Emanating from the above statements, it is important to consider how the informal sector may impact activities of the area. The nature of this sector is knowledge that usually vests with multiple stakeholders. The planned transport infrastructure and services must account for these needs (either by appropriate Transit Oriented Development (TOD) nodes, provision for both motorised and non-motorised transport infrastructure) unlike some older low-income South African locations and newer developments that have solely provided roads for one car movement and no space for pedestrian or other non-motorised transport movement, or even sidewalk trading. This urban form is not responsive to this entrepreneurial future.

There is also an observed densification (formal-traditional structures and informal shacks) trend in low-income communities that can be anticipated and factored in the forecast and scenario development (Govender et al 2011:25). If planned for, the metamorphosis from the current commute intensive home-based-work, home-based-education or home-based-other

trips development to a live-work-play development will reduce the accessibility deficit for the low-income communities. At present the better determinant of travel demand, is the trip attraction (work). In Cape Town, as in most South African Cities, the affordability of long commute negatively affects accessibility work opportunities and other activities for low-income communities in distant areas (Imuentinyan et.al., 2016). There are developments (estates and multi-use gated communities) that have a successful trip suppression outcome; they are mostly not for the urban poor. However, coordinated policies (zoning, economic, residential and transport development) can vary the choice of business establishment, provided the company does not have a priori preference of a location far from residential areas (Levy et.al, 2011:12, Owen 2015:48, Moeckel et.al, 2017:29)

A multi land-use approach for scenario scoping should be taken, however not naively because the affordability and purpose of the trip are a greater predictor of travel demand than land-use.

3.2. Travel forecast

Trip generation is a function of the population, trip purpose, distance and available modes (Beimborn et al. 2002:15). According to South African National Household Travel Survey (StatsSA, 2014:1), “Most learners, who attended pre-school, school, ABET and literacy classes walked all the way to reach educational institutions. Those attending higher educational institutions tended to use taxis more than any other mode of travel. As far as workers were concerned, nearly four million of the 15,2 million workers drove all the way to work using private transport, whilst 3,7 million used taxis. A further 3 million walked all the way, and approximately 1 million made use of buses as their main mode of transport”. Furthermore the Statistician General highlights that over and above the increased reliance on transport and its efficiency, there are some disutilities in the form of infrastructure condition, excessive travel time, safety and affordability. There are also challenges of unavailability of transport at different times affects travel forecast for the low-income communities (who are mostly captive public transport users). The recent bus strike and deterioration of passenger rail has led to choice users, those who have alternative transport solutions, churn to passenger cars (Mahlakoana, 2018). According to Saleh et.al (2006:693) “asymmetric pattern of churn can be said to be gross changes in the travel behaviour of individuals that not being equal and opposite result in a net change in aggregate travel behaviour”. The desired shift to public transport is less frequent, previous use of public transport does not automatically predict a return to public transport once it is improved (Bamberg et.al, 2003:186). Therefore Considering the dominant public transport mode for captive users (taxis) and the trends of the informal passenger car taxi services and their prevalence in some townships, it may not be too far from the rise of a motorcycle taxi industry (like in North African states) to account for route flexibility which is lost in the scheduled bus services and route specific taxis in areas that are underserviced or experience mobility and accessibility deficit. Motorcycles further have the operational advantage on congested routes.

3.3. Reality Check

Transport interventions alter land use. Zoning can be applied as a remedial action.
Martens (2017:230) argues that “even though transport planning using justice principles may reproduce injustices, in some domains, this is not proof that it is doesn’t work but that it takes more than transport justice to attain a just society.” This is because transport is a derived demand therefore transport corridors serve as conduits of social conditions (health, economic, safety and security etc.). Both traditional transport planning and transport

sustainability models use existing patterns to predict future patterns and thereby not correcting existing injustices (eg. land-use, affordability of transport etc.) (Martens 2017:18).

Kane and Del Mistro (2003:120) have also explored a transport planning model that includes social and political decisions. Transport justice esteems the view, experience and needs of all stakeholders. The framework adopted by the integrated urban transport planners mixed land use, non-motorised transport and public transport are prioritised and planned for above private car. Though there wasn't great uptake of the model, it is a forerunner for deliberative transport planning.

Although these implied discussions may have delayed outputs, they produce comprehensive plans. These plans are however limited in their estimation of personal circumstances of population groups. Adding Social Development, Community Safety, Education and Civil Society into the conversation would be ideal.

