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Knowledge workers in residential suburbs: urban planning and design for nomadic work and innovation

Abstract

Work and workplace in cities are changing, due to ongoing technological advances, shifting demography, new lifestyle preferences and the growth of the knowledge economy based on human capital. Whilst the role of cities' central business districts as facilitators of knowledge and co-location of entrepreneurs continues to strengthen, ongoing growth of home-based work and remote/nomadic work brings economic activities into the residential neighbourhood. Little is known about the role of these new work modes on spatial transformation of cities' residential neighbourhoods, often planned with the intentional separation of land uses.

This paper offers insight into the role of home-based work and nomadic work in ongoing urban transformation within cities. Our research used a combination of qualitative and quantitative methods structured to identify design personas and assist in formulation of neighbourhood design options fostering home-based and nomadic work practices. Data for the research was collected through interrelated online surveys and design charrette workshop conducted in the City of Gold Coast, Australia.

It appears that most home-based workers and remote/nomadic workers work individually but see a need for urban planning interventions facilitating transformation of residential neighbourhoods towards multi use. Alternative design concepts are suggested within this paper, offering actionable knowledge for city policymakers and planners.

1. Introduction

The new economy relies heavily on the benefits of spillovers and synergies. As put by Edward Glaeser (2011), the importance of both has strengthened the role of places within cities where people come together to share ideas, places which facilitate an 'urban buzz' and face-to-face contacts that can lead to a higher knowledge-based economic productivity. Synergies are more likely to be realised when people meet each other and interact, than if urban life is atomised and siloed (Haskel and Westlake, 2017, Felton et al., 2011). Therefore, it would appear that urban spaces at every level – including a local neighbourhood – should be somewhat engaged in a collaborative mechanism to support city's competitiveness (Esmaeilpoorarabi et al., 2016, Bilandzic et al., 2018). Whilst central business districts in cities offer environment for knowledge-based collaboration, surrounding residential neighbourhoods were never meant to perform that role. Yet, due to ongoing technological advances, changing lifestyle preferences and globalised networks of knowledge, work – more dispersed and flexible – becomes more common feature of residential neighbourhoods. In fact, suburbs in cities are going through the process that Australian demographer Bernard Salt described as "a quiet revolution" (NBN, 2017), where more and more people undertake home-based and nomadic work practices. However, do people working from home, or remotely from 'third spaces', really want places that facilitate synergies and spillovers? Would such places be beneficial for their work? What placemaking interventions would be required in residential neighbourhoods? These questions have formed a territory for our research into the growing popularity of home-based

and remote work in cities' residential neighbourhoods and the scope of appropriate urban planning and urban design response.

This paper presents outcomes of one stage of this research, which had a form of a design charrette workshop, where we invited local home-based workers, remote workers and local government planners, to jointly share their experiences and conceptualise residential neighbourhoods fostering remote work. The overarching research question of the design charrette was: How do the remote and home-based workers conceptualise the residential neighbourhoods fostering and enhancing their work?

We conducted this workshop at a co-working space located in a mixed-use precinct along Gold Coast Highway, the main arterial road linking the coastal suburbs and urban centres of the Gold Coast in South-East Queensland (Australia). Abundance of co-working spaces in this area – none of them were around few years ago, today many operate at full capacity – illustrates the rapid changes of work and workplace in cities (Bilandzic, Foth, 2017), which is at the centre of our research project. The following sections of the paper include a literature review and description of the methodological approach to the research, detailed overview of the design charrette workshop, followed by presentation of results and concluding discussion.

2. Literature review

A series of recent studies has identified that economic activities increasingly appear in the outer-suburban areas of cities. Florida and Mellander (2014) noticed that start-up activities are not only concentrated at the metro level but also frequently appear in neighbourhood-level micro-clusters. Studies of Lüthi et al. (2013) and Felton et al. (2011) identified ongoing decentralisation of cities' economic activities, pointing to increased creative industries establishments occurring in the outer-suburban areas. Felton et al. (2011) further noted that these decentralised economic activities require alternative planning strategies than those utilised in policies fostering inner-city networks. Ciolfi and de Carvalho (2014) did a more focused research into these emerging forms of work, concluding that one of their key characteristics is the potential – and the need – for "nomadic" practices. In another study, de Carvalho et al. (2011) labelled this type of work as *modern nomadicity,* noting that it involves engaging with work activities across different locations based on the availability of the resources that are necessary for accomplishing them. The growth of popularity of nomadic work appears to be paired with the growth of home-base work (Mason, 2011, Reuschke and Houston, 2016, Holliss, 2015). The increasing popularity of emerging economic activities outside of cities' central business districts (Dery and Hafermalz, 2016) is often described as a by-product of changing lifestyle preferences and disruptions to global economy, based on innovation (mobile connectivity, social media, cloud-based technologies), knowledge and human capital (Moretti, 2012).

