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Housing and transport expenditure: Socio-spatial indicators of affordability in Auckland

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ABSTRACT

Traditional measures of housing affordability are expressed solely as a function of housing cost and income. This one-dimensional view of affordability ignores transportation costs, which represent a sizable proportion of household expenditure. Conventional measures are problematic due to the extent to which housing location influences transportation costs. Consequently, narrowly construed definitions of housing affordability are misleading indicators of housing stress. This study quantitatively examines intra-metropolitan combined housing and transport affordability in Auckland, New Zealand. The research utilises disaggregate zonal data to develop comprehensive indicators of commuting costs. These indicators are applied to give an integrated affordability index for each statistical area unit within Auckland City. The results suggest that once commuting costs are incorporated into measures, a very different pattern of affordability emerges.

Introduction

Urban sprawl, the low density expansion of the urban fringe, has typified the contemporary development of many cities in Australasia, North America and the British Isles. Yet the normative issue of whether this trend should persist is strongly contested. Not surprisingly, certain aspects of the debate have become relatively entrenched. The diffuse nature of lower density urban forms, *ceteris paribus*, tend to result in decreased accessibility, longer average transport distances, and greater private vehicle use (Anderson, Kanaroglou, & Miller, 1996; Horner, 2002; Low, Gleeson, Green, & Radović, 2005; Newman & Kenworthy, 1989).[1] Higher vehicle use has a number of repercussions from an environmental perspective including the emission of greenhouses gases and pollutants injurious to human health. Low density development, *ipso facto*, demands more land for housing and infrastructure per capita, resulting in more green space, habitats of ecological importance, and productive agricultural land being consumed on the urban periphery. Proponents of low density urban fringe development, however, assert that urban sprawl is merely consumer preference writ large and a means of urban development which is conducive to housing affordability. The economic logic of the latter relies on the premise that a greater supply of available land via urban expansion will lower property prices. This is supported by a number of widely cited affordability studies which have contended that housing prices could be lowered by planning authorities taking a more permissive approach towards urban fringe development (for instance Demographia International (2011), Glaeser and Gyourko (2003) and Quigley and Raphael (2005)).

Spatial planners and other decision makers are therefore ostensibly confronted with a tension between affordability objectives and environmental considerations. However, if housing affordability arguments are to be used to justify urban sprawl, then the definition and methodologies of housing affordability need to be re-examined to ensure that economic benefits of housing location are not inaccurately over-stated. Central to the argument forwarded by this paper is the assertion that conventional measures of housing affordability are not only inadequate, but are to a large extent meretricious. The current housing affordability paradigm ignores other significant costs, namely those of transportation, which represent a sizable proportion of household expenditure. This is a substantial shortcoming given the degree to which housing location influences on-going transportation costs. Lower housing prices in outlying urban areas are often offset by high automobile dependency, long commuting distances, and the associated costs of petrol and vehicle maintenance. The omission of

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[1] This is made more complex by the increasing polycentricity of cities which can allow for workers to live closer to their workplace and therefore undertake shorter commuting trips (Anas, Arnott, & Small, 1998; Gordon, Richardson, & Jun, 1991).

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transportation costs from affordability measures therefore leads to the perception that outlying development and low density cities are affordable. Not only do narrow measures of affordability misrepresent the degree and location of housing affordability stress, but the results of such studies may also be used to advocate for changes to the land use rules which shape urban development patterns, and lead to forms of development which are less affordable in the long term.

This paper focuses on the direct financial costs of owning or renting a house and commuting to work, hereafter referred to as *Combined Housing and Transport* (CHT) for Auckland City.

Three research questions are posed: (1) How does household housing and commuting expenditure vary spatially within Auckland? (2) How does measured affordability differ when commuting expenditure is included in developed affordability indicators? (3) What policy implications do these findings have for urban planning in Auckland and other metropolitan centres? By mapping intra-metropolitan CHT affordability in Auckland, the research shows how combined housing and transport affordability varies spatially within the city, and how this differs from conventional measures which do not consider transport costs. The paper critically examines the current perception of housing affordability in outlying areas through the development of a set of empirical indicators and in doing so, queries a narrative which has favoured greenfield development and sprawl, while opposing planning restrictions on development.