In South Africa, it may be time to merge traditionally technical ministries with social ministries to leverage knowledge systems and attain transport planning justice. At metropolitan municipality level the merger has started (e.g. Cape Town's Transport and Urban Development Authority).

4. A SIMPLE EXAMPLE OF AGENT-BASED JUSTICE-CONSCIOUS TRANSPORT PLANNING

To illustrate a possible application of Figure 1's transition to justice-conscious transport planning a South African urban transport scenario is explored.

Transport planning occurs at an aggregate level, however to demonstrate the steps an agent-based example is used. Consider Lethu, a woman in Travelling Analysis Zone (TAZ) X (a low-income area). She works as a domestic in a high-income area called, TAZ Y and relies on public transport TAZ X is 30 km from TAZ Y. Also consider another woman, Mali, who lives in TAZ Y. Mali has access to a family car and has a high-income job and employs Lethu.

Step 1: Identify population group – Group 1 is represented by Lethu, and group 2 is represented by Mali.

Step 2: Assess levels of accessibility and mobility – Lethu is a public transport captive and resides (TAZ X) within 1 kilometre from the main road and train station. The path to the train station is through an unsafe field therefore only road based transport is an option.
Mali resides 3 km from the freeway and main road which is more than 1 km from any rapid transport mode or feeder route (goal set in the NATMAP 2050). This does not disadvantage Mali because she has an alternative mode and flexi-work conditions. However it affects Lethu's egress time, she disembarks along the freeway because the taxi route does not go through TAZ Y.

Step 3: Identify a range of accessibility and mobility thresholds – For Lethu, in TAZ X safety for vulnerable groups to and on the train (the most affordable mode) is a great concern. In TAZ Y proximity to public transport routes is a concern. Between TAZ X and TAZ Y reduced travel time is desired, however the increased single occupancy vehicles from TAZ X to various TAZs reduce the mobility index. Therefore, Lethu has acceptable mobility (between TAZ X and TAZ Y), while accessibility at destination (TAZ Y) is unacceptable.

Step 4: Identify population groups with insufficient accessibility and mobility levels: Both Lethu and Mali have equal levels of mobility (traffic congestion affects the whole city) however Lethu has insufficient accessibility at destination.

Step 5: Use the Accessibility Fairness Index – TAZ Y has a greater accessibility shortfall but the adversely affected population group is from TAZ X (Lethu).

Step 6: Rank population group in accessibility shortfall – Lethu remains at a greater disadvantage due to lack of safe access to the train and egress time.

Step 7: Identify the causes of accessibility shortfall – Under development of land near the station, lack of safety and security near the station, lack of safety and security on the train, segregated spatial planning, lack of public transport through TAZ Y. These are a mix of land-use, safety and transport shortfalls.

Step 8: Identify promising interventions for reducing accessibility shortfalls – Develop an intervention logic per shortfall, consider confounding factors and scope of improvement. For Lethu it could be: fencing off the open field (unintended consequence would be a longer walking route, being trapped on the path with a potential aggressor); improving safety and security on the train (if no intervention is made for the field, the train remains inaccessible); providing a scheduled feeder service through TAZ Y (user and state cost implication, regulation and land-use changes).

Step 9: Assess the effects and benefits of interventions using cost-effectiveness analysis – Proxy effects and benefits presented in step 8.

Step 10: Implement the selected solution and monitor impacts on population group – conduct site observations and periodic interviews with Lethu and Mali.

Lethu and Mali could be aggregated to their respective TAZs. Their interactions could be mapped on a trip origin-destination matrix for improved transport planning equity. Justice for the population group with the greatest accessibility deficit depends on the accessibility measures explored.

5. CONCLUSION

If the historic provision of transport has perpetuated an unequal society and decades later the imagined future is still under construction. The transport planning process is in need of some philosophy. In implementing the transport justice philosophy I propose that we start asking the following questions:

- Who is in accessibility and mobility deficit?
- What are the compounding factors the observed deficit?
- Which role-players are necessary to levelling the transport justice scale?
- What constitutes our accessibility fairness index?
- How do we determine cost-effectiveness in transport justice?
- How do we make trade-offs between degrees of deficiency?
- What do we stand to lose if we do not change our ways?

These questions could lead to equity in transport planning.

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