The latest Australian census data shows that the growth of home-based workers outpaces the overall workforce 25% to 10% (ABS, 2016 and ABS, 2011, based on the number of residents working from home). Interestingly, the distribution of home-based and nomadic workers in suburbia is not even. Contemporary measures of entrepreneurship like the self-employment rate show sizable differences across and within metropolitan areas (Glaser, 2007). But what drives nomadic and home-based workers to certain locations? In a comprehensive review of contemporary theories on location of workers, Storper and Scott (2009) noted that the locational decisions of people are made chiefly in response to 'amenities', that is certain features of the urban environment. These include housing choice, broader local environment, public spaces of a certain kind, all manner of opportunities for local interactions, educational institutions and broader economic prosperity of the area/city. This theory has been echoed in a study of Buch et al (2014) which also pointed to the role of natural

attractiveness, availability of consumer facilities and public goods. There is also a variety of non-urban factors influencing locational decisions, such as life cycle, one's economic constraints and preferences for leisure or the role of social networks including extended family (Storper and Scott 2009, Musterd et al, 2016, Frenkel et al, 2013). Unfortunately, research dedicated to location preferences of nomadic and home-based workers is scarce. Some insight into the matter comes from the work of Edward Glaeser who found that the presence of customers seems to be relatively unimportant for self-employed workers (Glaeser, 2007). Davidson (2018) observed that home-based work in cities is likely to be spatially concentrated, with demography and socio-economic status being amongst the key locational factors. This spatial concentration may be attributed to the existing models of urban structure and associated sectoral occupational classification of its residents (Moos and Skaburskis, 2007, Brennan-Horley, 2010). Reuschke and Houston (2016), examining location of home-based businesses observed that their spatial concentration is more likely to increase because of shared trajectories leading people in the same place to become self-employed, rather than the implied spillover effect.

But this spatial concentration is not the same as clustering. As put by Freeman (1994), enterprises need continuous interactive learning which occurs through formal and informal relationships between them. The knowledge economy (Hearn 2014, Yigitcanlar and Inkinen, 2019, Potts, 2012) relies heavily on the benefits of spillovers and synergies (Glaeser 2011). The importance of both has strengthened the role of places within cities where people come together to share ideas, leading to increased productivity. Such synergies and spillovers are more likely to be realised when people meet each other and interact (Bentlage et al., 2013, Haskel and Westlake, 2017, Felton et al., 2012). Yet, nomadic and particularly home-based workers do not always have such opportunities; despite their seemingly high social status, they report social, professional and physical isolation (Bartel et al., 2007). Opportunities to mitigate this sense of isolation and ensure nomadic and home-based workers can fully participate in the knowledge economy remain to be identified. This task is urgent, as recent research considers place-based ecosystems as critical urban features driving growth of the knowledge-driven innovation economy (Florida et al., 2017). In response to the emerging economic activities in the suburbia, researchers call for positioning residential neighbourhoods as networked spaces facilitating work (Folmer and Kloosterman, 2017, Brennan-Horley 2010). Such neighbourhoods however require development of alternative planning strategies fostering more flexible and dynamic use of neighbourhoods and urban districts (Reuschke and Houston, 2016, Alizadeh and Sipe,2013).

