RELATIONSHIPS BETWEEN RESIDENTIAL RELOCATION, TRAVEL BEHAVIOUR AND HOUSEHOLD AFFORDABILITY: THE CASE OF THE ROODEPOORT REGIONAL NODE IN JOHANNESBURG

R KHOZA* and R BEHRENS**

Centre for Transport Studies, Department of Civil Engineering, University of Cape Town;
Email: *khoza.rhandzu@gmail.com; **roger.behrens@uct.ac.za

ABSTRACT

Households must often trade-off amenity, accessibility, and affordability in their residential and travel decisions. Little research attention has been given to how these trade-offs are made amongst lower income households in South Africa, the nature of relationships between neighbourhood relocation, housing affordability, and travel aspirations. The aim of this paper is to investigate relationships between travel patterns, household expenditure, and residential relocation, in the Roodepoort Regional Node, a social housing development scheme in Johannesburg with walkable mixed land-uses and close proximity to public transport services. The research method involved qualitative retrospective mobility biography interviews of 31 residents. The findings indicate that the relocation to Roodepoort was motivated by varying combinations of: housing affordability; change in family structure; proximity to facilities; activity spaces; employment opportunities; and access to transport. The relocation yielded a change in travel behaviour for the majority of the study participants. It was found that relocation can result in benefits such as proximity to transport and saving money and travel time. The findings demonstrated, however, that being located in a public transport-friendly node does not necessarily result in the participants using public transport.

1. INTRODUCTION

Housing and transport are the two largest household expenditure items in South Africa (STATS SA, 2017). Mattingly and Morrissey (2014) argue that the current housing affordability paradigm is dismissive of transport cost, which is a relatively large portion of household expenditure. Housing location continuously influences ongoing transportation costs. The lower housing prices in outlying urban areas are often offset by high car dependency, long travel distances, and the associated cost of fuel (Mattingly & Morrissey, 2014). Research has illustrated that not more than 30% of household income should be allocated to housing cost, if greater than this, it is unaffordable (Welch, 2013). The combination of housing and transport cost should not be greater than 45% of household income according to Dewita et al. (2018), therefore it can be assessed that transport costs should not exceed 15% of household expenditure (Gauteng's mean household transport expenditure is 16%, STATS SA, 2017). For housing to be considered affordable, a resident should have the ability to obtain and pay for appropriate housing without experiencing undue financial hardship.

Scheiner and Holz-Rau (2012) posit that migration behaviour, employment opportunities, and change in family structure are some of the core reasons for a change in travel behaviour. Once an individual or household decides to relocate due to the above, the

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selection of the location is based on a trade-off, that Welch (2013) explains as the trade-off between housing cost, greater access to public transport, or greater access to places of opportunity, such as employment. It is likely, that the mode of transport has often changed after residential relocation (Scheiner & Holz-Rau, 2012) and that the possibility that an individual would choose to live in a particular area based on their access to transportation is high according to Scheiner & Holz-Rau (2012).

Minimal research has been undertaken in South Africa in understanding household expenditure, travel behaviour and residential relocation for residents of a social housing scheme in a node. Lanzendorf (2003) explains that decision making is best understood through mobility biographies and mobility milestones, thus this paper will adopt the approach in understanding the influences on travel behaviour. Typically, Venter (2011) explains that the relationship between housing and transport, travel behaviour and residential relocation is focused on low-income households that reside on the urban fringes of the City. This research introduces a dynamic layer by focusing on the decision making of low-middles income groups residing in proximity to the City Centre.

The research seeks to understand the relationship between travel patterns, household expenditure and the influences of residential relocation for residents of a social housing scheme in a regional node. The City of Johannesburg (2008) explains that a node is a location of concentrated activity associated with employments opportunities and high-density residential development located on a mobility spine. The assumption in the research is that the residents have a locational advantage by being located in a transport active node, have access to public transport and are able to reduce their transport expenditure (Lucka, 2018). The assumption is made on the basis that a node is a compact development that is self-sustaining neighbourhood, where people can use none-motorised transport and increase their use of public transport (Lucka, 2018).

The paper is categorised into thematic areas that seek to understand the rationale behind people moving into a social housing development and the impact thereof. The study aimed to achieve the following:

- To understand travel patterns of the residents.
- To understand the travel behaviour of the social housing residents.
- To explore the relationship between transportation and housing decisions.
- To determine the impact (beneficial and non-beneficial) of residing in affordable housing in a regional node in proximity to the City Centre of Johannesburg.

The paper consists of five sections. In the following section, the context of the social housing development in Roodepoort is introduced. Section 3 describes the research method employed in the study. Section 4 presents the study theoretical understanding and findings. Section 5 discusses results and draws conclusions.

