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# Home-based work in cities: In search of an appropriate urban planning response

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## ABSTRACT

Home-based work is becoming an increasingly popular form of work in cities, fuelled by technological advances, lifestyle preferences, demographical change and rapid evolution of the knowledge economy. In many cities, particularly those planned and developed with intentional separation of land uses, this return of economic activities to residential neighbourhoods brings along both lifestyle opportunities and spatial challenges. Attempts to formulate appropriate urban planning responses are hindered by the limited understanding of home-based workers' needs and aspirations, as well as their impacts on the built environment. Responding to this knowledge gap, this paper presents the results of a survey focused on urban planning implications of home-based work within the City of Gold Coast (Queensland, Australia). The findings provide strong evidence of home-based workers' preferences for neighbourhoods that integrate residential amenities with place-making initiatives to enhance economic performance, networking and collaboration. Several urban planning recommendations are provided in three separate scenarios to facilitate the formulation of strategies prompting a gradual evolution of residential neighbourhoods towards live/work urban environments.

## 1. Introduction

Each January, the attention of innovators, futurists and pioneering thinkers turns towards Las Vegas, where the annual Consumer Electronic Show is held. Interestingly, the 2018 gathering was not dominated by drones, sophisticated gaming products and artificial intelligence, but by smart city technologies and scenarios for cities of the future, such as the Quayside project. Quayside is a smart city development proposed for the Toronto metropolitan area by Sidewalk Labs, a subsidiary of Google's parent company, Alphabet. Among many innovative solutions said to reimagine the city, such as data harvesting, energy-efficient buildings with no zoning controls, driverless cars and sustainable sources of electricity, the Quayside project offers initiatives for live/work dwellings and co-working spaces, in the assumption that most employment opportunities in cities of the future will no longer be concentrated in city centres.

Initiatives enabling future Quayside residents to live and work within the same neighbourhood appear to embrace ongoing shifts in the way that work is organised and distributed in contemporary cities. Recent research published by urban economists attribute these shifts to several interrelated processes: ongoing technological advances, demographic changes, growth of empowered

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individuals, emerging international networks of knowledge and the global transition towards knowledge-based economy where the key ingredient is human capital (Alizadeh & Sipe, 2013; Glaeser, 2011; Moretti, 2012). For example, knowledge-based economy paired with technological advances appear to strengthen the role of cities as a co-location site for entrepreneurs and, at the same time, enable businesses to operate online, without a conventional business premise (according to Mason, M., & Tagg, 2011, half of small businesses in UK are home-based). Spatial changes in the way that work is organised and distributed, described by researchers examining the problem as an ongoing decentralization of certain urban functions (Burgess & Strachan, 2001; Lüthi, Thierstein, & Goebel, 2010; Shao, 2015), have a long-term impact on the morphology of cities. These impacts include ongoing urban sprawl (i.e., Couch, Leontidou, & Petschel-Held, 2008), relocation of industries and large-scale businesses to the outskirts of cities, creation of the city-regions (Parr, 2005) and a growing popularity of home-based work in residential neighbourhoods, which is of interest to this research paper. Despite the documented growth of home-based work – according to the 2016 Australian Census, this form of employment grew in major Australian cities by approximately 25 % in just five years (Australian Bureau of Statistics, 2017), exceeding the overall employment growth rate of 10 % – studies about its spatial implications on cities are scarce. In the absence of research-based evidence on the level of impact that home-based work has on cities, planners and policymakers often overlook this form of employment. This knowledge gap constitutes a research space for exploring what Australian demographer Bernard Salt described as “the quiet revolution occurring in suburbia” (NBN, 2016), where residential neighbourhoods gradually evolve towards multi-use urban environments. Our paper has been structured to address this research gap through the following questions:

- 1 How does home-based work affect the built environment of residential neighbourhoods in terms of transport, home modification and residential relocation?
- 2 What urban planning strategies are appropriate to accommodate home-based work in residential neighbourhoods?

For the purposes of this paper, the built environment is considered to be “the part of the physical environment that is constructed by human activity”, as defined following from Saelens and Handy (2008). This research is intended to be of assistance to city planners and policymakers who play a variety of roles in enhancing a city’s urban form and economy (Porter, 2000). To this end, data needed to advance knowledge in this field and address the research questions was gathered through a web-based survey conducted in the City of Gold Coast, Australia, from December 2016 to February 2017. The survey was designed to target the local home-based worker community, seeking to understand their cumulative impact on the residential neighbourhoods and conceptualize their attitudes and preferences towards living and working in neighbourhoods that enhance collaboration and networking.

The remainder of the paper is as follows: first, we provide a brief review of the current literature on home-based work, and then describe the survey methodology, including an overview of the case study area to provide context to those not familiar with Australia. This section also includes a discussion of the methods used to engage the home-based community in the study area. Finally, the concluding sections of the paper provide a summary of the survey findings, a discussion of the results and recommendations for city planning.

## 2. Literature review

For this research, home-based work was defined following the definition used by Felstead, Jewson, Phizacklea, and Walters (2001), as “an economic activity carried by members of households who produce within their place of residence commodities for exchange in the market”. We build on this definition to distinguish between two categories of home-based work: own-account producers and dependent workers. The former category is usually initiated by a lifestyle decision to be independent, and referred to as a home-based business (Ye, 2012; Vorley & Rodgers, 2014). The latter, on the other hand, is often described as telework or telecommuting (Ettema, 2010; Mokhtarian, Collantes, & Gertz, 2004), implemented by a conventional, office-based business to reduce costs and/or offer employees work/life balance benefits. The growth of home-based work is linked to changing lifestyle preferences, including the desire to own a business, and is facilitated by ongoing telecommunication advancements (Khallash & Kruse, 2012). Home-based work is perceived to contribute to personal and family success (Hill, Ferris, & Mårtinson, 2003; Morganson, Major, & Oborn, 2010) and is often described as a desirable type of employment (Lim & Teo, 2000; Maruyama, Hopkinson, & James, 2009).