Housing costs and metrics of housing affordability

Traditional housing affordability measures

The basic commonality underlying housing affordability indicators is that they attempt to measure the financial burden of housing, typically across some area of geographic space. The concept of 'housing affordability' is itself highly polysemous, having a number of definitions and methodological approaches used in its measurement. These include house price to income ratio (Suhaida et al., 2011), residual income after housing costs (Stone, 2006), and purchase and repayment affordability (Gan & Hill, 2009). While there is no single agreed measure, the most frequently employed is that of housing expenditure-to-income ratio (Hulchanski, 1995; Jewkes, Delgadillo, & Lucy, 2010; Stone, 2006). The dichotomy between what is affordable and unaffordable is typically delineated by a 30%-of-income threshold, with housing costs greater than this deemed unaffordable (Hulchanski, 1995; Nepal, Tanton, & Harding, 2010). While the qualifier 'arbitrary' or 'subjective' often prefixes discussion of such affordability thresholds, their ubiquity suggests some level of value. However, caution must be given to reducing housing down to affordable unaffordable dichotomies for a concept which has properties more consistent with a continuum (Robinson, Scobie, & Hallinan, 2006).

Housing affordability indicators, namely the housing expenditure-to-income ratio, have a number of limitations. Affordability measures tend to have a narrow scope, satisfied with viewing affordability for median income households of a given area (Gan & Hill, 2009). The most commonly cited criticism of conventional housing affordability indicators is their inability to differentiate between the quality of housing (for instance see Bogdon and Can (1997) and Stone (2006)). A neighbourhood exhibiting high housing prices may simply be suggestive of more positive attributes relative to other areas. Alternatively, Stone (2006) notes that a household could spend less than 30% of their income on housing which is structurally unsafe, inadequate for the needs of its inhabitants, or poorly located with respect to work. Higher housing expenditure in proportion to income should not therefore be unquestionably equated with being inimical to household interests. That being said, housing affordability indicators can provide a meaningful measure of the financial burden of housing facing middle and lower income families.

While the aforementioned issues have occupied affordability research, there has been a distinct neglect of other costs associated with housing choice. Most prominently, housing affordability studies generally neglect the spatial dimensions of transport cost despite the strong influence of housing location on household transport expenditure. A central tenant underlying many urban economic models, most notably the monocentric city (or spatial equilibrium) model, is that there is a perfect trade-off between transport and housing expenditure; in equilibrium a competitive market ensures CHT costs are constant throughout the city regardless of location (Glaeser, 2008).[2] While many such simplifying assumptions utilised in mainstream economics imperfectly represent individuals and urban systems, there is some worth in the idea that transportation costs increase with distance from employment clusters, and that therefore there should be some effect on housing prices to account for this. The theory is reinforced by other urban economics research (for instance Bajic (1983), Gibbons and Machin (2005) and So, Tse, and Ganesan (1997)) which presents strong evidence of transportation savings derived from accessibility to employment centres being at least partially capitalised into residential housing value. From this perspective, higher house prices, *ceteris paribus*, should be found in more accessible neighbourhoods.

Combined housing and transport affordability

Recent studies have begun to address the transport-related flaws in housing affordability measures, particularly in terms of the geography of housing and transport. Research undertaken by Currie and Senbergs (2007) found that households living in peripheral neighbourhoods tend to own more vehicles than their inner city counterparts. The lack of easily accessible public transport in these outlying areas necessitates ownership of a car to access jobs and services, which can represent a large and on-going financial burden for low income families (Currie & Senbergs, 2007). Viggers and Howden-Chapman (2011) suggest that residing in inaccessible locations can harm the financial sustainability of home-ownership. Their study of Auckland found higher rates of mortgagee sales in areas where households exhibited long commuting distances and lacked viable public transport (Viggers & Howden-Chapman, 2011). Research in Australia suggests that rising oil prices pose the greatest financial risk to those living in peripheral suburbs where higher levels of vehicle use and lower incomes are found (Dodson & Sipe, 2008). Dodson and Sipe (2008) go onto express the need for further research which specifically examines the geography of CHT expenditure.

A nascent strand of research has developed the means of explicitly pricing inter and intra-metropolitan CHT affordability in North American and Australian cities. One of the first such studies, conducted by Lipman (2006), investigated inter-urban and intra-urban variation in CHT expenditure as a percentage of income. The Center for Transit-Oriented Development (2006) and Center for Transit-Oriented Development (2011) developed an index which mapped CHT affordability at a finer geographic scale. Kellett Morrissey, and Karuppannan's (2012) study of Adelaide showed that the inclusion of transport costs changes the location of those areas deemed unaffordable, with peripheral neighbourhoods being particularly prominent in terms of their new found unaffordability. Kellett et al. (2012) also explored variation in transportation expenditure under a num-

[2] The mathematical workings are comprehensively explained in Anas et al. (1998).