2. CONTEXTUAL BACKGROUND

The City of Johannesburg, Spatial Development Framework (2016) encourages high residential development in proximity to economic opportunities and public transport. Social housing units are often developed in well-located areas (or 'restructuring zones'). The social housing model emerged to encourage developers to supply and manage affordable rental for low-income earners. The developers receive a grant on the provision that 30% of the units are allocated to households earning between R1 500-R3 500 per month; 70% of the units are a combination of households earning between R3 501-R7 500 and

R7 501-R15 000 per month. The Social Housing Regulations state that gross rentals or levies per unit operating cost cannot be greater than 33% of monthly household income (Tissington, 2013).

Roodepoort regional node is located northwest of the Johannesburg City Centre (see Figure 1). The node is an economic hub (City of Johannesburg, 2008), that promotes mixed land-uses, development of a public environment that consists of pedestrian connections and the development of accessible transportation (City of Johannesburg, 2008). In an 800m buffer of the social housing development, the residents have good access to public transport facilities that are inclusive of minibus-taxi ranks, a railway station, and bus stops, as well as access to restaurants, the retail strip that is characterised by informal trading, grocery shops, banks and clothing shops and public facilities such as the clinic and licensing department (City of Johannesburg, 2008).
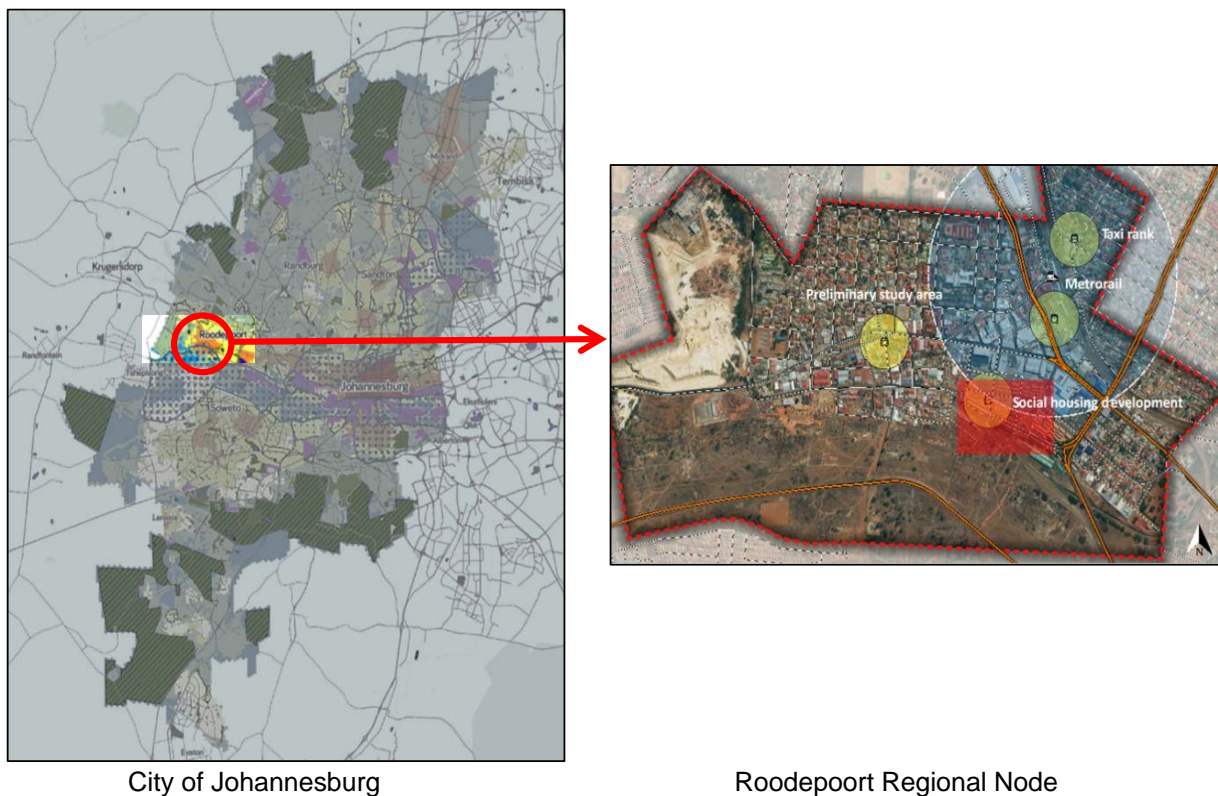

City of Johannesburg   Roodepoort Regional Node

Figure 1: Location of Roodepoort regional node and social housing development

3.   STUDY METHOD

The research method employed a retrospective qualitative and quantitative survey. A sample of 31 social housing residents were interviewed in their homes. The format of the interviews sought to gather information on travel behaviour, mode choice, residential relocation, household expenditure, and transport cost. The methodology was applied to enable participants to take a historical view on the changes their households went experienced during residential relocation (Lanzendorf, 2003). The outcome of this approach is considered reliable because it requires the participants to only recall a memory that they have directly participated in. Before data collection commenced, the Johannesburg Social Housing Company was informed of the study in order to gain access to the social housing development to interview the residents. Pilot interviews were

undertaken to determine if the interview questions needed to be modified. In the final study, respondents were audio recorded on a Sunday as a preferred day by the respondents to conduct interviews.