There is ample literature on the socio-economic aspects of both telework and home-based businesses. Literature dedicated to telework often identifies this type of work as desired by employees. For example, a recent study by Mas and Pallais (2016), which measured employee-friendly alternatives offered by companies, concluded that telework is the most valued alternative work arrangement. The study also found that employees were willing to take 8 % lower wages to have the option of working from home. Another study, held in a call centre in China, found evidence that home-based workers were more productive and happier than their office-based colleagues (Bloom, 2014). Telework was found to be an important factor in locational decisions (Mokhtarian et al., 2004, in a study of workers based in California, US). Muhammad, Ottens, Ettema, and de Jong (2007) measured telecommuting arrangements in the Netherlands, concluding that telecommuters have a higher probability than people who commute to work to reside in more peripheral urban areas, contributing to urban sprawl (see also Ettema, 2010). Further studies point to the cumulative impacts on established urban, transport and environmental planning practices of home-based workers’ travel patterns (not bound to daily work commutes) and locational preferences (Larson & Zhao, 2017; Moeckel, 2017).

Unlike large companies offering telework arrangements to their employees, home-based businesses prefer to stay small (Van Gelderen, Sayers, & Keen, 2008), diverse and niche (Jain & Courvisanos, 2013). Despite limited aspirations to grow, these businesses can be important primary sources of household income, as well as an important local source of business investment and innovation, if

performed by qualified individuals (Wang, Walker, Redmond, & Breen, 2009). On the contrary, economic performance of home-based businesses has been questioned by Neumark, Wall, and Zhang (2008), who stated that this type of employment is a less desirable form of a city's economy because it tends to exist for a shorter period of time, offers relatively lower wages, and often involves inadequate working conditions involving lower levels of job training and professional development opportunities. A similar observation was made by Sayers (2009), who noted that home-based businesses are often assumed to be merely a hobby or artisan occupation. The profitability of certain types of home-based businesses such as online selling and crafting has been further questioned by Luckman and Andrew (2018) who noted that such businesses, particularly when carried out by stay-at-home mothers as a temporary source of income while caring for small children, may effectively lead to un- or under-employment.

While both home-based businesses and telework are associated with seemingly high social status, researchers also point to the social, professional and physical isolation which is considered a major drawback (Bartel, Wrzesniewski, & Wiesenfeld, 2007). Home-based work is therefore considered to be a multi-layered and complex subject, combining the need for autonomy and creative management of time and place with a sense of unease and loneliness (Daniel, Di Domenico, & Nunan, 2018).

On a broader, neighbourhood scale, the growth of home-based work brings concerns related to impacts on neighbourhood amenities, the stability of property values, and societal perceptions that quiet housing areas are preferred habitat for families with children (Hirt, 2016). Despite of those concerns, the growth of home-based work appears to be gaining momentum. Researchers recognize that whilst the role of cities as facilitators of knowledge and co-location of entrepreneurs continues to strengthen (Darchen, 2017; Florida, 2014; Glaeser, 2013), residential areas located at the periphery of cities are becoming digitally connected to traditional central business districts (Audirac, 2005). Such areas appear to attract entrepreneurial people and often become places of collaboration and coworking (Foth, Forlano, & Bilandzic, 2016; Reuschke, Mason, Syrett, & van Ham, 2015), with evidence suggesting that many successful small to medium enterprises start as home-based entities (Young, 2013). Home-based work in cities is likely to be clustered, with demography and socio-economic status being amongst the key factors (Davidson, 2018). Residential neighbourhoods with high proportion of home-based work are often referred to in academic literature as mixed-use (Hirt, 2016) or live/work communities (Alizadeh & Sipe, 2013; Dolan, 2012), where working activities share space with leisure, sports and other activities. In academic papers studying home-based work, a common notion is that such neighbourhoods in cities are places of small-scale businesses of all sorts (Reuschke et al., 2015), requiring more attention from policymakers and practitioners.

Whilst the contribution of home-based work to the economy of cities remains open to debate, Davidson (2018) rightly notes that, as this type of work becomes mainstream, new public policies must emerge to meet the needs of this business sector. These policies should aim to create conditions enabling knowledge to spread and to support good urban planning and land use outcomes (Haskel & Westlake, 2017). Our research aims to contribute to this emerging, but important, literature on the role of home-based work and its influence on the built environment.

### 3. Research methodology

#### 3.1. Survey structure

Impacts of home-based workers on components of the built environment of residential neighbourhoods (local transport, home modification, residential relocation) were measured through three avenues: work-related car trips, ability of home-based workers to relocate and add to the urban sprawl, and the scope of changes done to residences in order to accommodate home-based work. Questions about work-related car trips were included in the survey to measure demand for parking spaces in the residential areas and the overall pressure on the road network, both in the scale of the local neighbourhood and city-wide. This part of the survey sought to capture home-based workers' actual movements and decisions.

Examining the urban planning strategies that are appropriate to accommodate home-based work in residential neighbourhoods involved enquiry into home-based workers' aspirations, needs and ideas. The purpose was to better understand whether potential placemaking solutions would appeal to the home-based worker community in the City of Gold Coast. Questions in this part of the survey sought to identify home-based workers' preferences towards the evolution of residential neighbourhoods into mixed-use (Alizadeh & Sipe, 2013; Dolan, 2012; Hirt, 2016; Holliss, 2015). Based on the literature review, six features of urban environment facilitating home-based work were identified and provided in the survey. Participants were asked to describe preferences towards each feature on a 1–5 scale, with 1 being 'strongly disagree' and 5 'strongly agree'. These features included:

- (a) availability of a local centre with services for home-based workers, such as office supplies, meeting rooms, printing services and eateries;
- (b) designation of dwelling spaces for home-based work (including, for example, separate entry for visitors, designated work space, additional on-site parking for customers or employees);
- (c) unrestricted employment of non-residents;
- (d) permission of advertising structures and signage on home-based worker premises;
- (e) permission to display and sell goods directly from the premises; and
- (f) neighbourhood design promoting walkability over other modes of transport.