3. Methodology

The design charrette was a component of a broader research project focused on formulating appropriate planning and design responses accommodating remote and nomadic work in residential neighbourhoods. This research project commenced in 2016 with description of the geography of home-based work in Australian cities, which identified the Gold Coast as a city with the highest proportion of this form of work (in publication). The City of Gold Coast subsequently became a case study area for the online survey, which enquired about home-based workers' daily patterns, impacts on the built environment, and aspirations with respect of their residential preferences. Responses received in the survey (in publication) triggered a need for a further, more detailed qualitative examination into the scope of urban planning, design, and placemaking interventions required in the neighbourhood. We used the design charrette model (Roggema, 2014, Schuler and Namioka, 1993) for this component of the research. Given that the design charrette sought to engage with remote workers, we adopted participatory design as the most suitable research method for this part of the study. Participatory design emerged about 25 years ago in Scandinavia as a distinct set of design and

research practices (Gregory, 2003) aimed at collaboration between designers and users in pursuit of improving the quality of working life (Halskov and Hansen, 2015). One of the key features of the design process in this method is an appreciation for the fact that design should be an iterative process, where emerging ideas are tested in real work situation (Eriksen et al., 2016). Recent years saw evolution of participatory design towards concerns about improving quality of life in a broad sense, with many participatory design practitioners engaging in urban and public contexts. Human-centred participatory design has also become a method utilised by many local governments in recent years (Clarke et al., 2019, Foth 2018, Foth and Brynskov, 2016). (Heitlinger et al., 2018).

The design charrette was conducted by researchers from the Urban Informatics research group in the QUT Design Lab. The Urban Informatics team specialises in "research exploring design, and practice of urban experiences across different urban contexts that are enabled by new opportunities of technology mediating the physical and digital layers of people networks and urban infrastructures" (Foth, Choi, & Satchell, 2011). From a methodological standpoint, data captured in the design charrette was analysed using the interpretative phenomenological analysis method, developed by British psychologist Jonathan Smith (Smith, 1996). The overarching focus of this method is with exploring people's lived experiences and the meanings people attach to those experiences (Braun and Clarke, 2013).

3.1 Recruitment of participants

We recruited the participants from two sources. The first source was the database of home-based workers who completed an online survey for the previous stage of the research, in 2017. The second one was the design charrette venue with a couple of remote workers working from Karma Collab Hub expressing interest in the event.

3.2 The design charrette

Design charrette is a collaborative design and planning workshop, usually held on-site and inclusive of all affected stakeholders (Lennertz and Lutzenisher 2006). In preparing the design charrette, the authors followed four rules formulated by Roggema (2014):

1. Design with everyone. The design process is integrative and contains a variety of possible solutions. In the charrette, everyone is a designer.
2. Start with a blank sheet. Participants are here to agree on a shared vision of the future, without any preconceived ideas.
3. Provide just enough information. Too much information causes decision paralysis and too little produces bad proposals.
4. The drawing is a contract. All drawings produced during the charrette embody the consensus as experienced and achieved by the charrette team. They form a well-understood agreement, or contract, in images amongst the group.

This particular workshop method was chosen because of its several advantages (after Roggema, 2014), such as the ability to use technical data in a creative way, develop design ideas based on the uncertainty and unpredictability, speculate about future change and ways of living and work "bottom-up", relying on the local experience and knowledge. We intended to gather community members, entrepreneurs and local government planners in an attempt to create a mutual understanding and ownership between all participants. We held the design charrette on 14 May 2019 at Karma Collab Hub, a co-working space in the City of Gold Coast, located in a mixed-use precinct along Gold Coast Highway. Built in the 1960s, the highway runs parallel to the Pacific Ocean, passing through key popular tourists destinations, commercial centres, residential areas and the

local airport. Most of the urban landscape along its 39.8 kilometres length bears a legacy of transport planning from mid-20th century: up to three lanes in each direction and very few interruptions such as pedestrian crossings make sure that cars can move quickly; a thin strip of industrial and commercial buildings separates the road from nearby residential and tourist areas. The eclectic land use mix along this road – a combination of industry, commerce, tourism and residential land of all densities – has provided a fertile environment for all sorts of new commercial establishments, spontaneously giving a new life to this urban landscape. Many large, single- or double-level industrial buildings have been recently converted to design studios, niche breweries with taprooms, modern cafés and co-working spaces for the local self-employed or teleworking residents. There are multiple co-working spaces in this area, which illustrates the rapid changes of work and workplace in cities (Bilandzic, Foth, 2017). Participants recruited for the design charrette were comprised of a good mix of age groups (young entrepreneurs to semi-retired professionals), gender and occupations (from IT software developers, through business consultants to a home-based cake and pastry maker).