4. THEORETICAL UNDERSTANDING AND STUDY FINDINGS

4.1 Elements That Influence the Experience of the Residents

4.1.1 *Theoretical Understanding of the Influence of the Built Form on Mode Choice and Travel Behaviour*

Considerable attention in recent years has been given to designing cities with the objective of reducing car use and travel distances, by creating neighbourhoods that encourage walkability, a mixture of land uses, a variety of housing types and grid street patterns that enable greater connectivity (De Vos et al., 2014; Khattak & Rodriguez, 2005; De Vos & Witlox, 2016). The design of neighbourhoods in this manner is to ensure that car use declines, thus making non-motorised transport an attractive alternative (Cervero & Radisch, 1996). Cervero and Radisch (1996) argue that the built environment has a direct impact on travel mode. The urban density and proximity of residents to the central business district decreases the anticipated average household vehicle per kilometre travelled. Commuters that reside in such neighbourhoods continue to use their vehicles to go to their favourite restaurants, shops or visit friends or family outside of the neighbourhood (Lerner-Lam et al., 1992), demonstrating that internal walk trips do not replace vehicle use but rather are in addition to external driving trips in mixed-use developments.

The decision-making process plays a vital role in the selection of transport mode, movement patterns based on the character of the built environment, socio-economic status of the trip maker and the traits of the trip. Given these elements, decision making according to Jeng and Fresenmaier (2002) is a complex process because it is routed in multiple concepts, therefore, it is a multifaceted behaviour concept that includes sub-decisions. It is argued by De Vos et al. (2016) and Jeng and Fresenmaier (2008) that attitude and preference are cognitive components which determine the travel mode choice. Bamberg et al. (2003) elucidate that past behaviour can be a great influencer of future behaviour which forms part of the behavioural decision process. The behavioural decision-making context is based on information that an individual holds such as transport costs or the design of the built form. In addition, decision context is the ability for an individual to make travel decisions based on ethnicity and sociodemographic (Jeng and Fresenmaier, 2008). Thus, the travel behaviour of the commuter is based on a series of calculated decisions that the commuter makes. Crane (2000) explains that there are multiple factors that influence mode choice through decision making such as household income that translates to different travel patterns. In addition, it is noted that the built form may also influence travel patterns and mode choice.

4.1.2 *Research Findings*

The Roodepoort Regional Node is described as walkable with short blocks, designated pedestrian walkways and a variety of activity spaces by the City of Johannesburg (2008). The findings give a description of how the residents travelled to the various activity spaces (shopping or banking, social facilities and leisure facilities) and the preferred mode of transport. For the participants to get to the various activity spaces, they select their mode choice based on attaining a set of objectives (Schwartz et al., 2011). The objective for the participants is to ascertain goods and services conveniently see Figure 2 for Roodepoort regional node zones. Given the proximity of these services to the social housing

development, the most preferred mode of choice is walking. For those that use activity spaces outside of the node, the respondents drive or use minibus-taxi. For work trips, those that work in the Roodepoort node, walk to their place of employment. Whilst respondent that work outside of the node use a variety of modes such as minibus-taxi, private vehicle and a lift club.

Figure 2: Roodepoort regional node zones

Understanding travel patterns on a workday is best for illustrating the travel behaviour of the respondents because it shows a consistent travel routine. The travel behaviour of the respondent may change if an unexpected event occurs on the trip. Alternatively, a factor that may alter the consistent travel pattern is when participants undertake a different activity during lunchtime or after work (e.g., going to the gym). The respondents would rather repeat an activity pattern that offered them a satisfying experience without considering the details of the alternatives for work trips.

Decision making is based on complex layers that an individual is required to rationalise based on their experience (information gathered) therefore influencing the travel pattern and mode choice. The findings demonstrate that participants use minibus-taxis as the main mode of commuting to avoid 'bad experiences' such as being stuck in traffic and strikes, or it is simply the preferred mode of transit. Minibus-taxi is the preferred mode because it is convenient for commuting outside of the node, but for areas that are considered to be too far, the household members prefer to use their private vehicle. As an example participant 4A demonstrates the complex travel decisions that she makes on a work day by using what she considers as the most convenient and affordable mode of transport.

"I wake up at 5 am. I leave the house at 6 am. I work in Midrand and my daughter goes to school in Rosebank. We walk to rank 5 and catch a taxi to Rosebank. We arrive in Rosebank at 06h50. From there I catch a taxi to Midrand and I arrive at 07h15. At lunch time I catch a taxi to Rosebank to pick up my daughter and we go back to my workplace in Midrand. From there, I leave work at 17h00 and we arrive home at 18h30". 4A.