Subsequent survey questions asked about the role of neighbourhood design in enabling local networking to foster home-based workers' income and mitigating the sense of social isolation, which was a key challenge found in the Bartel et al.'s study (2007). The urban planning strategies formulated in this paper were based on exploratory data analysis of the impacts measured during the first

part of the survey and home-based workers' preferences and aspirations captured during the second part of the research. The exploratory data analysis sought to identify certain respondent clusters, acknowledging that home-based workers are not a homogenous mass. The survey also included several questions seeking to understand the socio-economic profile of home-based workers. Participants were asked to specify what prompted them to undertake home-based work and whether they intend to continue to work from home in the next three years. This question had a multiple-choice option and included: lifestyle preferences, desire to own a business, tax benefits, cost-efficiency, lack of appropriate jobs available and an open-ended section enabling respondents provide other, unique reasons. Participants were also asked about their type of occupation, gender and age. The City of Gold Coast was chosen to be the case study area because of its uniqueness, as outlined in the following section.

### 3.2. Case study area

With its population of approximately 555,000, the City of Gold Coast is Australia's largest non-capital city and the fastest growing local government area in the country (Australian Bureau of Statistics, 2017; Yigitcanlar, Fabian, & Coiacetto, 2008). It is recognized both domestically and internationally as a popular tourist and lifestyle destination, with over 2,750,000 domestic and international tourists visiting the city each year (Griffith University, 2015). The city's reputation as a tourist destination is bolstered by 57 km of picturesque coastline, proximity to a world-heritage listed rainforest and a sub-tropical climate offering almost 300 days of sunshine per year. The major employment sectors within the city are hospitality and services, with the industry sector remaining heavily underdeveloped for a city of this size. The city's economic prosperity has been driven largely by tourism and strong population growth, with a focus on servicing local population needs across construction, retail and services (Gold Coast Economic Development Strategy, 2013–2023). In recent years, in an effort to diversify the local economy, the city has undertaken attempts to increase levels of employment in sectors focused on markets external to the Gold Coast. These initiatives are ongoing and, in absence of a broader labour market for skilled professionals, over 30,000 residents commute daily for work to Brisbane, Queensland's capital city, located approximately 60 km to the north (see Fig. 1a). Limited job opportunities for professionals, combined with the city's reputation as a desirable lifestyle destination contribute to a higher than average proportion of home-based workers, which currently sits at approximately 7 % of the workforce (Australian Bureau of Statistics, 2017), positioning Gold Coast as a suitable case study area for the purpose of this research.

Gold Coast has a unique linear, polycentric shape (see Fig. 1b), without a distinctive city centre. This urban form is a consequence of the city's rapid evolution which saw several small coastal towns merging into a single city through an intensive urban sprawl occurring continuously since the 1960s.

### 3.3. Engagement with home-based workers

The survey sought to engage with a cross-section of the local home-based work community, with the aim of exploring

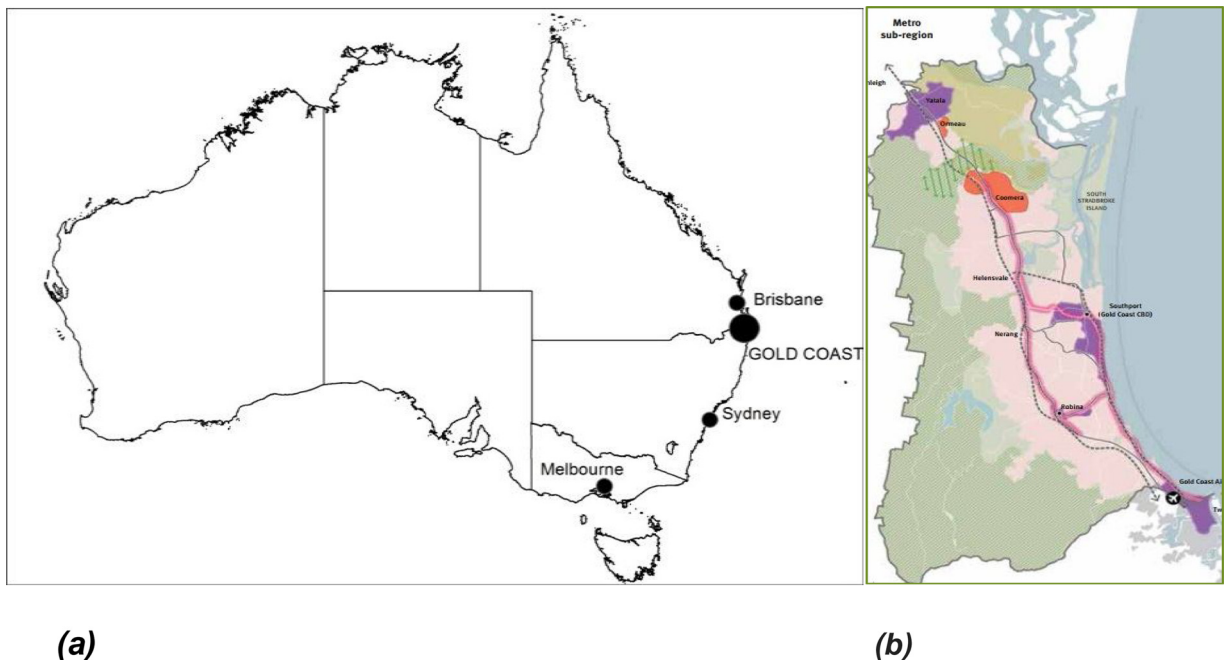


Fig. 1. (a). Location of the City of Gold Coast and (b) its urban footprint.