We opened the design charrette with the "wall of ideas" exercise: a relatively easy, introductory task with questions about daily working patterns and behaviours. Some example of these questions were "what times of day do you work?", "do you have a designated workspace at home?" and "what interactions with other people do you need in your work?" These questions were followed by an enquiry into ideas about the future of their own work, as well as remote work in general: "What if your local shopping centre had a co-working space?", "what if the scale of your work grew considerably? Would you continue to work remotely or move to an office premise?" This initial part of the design charrette paved way to a group conversation about the future of remote work in residential neighbourhoods, with participants asked to formulate a vision statement for this future, accompanied by five priority actions implementing this vision, key challenges and opportunities.

Photo 1: Design charrette workshop, Gold Coast, May 2019

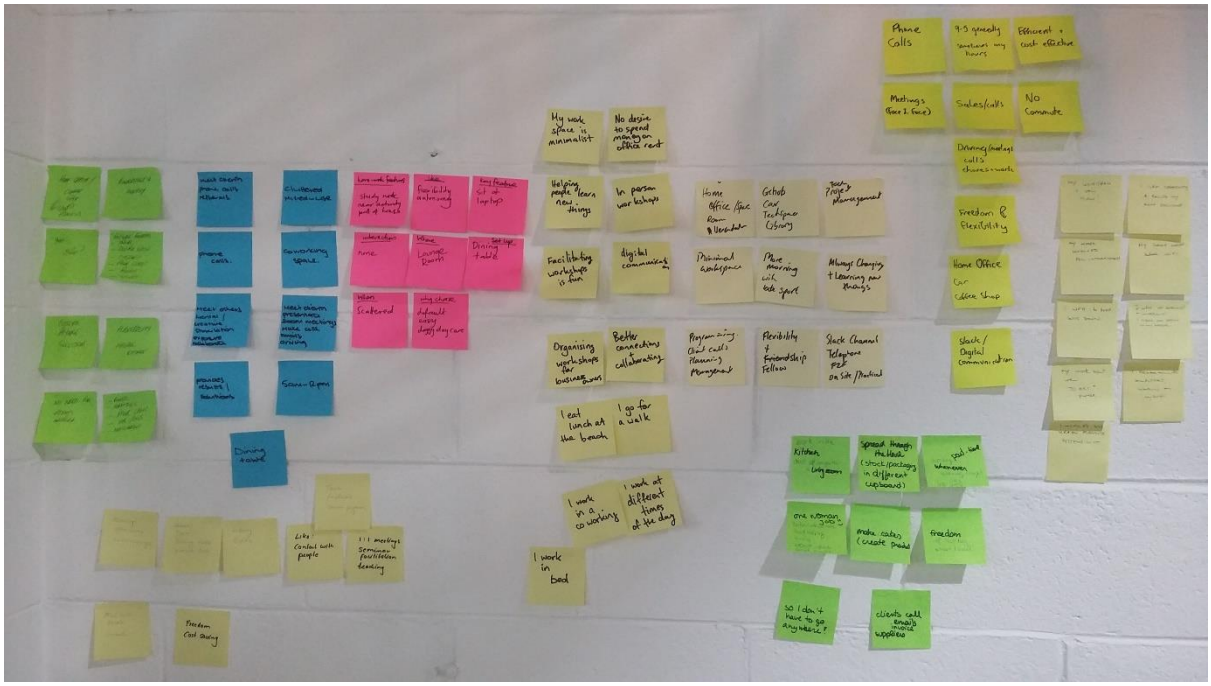

Photo 2: "Wall of ideas" exercise

Next, the charrette focused on the "design persona" exercise (after Foth et al., 2011, Cooper 1999), where participants attempted to conceptualise key types of remote workers, identifying them by their behaviours. We chose this exercise for its ability to deliver consolidated opinions and recommendations enabling focused planning and design solutions. Personas are fictional characters, created to represent different types of behaviours. They do not describe real people but are composed based on real data collected from workshop participants. Creating personas helps understand behaviours and experiences of nomadic and home-based workers, providing meaningful points of reference to assess design ideas against (see Interaction Design Foundation, 2019).