4.2 Residential Relocation

4.2.1 Theoretical Understanding of Residential Relocation and Residential Self-Selection

In residential self-selection Cao et al. (2009) explains that people select to relocate to neighbourhoods that align with their needs based on their preferences influenced by life circumstances such as travel requirements, employment, education, growth in the family structure, or immigration (Scheiner, 2018). Travel behaviour in the medium term is relatively stable but is changed by key events or experiences, in this case it is because of residential relocation. Relocating to a new environment is driven by events and milestones that are pertinent to an individual's travel behaviour (Farinloye et al., 2019).Van Wee (2009) notes that the motivation for self-selection in residential relocation can be related to factors such as activity schedules, travel modes, travel and driving behaviour, exposure to unsafe environments and impact of externalities. In addition, the accessibility and availability of a defined mode of transport is crucial for residential relocation. It was found in a study conducted in California that residential relocation was dependent on housing typology, cost and the quality of the neighbourhood as a deciding factor for individuals relocating to a transit-oriented development; whilst one-third of the participants in the study noted that the reason for relocation was access to public transport (Farinloye et al., 2019).

Scheiner and Holz-Rau (2012) suggest that the change in neighbourhoods does not always result in a change in travel mode and behaviour. Farinloye et al. (2019) explain that it is the combination of preference, attitude and the distance required to be travelled that may result in mode change. Rau and Manton (2016) found that the mobility milestones such as acquiring a driver's licence resulted in a change in mode use. In other cases, the introduction of government policy that promoted the use of non-motorised transport would influence and be the reason non-motorised transport increased. Therefore, Rau and Manton (2016) argue that mobility milestones are influenced by government policy, regulation and infrastructure provision that may influence mode use after residential relocation. Such policy changes are seen in the City of Johannesburg through the Spatial Development Framework (2016) and Regional Spatial Development Frameworks (2008) that seek to promote the use of public transport and non-motorised transport. That is seen through the need to reduce sprawl by developing compact urban centre with public transit. De Vos et al. (2018) explain that relocation to compact, mixed-use areas can reduce vehicle use and stimulate active travel and public transport use.

4.2.2 Research Findings Residential Relocation and Residential Self-Selection

This case study demonstrates that the decisions made by respondents are based on life situations. The respondents have adapted and adjusted their travel needs based on the new environment that they found themselves in. The respondents deliberately relocated to the Roodepoort node because it holds a variety of public transport options such as the bus, train and minibus-taxi. Life events and/or milestones in the participants' biography were the greatest factor that influenced the residential self-selection process. The findings demonstrate that respondents relocated because of growth in the family unit, getting married and gaining independence outside of the family unit. A second thematic finding was that the respondents relocated based on employment opportunity and the proximity of the development to social amenities such as schools and social facilities. A third thematic finding relates to housing benefits such as safety and living in a bigger housing unit. A fourth area relates to affordability and availability of public transport. The tenants moved to the social housing scheme because it is a gated development; rental is cheaper and in proximity to public transport.

> "I moved here because it's cheaper and transport is closer and it's close to school. My previous residence was awkward …". 26A.

Before the relocation, the dominant transport mode use was minibus-taxi (see Figure 3). Since the relocation, there has been a transport mode use change based on affordability, the built environment, and the most convenient and efficient mode. After residential relocation, there is a decline in minibus-taxi and train use, and an increase in private vehicle use. Additionally, there is evidence of an increase in walking. A conclusion can be drawn that residents relocated to the Roodepoort social housing development which enabled them to save money to purchase a car.
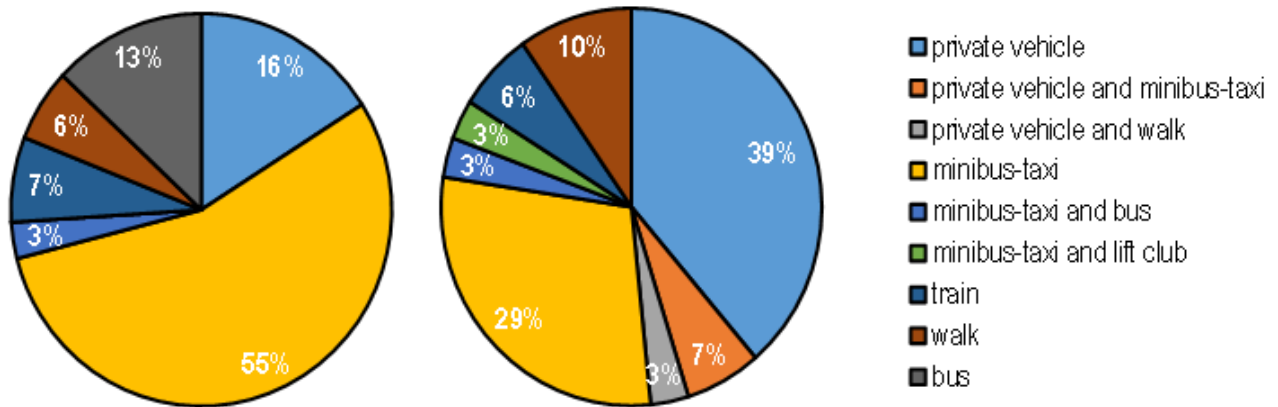