Sources: Fig. 1(a) – author's own, Fig. 1(b) – Queensland Government, 2017

characteristics about this otherwise hard-to-identify population. The online survey was implemented in four ways: through engagement with the local small business networking groups, a social media campaign, an advertisement published on the front page of the local newspaper, and personalised invitations dispatched to home-based businesses identified through search engines and directories such as Yellowpages and Whitepages. Through this multi-faceted sampling approach, we were able to widen the possible reach of the survey and increase the potential number of respondents, given that there was no comprehensive registry that had information about who is/is not a home-based worker. The objective of the study was not to make inferences about the population of home-based workers in the City of Gold Coast, based on the obtained sample. Instead, by employing this 'snowball' sampling approach, we hope to be able to discover information that would otherwise be difficult to obtain (or be prohibitively expensive) using conventional random sampling approaches. Furthermore, by using this approach, it is possible to use the data collected for preliminary analysis, as a platform for undertaking more detailed research.

The research took place between 1st December 2016 and 28th February 2017. Prior to undertaking the survey, each participant was requested to declare that home-based work was his or her main source of income and that he or she resided within the case study area. These filter questions aimed to exclude people employed in home-based businesses established as a supplementary source of income or in unpaid forms of work carried out from or at home. The survey also provided a plain English definition of home-based work, clarifying that work registered at home but carried out elsewhere (e.g., home renovations, trades, landscaping maintenance or food vans) was not considered home-based work for the purpose of this research. The survey took approximately 12 min to complete.

The engagement campaign resulted in 182 survey responses, with 172 of them considered complete (out of a total of 425 unique visits recorded by the survey website). The 10 surveys deemed incomplete by the research team were rejected from the research. Considering the size of the home-based work population within the City of Gold Coast (11,619 people or 7 % of the working population according to the 2016 Census), completed responses provide a margin of error of 7 %, at the 95 % confidence level.

### 3.4. Survey limitations

The survey research has certain limitations; while the findings are compelling and interesting, caution should be exercised in the interpretation, due to the sampling design. Firstly, the survey asked for information about perceptions, opinions and preferences, which are subjective in nature and therefore susceptible to personal experiences and individual differences. Secondly, the purposeful nature in which participants were recruited through identified social networks introduces some bias into the accuracy and generalization of the results from the survey sample. However, the prevailing consensus is that traditional surveys which rely on randomization are becoming less responsive to understanding complex social phenomena, and network-based internet surveys are advantageous in terms of their convenience, quick-turn around times and low-response burden, particularly in measuring difficult populations (Dutwin & Buskirk, 2017; Tourangeau, Edwards, Johnson, Wolter, & Bates, 2014.). Thirdly, the questionnaire was designed to ensure that respondents were not overly burdened and could therefore complete it quickly. This influenced the breadth of questions measuring the impact of home-based work on the built environment of residential neighbourhoods. Not all such impacts have been explored and there is a need for further research in this space, as highlighted in the discussion section of the paper. Fourthly, the study did not seek to distinguish between home-based teleworkers and home-based businesses, which is an important distinction for urban economy, but is of little importance to urban planning. For example impacts of a home-based accountant or architect on the neighbourhood are likely to be very similar, regardless of whether he or she runs a business or teleworks from home. In addition, engagement with home-based work community held during another component of this research project (in publication) highlighted that they may combine part-time telework with their own business endeavours. Our final limitation relates to the specifics of engaging with home-based workers and encouraging universal participation in the study. It is very likely, that despite efforts to engage with a representative population of home-based workers within the study area, some workers did not receive an invitation to participate. However, by obtaining information from a large enough sample size, we were able to highlight revealing insights about the behaviour and characteristics of home-based workers in the study area.

## 4. Results

### 4.1. Study sample profile

The results from the study sample shows that over 83 % of home-based workers are aged 35–64 years. As no one was reported to be in the youngest age group (i.e. 18–24 years old), this survey indicates that home-based work is being pursued by mature, experienced individuals. There were marginally more women than men, with approximately 53 % of the sample of home-based workers being females. The survey indicated that female home-based workers are more likely to work in business/HR/marketing, education/health or in sales, whilst most male home-based workers operate in business/HR/marketing, ICT and design/engineering occupation groups (as detailed in Fig. 2 below). When asked about the reasons behind undertaking home-based work, over 60 % of respondents pointed to lifestyle preferences, followed by cost-efficiency (55 %, in a multiple-choice question) and the desire to own a business (24 %). Of the final sample of participants, home-based workers operating in the art and media industry cited a lack of appropriate jobs available nearby as their main reason for undertaking such work. Approximately 30 % of all respondents stated that undertaking home-based work enabled them to make the lifestyle decisions to move between larger cities (for example, Sydney and Brisbane) and settle down in the City of Gold Coast, confirming findings from Mokhtarian et al. (2004) on the role of remote work in residential movements.

To understand whether participants undertook home-based work due to the lack of opportunity, they were asked about the desire

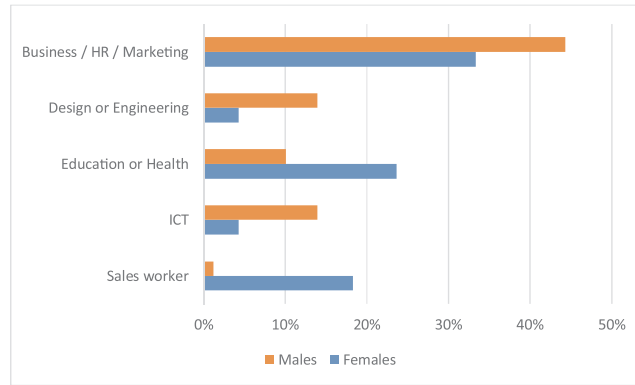


Fig. 2. Key occupation types of home-based workers reported in the survey, by gender.

to continue to work from home. Out of the survey sample, 81 % of participants stated that they intend to do so. The remaining respondents either declared they would not want to work from home (approximately 10 %), they intended to expand their business into an office premises (5 %) or they planned on retiring soon (4 %). Almost half of home-based workers (46 %) aspire to grow their income through investment, innovative products and employment, while 54 % of the sample was looking forward to keeping their work small and manageable.