Figure 3: Mode choice before relocation (left) and after relocation (right)

4.3   Household Affordability

4.3.1 Theoretical Understanding of Housing and Transport Affordability
Dewita et al. (2020) argue that there is a research gap in understanding developing countries' spatial layout and the impact that this has on housing and transport costs. Venter (2011) explains that transport affordability is understood as the ability to undertake transport movement (journey to work, school, family and other social services) without hindering the ability to undertake other activities of importance. Dewita et al. (2020) explains transport expenditure as the financial burden that households carry to access transport, in a developing world context. Venter (2011) notes that low-income groups often associate transport cost with housing location choice. In multiple instances households are making trade-off between selecting affordable housing in less accessible areas, with high travel cost, or spending more on housing in highly accessible areas (Dewita et al., 2020). The City of Johannesburg (2016) explains that it seeks to transform the city by encouraging housing development for low-income households in proximity to transportation.

The Department of Human Settlements (2009) supports the development trend that is encouraged by the City of Johannesburg through the creation of what is known as restructuring zones and subsidies developers for social housing development. Restructuring zones are demarcated geographical areas targeted for investment based on the need for social, spatial and economic restructuring through social housing development (Housing Development Agency, 2013). The zones are designed to redress the spatial segregation and disadvantages created under the apartheid regime according to the Department of Human Settlements (2009). Thus, social housing makes provision for ensuring that marginalised, low-income households have access to economic opportunities, social facilities, and public transport. Secondly, social housing is a tool utilised to contribute to the housing sector particularly the rental market according to the Department of Human Settlements (2009).

The restructuring zones are said to provide locational affordability because the zones have public transport and affordable housing in a well-located area. Dewita et al. (2020) explains that location affordability assumes that any consideration of housing affordability must be supplemented by considering the transport cost incurred as a consequence of a location choice. The integration of transport cost and housing cost enable low-income households to select residential location that are closer to the city centre to decrease household expenditure and protect their solvency (Dewita et al., 2020). Howell et al. (2018) explains that low-income households are most likely to travel by public transport due to the limited access or no ownership to a private vehicle. Alternatively, low-income households tend to use non-motorised transit as a mode of transit thus reducing the need for private vehicle ownership (Howell et al., 2018). It is therefore emphasised that housing costs cannot be considered in isolation from transportation as these costs are determined by location because they often increase with distance to employment, educational and social activities (Coulombel, 2018).

4.3.2 Research Findings of Household Affordability

The participants explained their rationale for relocation to the social housing development. The primary reason for relocation was that the development offered affordable rental units. Given that the development is well located, it provides the participants with the opportunity to travel predominantly by non-motorised and/or public transport. However, the data showed an increase in private vehicle usage since relocations occurred. The data revealed that participants preferred private vehicle ownership, see Figure 3, mode choice before relocation and after relocation.

Nonetheless, majority of the respondents use public transport. The percentages of household income spent on transport was found to be high in comparison to housing expenses. Figure 4 demonstrates the percentage of household income spent on housing by the participants. It is noted that 86% of the participants spend 30% or less of their household income on housing. Fourteen percent of the participants spent more than 30% of their household income on housing. Once households use more than 30% of their household income on housing, the households are most likely to experience undue financial hardship. It is evident in the data collected that only a few of the participants are likely to experience financial hardship, thus indicating that the social housing development is affordable housing for most of the participants.
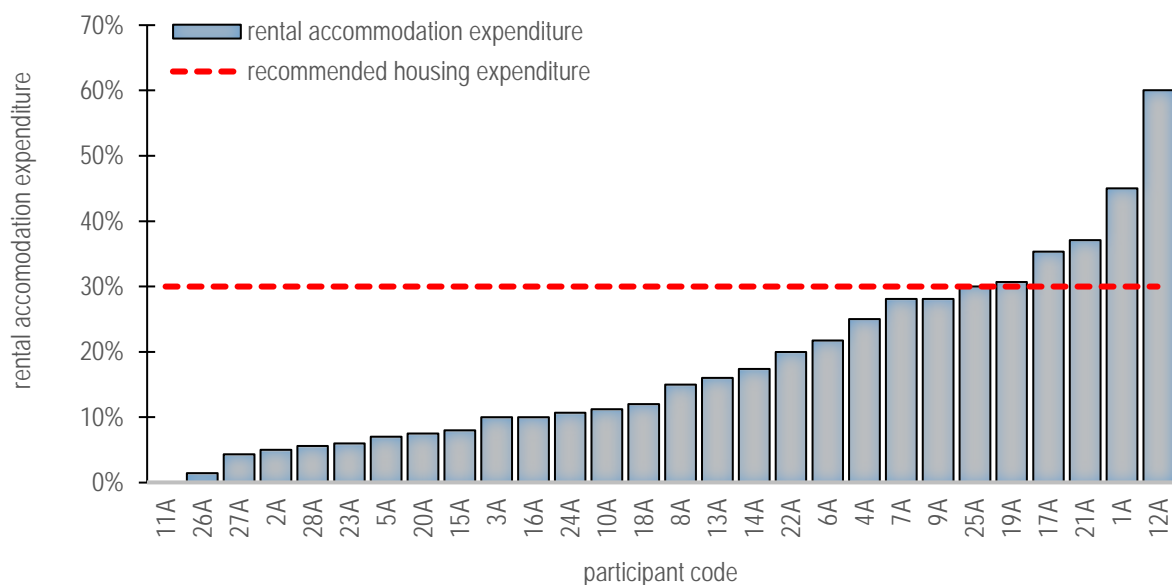