Other, less common occupation types not included in Fig. 2 above were arts/media, management, technicians and legal or welfare professionals, altogether accounting for under 15 % of home-based workers. Several home-based workers provided commentary in the survey that they found their home-based work difficult to classify into a single, discrete category as they either managed multiple businesses or their work is multi-layered and combined IT development, marketing, sales and customer support, cutting across multiple statistical classification of occupations.

#### 4.2. Influence of home-based work on certain components of the built environment (local transport, home modification, residential relocation)

Participants were taken through a series of questions asking them about the impacts that home-based work has on certain components of the built environment. The enquiry into the scale of this impact opened with a question about the role of proximity to their clients and/or customers as a factor influencing their motivation for home-based business. This proximity turned out to be of limited consideration to more than half of home-based workers, with 54 % of them declaring that they were either not aware of location of their clients/customers or have the majority of their clients/customers outside of the City of Gold Coast. The remaining 46 % stated that the majority of their clients and customers are based within the City of Gold Coast. The next question sought to better understand the frequency of work-related car travels and explore whether home-based work had a positive effect on reducing work-related car traffic. Home-based workers who previously indicated that their clients or customers are mostly based outside of the Gold Coast reported that they either do not need a car for their work at all (22 %) or undertake one or two work-related car trips per week (56 %). The remaining 22 % declared their work required them to use a car for at least one round trip every day. However, there is also another aspect of car travel for home-based workers: a need for customers and clients to travel to their businesses and the associated impacts of those trips on the amenity of the local neighbourhood. Here, participants who indicated they are unaware of the location of their clients and customers reported very limited incoming traffic: 65 % of respondents reported no work-related car trips to their homes, 28 % reported 1–2 car trips per week and only 7 % stated that work-related car trips to their homes occur frequently.

However, car travel patterns amongst home-based workers who have most of their clients and customers based within the case study city were substantially different. Only 11 % of home-based workers reported that they do not need a car for work, whilst 40 % undertake 1–2 work-related trips every week and the remaining 49 % travel regularly (i.e., at least one round trip each work day). The incoming work-related traffic was reported to be frequent for 23 % of respondents (at least one visiting car each day), amount to only 1–2 incoming car trips each week for 28 %, and be non-existent (i.e., their work does not result in car-related trips to their homes) for the remaining 49 %.

Further, the survey measured the extent of modifications to residences needed to accommodate work at home. The results from this show that there was a complex use of space, and this was related to the type of business. As illustrated on Fig. 3, 40 % of home-based workers converted one bedroom into a designated workspace. A further 20 % carried out similar modification but also added that their work requires them to use a laptop or other electronic device and therefore their work can be done from any place, whether inside their home or remotely. Only 15 % of home-based workers did not have a dedicated workplace at home. Further, less common arrangements included conversion of two or more rooms, a garage, one room and a garage, or structures or land outside home (such as home-based swimming schools).

The above results were crosschecked against the occupation types. Home-based workers operating in the business / HR / marketing field are more likely to work from a designated office room, whilst ICT professionals prefer to convert their garages into workspaces. Sales workers frequently indicated that their work required ‘more than one room’, presumably a storage space for the goods that they sell. Lastly, designers, engineers and workers from the arts/media sector often indicated that they tend to work from

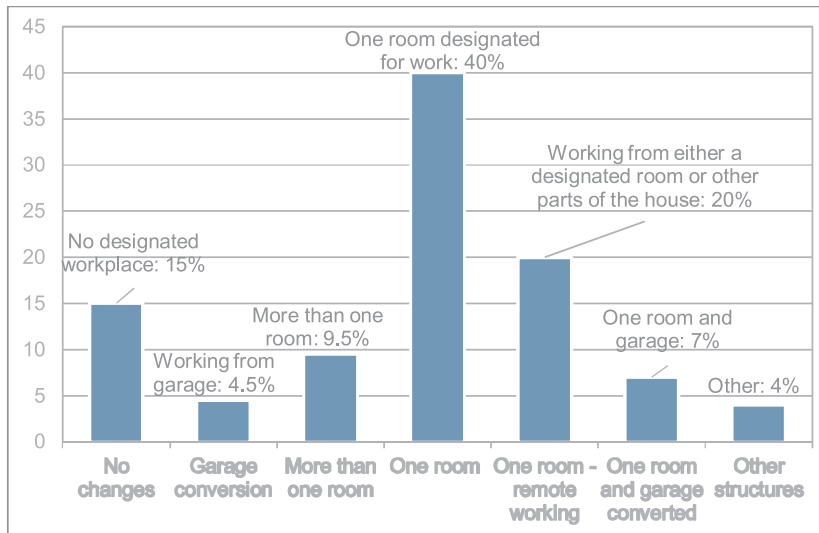


Fig. 3. Different reported scenarios for accommodating work at home.

any place, as long as they are online.

Next, the home-based workers were asked about the suburb in which they live. This enabled the research team to gain some insight into the role that home-based work may have in ongoing urban sprawl as hypothesized in earlier studies on this subject (see, for example, Ettema, 2012; Muhammad et al., 2007). We used the reported address of each survey participant's business to geocode their location and then subsequently mapped and analysed the location in the context of the city's urban footprint (as demonstrated in Fig. 4). This analysis indicated that home-based work appears to be clustered in three areas within the city: two of them are in close proximity to Gold Coast's business centres (namely, Southport in the centre of the city and Robina to the south), whilst the third cluster is located at the north-western fringe, within the fast-developing urban growth area. Interestingly, home-based work is uncommon in the heavily populated areas along the coastal strip. This can be taken as support of the claims by Ettema (2010) and Muhammad et al. (2007) that higher concentrations of home-based work lead to the spreading of the city and its suburbs over more and more rural land. This finding is partially confirmed with the evidence of a higher concentration of home-based workers in Gold Coast's peripheral urban areas.