Figure 4: Housing expenditure compared with recommended percentage expenditure

It is recommend that households should not spend more than 15% of their household income on transport. Figure 5 shows the percentage of household income spent on transportation, revealing that 29% of the participants spend 15% or less of their household income on transport, whilst 71% of the participants spend more than 15% of their household income on transport. Residing in a node is designed to reduce transportation costs. However, in the circumstances of the participants in this study, it is evident that most participants spend a larger portion of their household income on transport. This is because majority of the participants do not work in the node, with 48% of the participants travelling for more than 31 minutes to get to work. Thus, one of the main decisions to move to the node is based on the availability of transport and low housing cost provided. The burden of high transport costs may create financial problems because it can compromise low-income households capability to access required services and livelihood-improving opportunities. Furthermore, households are continuously making trade-offs between housing and transport to meet their other financial requirements such purchasing food.
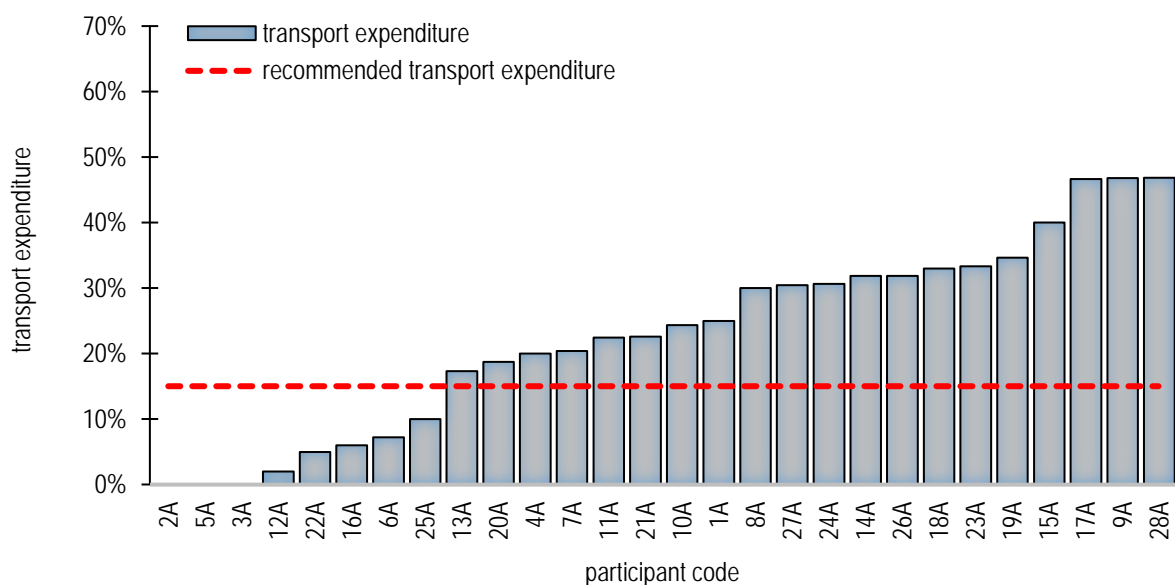

Figure 5: Transport expenditure compared with recommended percentage expenditure

4.3.3 Benefits for the Participants of Residing in Proximity to Transit in a Social Housing Development

The benefits of residing in a node in a social housing development are as follows:

- Access to affordable housing.
- Increase in the opportunities for, and appeal of, alternatives to private vehicles.
- Increase in public transport accessibility.
- Decrease in travel distance and time.
- Proximity to large employment concentrations that are well served by extensive local and regional transport systems.

The findings from the data demonstrate that 27% of the participants indicated that they experienced a decline in travel time and an increase in financial savings since their relocation. It is also noted, however, that some do not identify any benefit in residing in the node.

5. DISCUSSION AND CONCLUSION

This research sought to understand the relationship residential relocation has on the behaviour and/or decision-making processes of households. The research observed the following:

1. *The impact (influence) of the built environment on decision making*: The respondents are making decisions based on their new environment however the respondents do not think that they are making decisions based on the new environment to meet their current needs. However, it is evident through a spatial mapping exercise that the participants use activities that range from restaurants to transit facilities with the majority of the participants walking to the various spaces. This confirms that the built environment can influence decision making on mobility choices owed to the walkable design that the node holds. However, the participants will use other modes such as a private car or public transit to commute to places outside of the node such as visiting family or going to places of leisure that do not meet the participant's objectives in the node.

2. *Understanding travel patterns*: Travel patterns are best understood through residential relocation. The respondents make complex decisions to relocate to the Roodepoort node. Some of the reasons for relocation include, relocating for independence, new employment, a growing family, requirement for a bigger space, affordable rental and because the development was safer. The change in place of residence enabled some participants to change their mode of transport thus altering their daily travel pattern. There is evidence of an increase in the number of people that walk and an increase in the usage of private car and ownership. It is recommended that various government departments better understand the users and their aspirational needs so as to create better development plans and policies that redirect aspirational needs. This requires a cultural shift that is supported by the necessary infrastructure and spatial planning.

3. *Demonstrating the relationship between transport and housing*: Affordability is crucial in demonstrating a respondent's relationship between transport and housing. Respondent household expenditure patterns indicated a greater percentage of income is spent on transport in comparison to housing. The respondents made an intentional decision to relocate to the social housing scheme in the node because of affordable rental provision and access to a variety of transit (non-motorised and public transport) availability. The trade-off that the respondents make is residing in affordable housing, close to public transport but are required to commute for longer to get to places of employment. It is recommended that the various sectors of government improve their prioritisation model between conflicting needs through balancing economic opportunities, transport, human settlement, urban management and sustainability (South African Cities Network, 2016).

4. *Impact of residing in social housing in a node*: Some residents reported minimal benefits of residing in the social housing development. It is recommended that the Social Housing Company investigates that possibility of enabling single unit ownership for rent to buy option because majority of the respondent have been residing in the development for over five years. Other residents reported that there are overall benefits of being located in a node. These benefits are linked to a reduction in travel time and possible financial savings. The overall impact of residing in the node is beneficial for the participants because the node is well located, they have access to economic opportunities, social facilities and public transport.

In conclusion, residential relocation influences travel behaviour (pattern) in a new environment. Respondents are therefore required to undergo a process of making complex decisions on daily travel and mode choice selection. The decisions that the 31 respondents have taken demonstrates that the choice to live in affordable housing in proximity to transport facilities is beneficial because it enables them to commute with ease to work outside of the node. However, working outside of the node results in longer travel time and increases transport expenditure. The study found that residents have aspirations that may be deemed undesirable from a transport policy perspective, because there is a trend of increased private vehicle usage since relocation. Furthermore, additional research is required to determine how these aspirations influence the trade-offs households make following residential relocation.

6. REFERENCES

Ajzen, I. 1988. Attitude, Personality, and Behaviour. New York: Open University Press.

Bamberg, S, Ajzen, I & Schmidt, P. 2003. Choice of travel mode in theory of planned Behaviour: The role of past behaviour, habit and reasoned action. Basic and social psychology, 25(3):175-187.

Behrens, R, Adjei, E, Covary, N, Jobanputra, R, Wasswa, B & Zuidgeest, M. 2015. A Travel Behaviour Change Framework for the City of Cape Town. Centre for Transport Studies University of Cape Town. Available at:
https://repository.up.ac.za/handle/2263/57750. Accessed 20 November 2020.

Cao, X. Mokhtarian, PL & Handy, SL. 2009. Examining the Impacts of Residential Self-Selection on Travel Behaviour: A Focus on Empirical Findings. Transport Reviews, 29(3):359-395.

Cervero, R & Radisch, C. 1996. Travel choices in pedestrian versus automobile oriented neighborhoods. Transport Policy, 3(3):127-141.

Crane, R. 2000. The Influence of Urban Form on Travel: An Interpretive Review. Journal of Planning Literature, 15(1):3-23.

City of Johannesburg. 2008. Regional Spatial Development Framework. Available at: https://www.joburg.org.za›Pages›policies›Region-C. Accessed 3 November 2019.

City of Johannesburg. 2016. Spatial Development Framework. Available at: https://www.joburg.org.za›Citywide Spatial Policies. Accessed 17 July 2021.

De Vos, J & Witlox, F. 2016. Do people live in urban neighbourhoods because they do not like to Travel? Analysing an alternative residential self-selection hypothesis. Available at: http://www.sciencedirect.com/science/article/pii/S2214367X15000435.
Accessed 4 February 2021.

De Vos, J, Witlox, F & Van Acker, V. 2014. The influence of attitudes on Transit-Oriented Development: An explorative analysis. Available at:
https://ideas.repec.org/a/eee/trapol/v35y2014icp326-329.html. Accessed 15 June 2021.

Department of Human Settlements. 2009. The National Housing Code: Social and Rental Interventions. Available at: http://www.dhs.gov.za/sites/default/files/documents/national_housing_2009/1_Simplified_Guide_Policy_Context/1%20Vol%201%20Part%201%20Simplified%20Guide%20to%20the%20National%20Housing%20Code.pdf. Accessed 20 July 2021.