#### 4.3. Preference for the evolution of residential neighbourhoods towards multi use

It was mentioned in the introduction to this paper that smart city developments which move from dedicated city business districts to more seamless live/work spaces are suggested as cities of the future. We wanted to ask the opinions of study participants about their views to living (and working) in such cities. Therefore, the survey asked home-based workers about their preference for living in neighbourhoods designed to accommodate live/work functions. The literature review on the subject suggested several features of such neighbourhoods (see Fig. 5). Home-based workers appear to have a moderately strong preference for neighbourhoods featuring a local centre with services facilitating their work, such as a co-working space with meeting rooms and office supplies. There is also a moderately strong preference for walkable neighbourhoods and dwellings designed to facilitate work from home. However, a slightly weaker preference was identified with respect to unrestricted employment of non-residents and the display and sale of goods directly from the premises (these two features are often prohibited by planning legislation). Approximately 53 % of participants stated that some, but not all, residential neighbourhoods should be designed in accordance with the above principles, with 16 % declaring that all residential areas should be designed in this way but without strict adherence to the principles, while the remaining 31 % stated that such interventions are not necessary.

Home-based workers largely agreed that opportunities for networking and face-to-face connections within one neighbourhood would mitigate feelings of social isolation, improve job satisfaction and assist in increasing income (Fig. 6). The research then focused on the analysis of the relationship between home-based workers' intention to expand their work and income (46 % of survey participants), as opposed to desire to keep their businesses small and manageable (54 %). Respondents who want to grow the scale of their work and income are more likely to engage in face-to-face interactions with other, local home-based workers (average support rate 3.72 on the 1–5 scale, as opposed to an average response of 3.41 given by those who want their work to remain small). Analogous differences were identified between further responses: growth-focused home-based workers strongly believe such collaboration would improve their incomes (average response 3.92 out of 5), support the need for co-working facilities (3.94), and believe buildings should be designed to work from home (3.79). Home-based workers keen to maintain their work as small demonstrated less enthusiasm towards these propositions: local collaboration as a mean to improve income, proximity to a local centre with co-working space and office support, and innovative ways of house design (all three received an average of 3.55 on a 1–5 scale). Home-based workers who see the important role of maintaining face-to-face contacts with other home-based workers in the area were also more

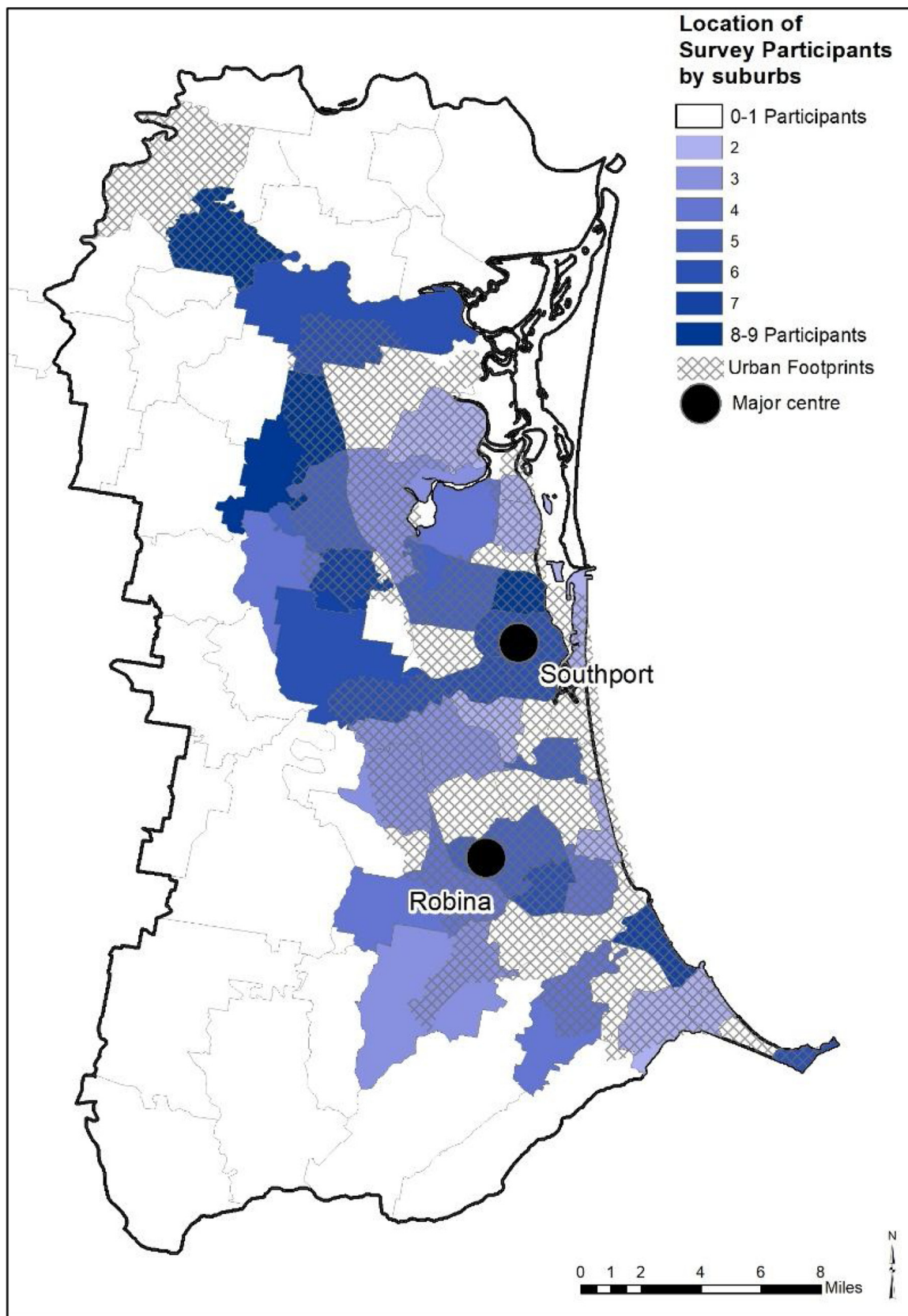
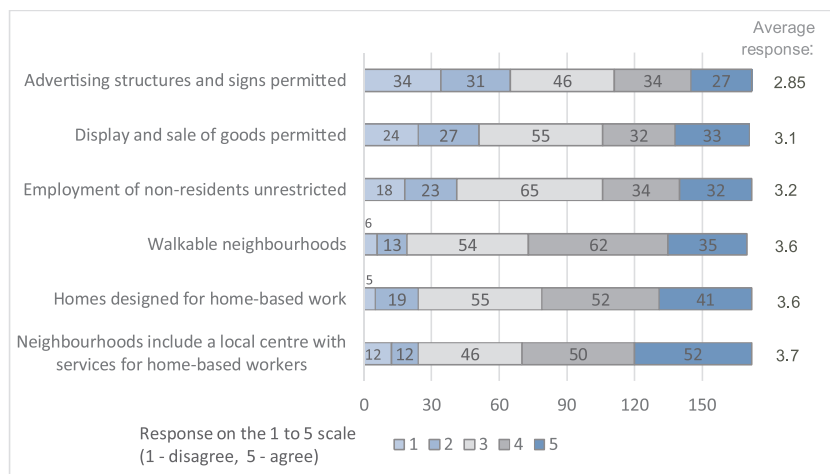
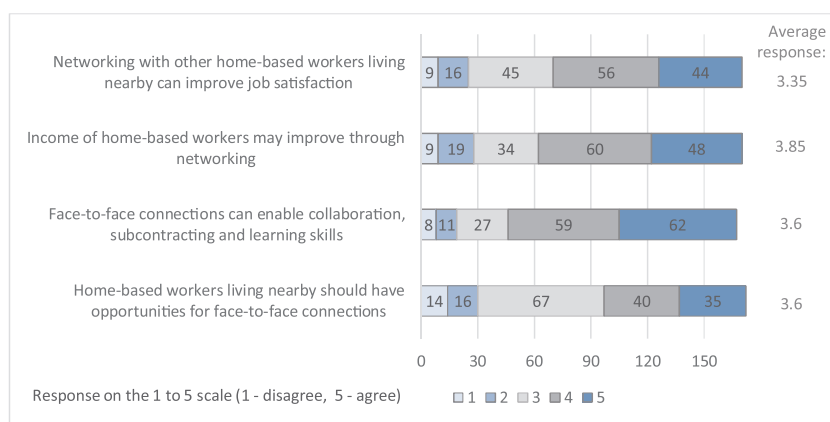


Fig. 4. Spatial distribution of home-based workers in context of the city's urban footprint.





**Fig. 5.** Responses to the question: Do you think that there is a need to design, or re-design neighbourhoods to cater for home-based workers? Indicate if you agree with the following statements on the 1 (disagree) to 5 (agree) scale”.



**Fig. 6.** Responses to the question: Do you think your work would benefit from networking with other home-based workers or home businesses? Please indicate if you agree or disagree with the following statements on the 1 (disagree) to 5 (agree) scale.

likely to agree that their neighbourhoods should include a designated co-working space, meeting rooms and printing services. The suggestion to furnish the neighbourhoods with such facilities was visibly more supported by female home-based workers (68 % of all female participants identified office centre as either important or very important). Among male home-based workers, support for this development was at 54 %. However, there did not appear to be any difference according to age. Responses to questions in this part of the survey were consistent across all age groups.

## 5. Discussion

The two research questions addressed in this paper are challenging from an academic standpoint as they relate to multi-layered and complex matters of cumulative impacts of individual choices, movements patterns and aspirations. The selective nature through which the data was collected means that the study has some limitations which prevent us from making fully representative claims about the direct causal link between home-based work and urban planning. However, these results provide compelling evidence about the desire of respondents to work from home long-term, identify certain impacts home-based work has on residential neighbourhoods, and highlight the preferences of home-based workers towards multi-use precincts. Data and evidence collected through the survey only partially addresses the enquiry about the impacts of home-based workers on certain components of the built environment of their neighbourhood and, in a broader scale, their cities. Findings of this paper can, however, lay the foundation for urban planning recommendations, as well as for further research.

The research presented in this paper was positioned on two pillars: (i) evaluation of home-based workers' past decisions or choices and (ii) their aspirations or needs with respect of the future of work and the neighbourhoods they live in.

The research results came up with three key findings:

- i Strong preference of participants to continue to work from home in foreseeable future.
- ii Limited identified impacts on the built environment of residential neighbourhoods in terms of transport, home modification and residential relocation.
- iii Home-based workers' preference towards multi use neighbourhood precincts.

These findings support [Reuschke and Houston \(2016\)](#) claim that planners and policymakers should pursue the concept of multi-use in neighbourhood planning to foster more flexible and dynamic usage of neighbourhoods and urban districts (also [Alizadeh, 2012](#)).

Over 83 % of home-based workers are 35–64 years old, indicating that this type of work is being pursued by more mature individuals, more likely to be experienced, confident about their skills and valued by their employers, customers or business partners. The survey evidenced that the majority of home-based workers (81 %) intend to work from home in the foreseeable future. Almost half of home-based workers aspire to grow their income through investment, innovative products and employment, whilst the other half is looking forward to keeping their work small and manageable. This is consistent with an earlier study recognizing strong economic viability of home-based businesses in Western Australia ([Wang et al., 2009](#)) and provides an alternative view to [Luckman and Andrew \(2018\)](#) who noted that home-based work may, in certain circumstances, lead to under- and unemployment. The study appears to indicate that increasing home-based work may ease traffic congestions in peak commuting times as the majority of survey participants declared their work do not require to use a car.