Dewita, Y, Burke, M & Yen, BTH. 2020. The relationship between transport, housing and urban form: Affordability of transport and housing in Indonesia. Case Studies on Transport Policy, 8:252-262.

Dewita, Y, Yen, BTH & Burke, M. 2018. The effect of transport cost on housing affordability: Experiences from the Bandung Metropolitan Area, Indonesia Land Use Poldi, 79:507-519.

Eriksson, L & Forward, SE. 2011. Is the intention to travel in a pro-environmental manner and the intention to use the car determined by different factors? Transportation Research Part D, 16:372-376.

Fairnloye, T, Mogaji, E, Aririguzoh, S & Kieu, T. 2019. Qualitatively exploring the effects of change in residential environment on travel behaviour. Travel Behaviour and Society, 17:26-35.

Handy, S, Cao, X & Mokhtarian, P. 2005. Correlation or causality between the built environment and travel behavior? Evidence from Northern California. Transport Research Part D. 10:427-444. Available at: http://www.sciencedirect.com. Accessed 13 September 2021.

Housing Development Agency. 2013. Reviving our Inner Cities: Social housing and urban regeneration in South Africa. Available at: http://thehda.co.za/pdf/uploads/multimedia/HDA_NASHO_reseach_report_lo-res.pdf Accessed 10 August 2021.

Howell, A, Currans, KM, Gehrke, S, Norton, G & Clifton, KJ. 2018. Transportation impacts of affordable housing: Informing development review with travel behaviour analysis. Journal of Transport and Land Use, 11:103-118.

Jeng, J & Fresenmaier, DR. 2002 Conceptualising the travel decsion-making hierarch: A review of recent development. Torisim Analysis, 7:15-32.

Khattak, AJ & Rodriguez, D. 2005. Travel behavior in neo-traditional neighborhood developments: A case study in USA. Transportation Research Part A. 39:481-500.

Lanzendorf, M. 2003. Mobility biographies: A new perspective for understanding travel behaviour. Paper presented at the International Conference on Travel Behaviour Research (IATBR), Lucerne, and 10-15 August. Urban research centre Utrecht, Utrecht University, The Netherlands.

Lerner-Lam, E, Celniker, PS, Halbert, GW, Chellman, C & Ryan, S. 1992. Neo-Traditional Neighbourhood Design and Its Implication for Traffic Engineering. Available at: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.182.6240&rep=rep1&type=pdf Accessed 15 September 2021.

Łucka D. 2018. How to build a community. New Urbanism and its critics, Urban Development Issues, 59:17-26.

Mattingly, K & Morrissey, J. 2014. Housing and transport expenditure: Socio-spatial indicators of affordability in Auckland Cities, p 69-83.

Rau, H & Manton, R. 2016. Life events and mobility milestones: Advances in mobility biography theory and research. Journal of Transport Geography, 56:51-60.

Scheiner, J. 2018. Transport costs seen through the lens of residential self-selection and mobility biographies. Transport Policy, 65:126-136.

Scheiner, J. & Holz-Rau, C. 2012. Changes in travel mode use after residential relocation: A contribution to mobility biographies. Transportation, 40(2):431-458.

Schlich, R & Axhausen, KW. 2003. Habitual travel behaviour: Evidence from a six-week travel diary. Transportation, 23:13-36.

Schwanen, T & Mokhtarian, PL. 2005. What affects commute mode choice: Neighborhood physical structure or preferences toward neighborhoods? Available at: https://escholarship.org/uc/item/4nq9r1c9. Accessed 5 November 2019.

Schwartz, B, Ben-Haim, Y & Dacso, C. 2011. What makes a good decision? Robust satisficing as a normative standard of rational decision making. Journal for the Theory of Social Behaviour, 41(2):209-227.

South African Cities Network. 2016. State of South African Cities Report. South African Cities Network. Johannesburg.

SHRA. 2020. State of the social housing report. Available at: https://shra.org.za/sites/default/files/SHRA%20SOSH%20Report%20%2831-03-21%29_compressed.pdf. Accessed 20 July 2020.

STATS SA. 2017. Living Conditions of Households in South Africa: An analysis of household expenditure and income data using the LCS 2014/2015. Available at: http://www.statssa.gov.za/publications/P0310/P03102014.pdf. Accessed 1 May 2019.

Tissington, K. 2013. Mining the Gap: An analysis of the Supply of and Demand for low-income rental accommodation in Inner City Johannesburg. South Africa: South African Research Institution.

Van Wee, B. 2009. Self-Selection: A key to a Better Understanding of Location Choices, Travel Behaviour and Transport Externalities? Transport Reviews, 9(3):279-292.

Venter, C. 2011. Transport expenditure and affordability: The cost of being mobile. Development of Southern Africa. 28(1):121-140. Available at: https://repository.up.ac.za/bitstream/handle/2263/16529/Venter_Transport(2011).PDF?sequence=1. Accessed 1 May 2019.

Welch, TF. 2013. Equity in transport: The distribution of transit access and connectivity among affordable housing units. Transport Policy, 30:283-293.