Results of the survey offer an opportunity to conceptualize urban planning scenarios for the future of residential neighbourhoods in cities where work will be more dispersed, flexible and online. Whilst such predictions often carry a risk of failure, they may be of interest to the 'Futures' studies, at least in a simplistic 'do nothing – do the minimum – do all' breakdown of scenarios. Under the 'do nothing' scenario, home-based work will likely continue to exist and grow in popularity outside of the urban planning and economic development policy framework. It will retain its apparently desirable social status and will be considerably more frequent in residential neighbourhoods of high socio-economic profile. Social isolation will remain a key challenge for home-based workers and the lack of locally available opportunities for networking and collaboration will persist, often hindering the economic performance of people working from home. Residential neighbourhoods will retain their appeal as dormitory suburbs preferred by families with younger children, characterised by stability and predictability of real estate values, with current planning regulations mitigating potential land use conflicts by way of prohibiting home-based work that impacts the local amenity.

At the other end of the spectrum is the 'do all' scenario. Here, a robust response of planners and policymakers takes place, delivering upon home-based workers' preferences identified within this paper. Under this scenario, land use zoning controls become flexible in the city-wide scale, enabling the development of residential neighbourhoods into multi-use precincts, allowing for co-working spaces and placemaking solutions to enhance the networking and productivity of its residents. The mix of uses in the neighbourhoods results in land-use synergies, where residents become regular visitors and customers of their local neighbourhood centre, retrofitted to become a local hub where residents network, collaborate and access services and amenities necessary for their home-based work and domestic needs. The well-established property valuation system changes with increased demand for workspace in residential dwellings and reduced demand for commercial and industrial space. The evolution of residential neighbourhoods towards mixed-use becomes paired with careful and appropriate compliance monitoring environmental emissions, working conditions in residential buildings and mitigating impacts on the local amenity. Such planning responses also consider the needs of residents who commute to work and value the residential character of their neighbourhoods, adequately mitigating potential conflicts between home-based workers and the rest of the local community.

The middle-ground, or 'do the minimum' scenario involves place-based planning interventions reflecting the level of support to those changes expressed by the local community through appropriate consultation and engagement. A key distinction between this scenario and the 'do nothing' and 'do all' scenarios sits in the role and responsibility it places on individuals and communities in reinventing their neighbourhoods by way of finding appropriate, acceptable balance between opportunities and impacts that home-based work brings about. From a variety of solutions enhancing home-based work identified in this paper, local communities may choose options that would fit into their neighbourhoods and respond to their local needs. Our research indicates that there is no need to develop a plan at the metropolitan scale, even though it is important to promote the development of mixed-use neighbourhoods, but rather do small placemaking interventions in neighbourhoods characterised by a significant concentration of home-based workers. Given our results, an appropriate planning response would be the consolidation – through placemaking interventions – of existing clusters of home-based workers in mixed-used suburbs that already have a significant concentration of those workers. This could be done through the provision of a building/space that would reinforce the status of those neighbourhoods as "places" for home-based workers, at minimum cost for the city. This space could be a co-working space, facilitating face-to-face interactions and hosting events to tie up the community of home-based workers in the city. Our recommended planning response is therefore minimal and would focus on a placemaking intervention to strengthen the status of an existing neighbourhoods in the city. In terms of the design concept, this placemaking intervention could use the concept of a third place, similar to "Cantine" that has been implemented in Paris in 2008 and is affiliated with other similar structures in San Francisco or Barcelona, thus also fostering international networking between workers in the digital economy ([Le Barzic & Distinguin, 2010](#)). The aim of such third place would be to pool resources and skills among entrepreneurs and act as a place for exchange and synergy between home-based workers. As defined by [Le Barzic and Distinguin \(2010\)](#) the concept is to create a meeting place for face-to-face interaction in the context of the digital economy. From a policy perspective, this third place could also respond to other problems of contemporary cities by taking cars off the roads and promoting walkable, safe neighbourhoods. Development of such places would consolidate the status of the City of Gold Coast as a home-based work hub at the national level and also possibly on an international scale.

## 6. Conclusion

Our survey collected evidence that home-based work in residential neighbourhoods is growing, it can be multi-layered and complex, and should be considered as spatially and economically significant. From the planning policy perspective, it appears prudent to go beyond planning for residential neighbourhoods where the only commercial activity is the local grocery and newsagents. This research also provides evidence that home-based workers want to live in vibrant communities where they can swap ideas, exchange knowledge and share experiences with other like-minded workers. Whilst further research is needed to understand impacts of this evolution on the amenity of residential neighbourhoods, certain policy recommendations are put forward within this paper. First, this calls for local policymakers to re-examine ways to achieve flexibility in planning decisions, for instance, to facilitate the emergence of a 'third place' in neighbourhoods with high proportion of home-based workers. Further, there is a need to revisit current planning controls and the extent to which applicant-led rezoning could help achieve the balance between certainty and flexibility, for example, the extent to which it could facilitate retrofitting of existing suburban retail precincts toward neighbourhood centres with village-like formats. These centres, depending on the size of the neighbourhood and the needs of the local home-based work community, can also accommodate such third place, provide meeting spaces, office supplies and varied dining options. Lastly, local councils should review their building approval policies to allow for shorter, more responsive plan making process, in this case, a streamlined process for redevelopment of dwellings to accommodate a designated workspace. For urban planning strategies to be more responsive and transparent, there should be ongoing conversations with community members through regular information sharing and networking events engaging and involving home-based and small businesses. When communities are engaged all throughout the process, their needs are considered and respected, ensuring that changes are implemented at an appropriate pace and are supported by the local community, in consideration of residents who do not work from home. After all, planning is an activity that is firmly concerned with achieving the greatest good for its multiple publics, including the increasing home-based work communities in cities.

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