Photo 3: Design persona exercise

The final component of the workshop involved a mapping exercise. Participants were handed A3 maps of Gold Coast neighbourhood of particularly high proportion of remote workers (as measured through the 2016 Census of Population and Housing).

Photo 4: Mapping exercise

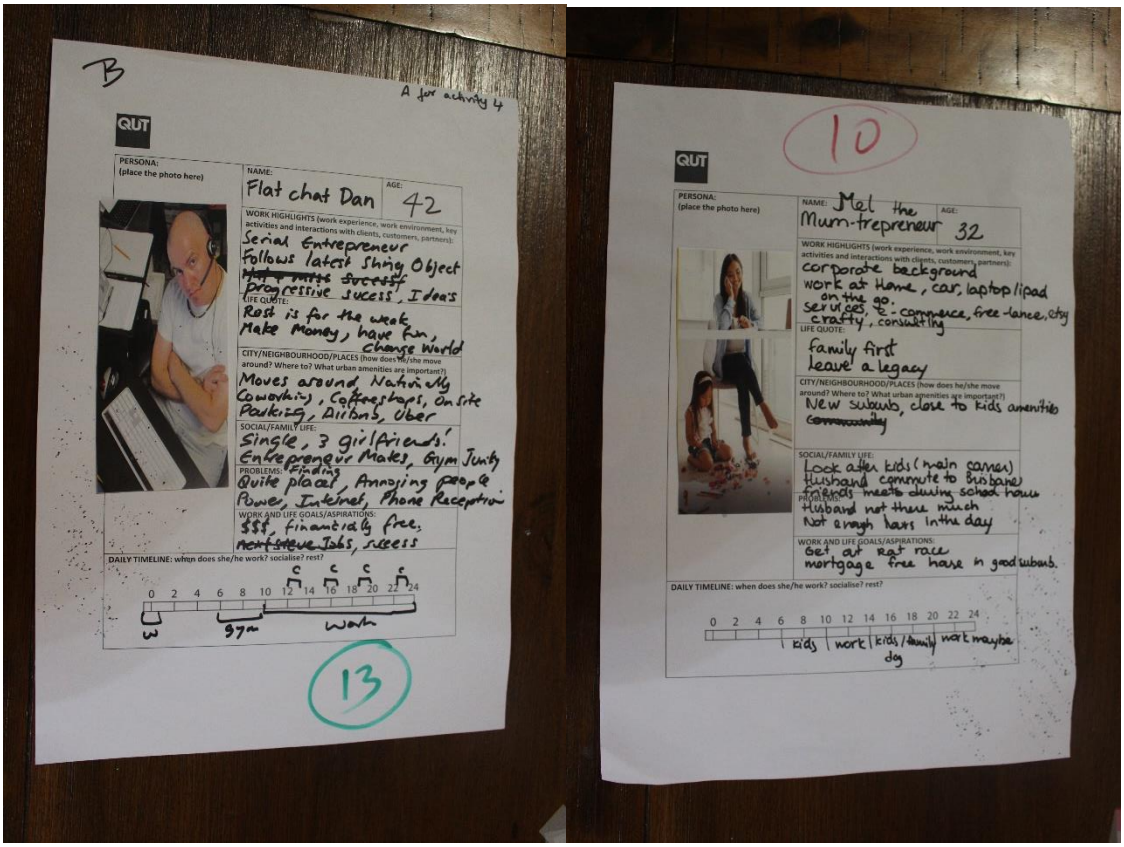

Photo 5 and 6: Design personas: Flat chat Dan and Men the Mum-trepreneur

4. Results

Through the opening "Wall of Ideas", participants revealed that they perceive remote work as a panacea for certain urban problems, such as congestion, environmental pollution or work/life balance conflicts ("get cars off the roads, promote virtual reality tools to facilitate videoconferencing. Have more family life instead!"). They also advocated for the growth of co-working spaces, suggesting that remote work could be subsidised by the public sector as it may mitigate some of the urban problems. As an alternative to these publicly subsidised, privately operated models, some participants identified community centres and public libraries as places, which could further evolve towards co-working hubs (Bilandzic and Foth, 2013). Regardless of the model, participants identified a need to connect those places with public transport. An idea to locate a co-working space in a local shopping centre was put forward as a relatively convenient and central location. This was considered an interesting idea, with many participants declaring they would be keen to use such facility. At the same time, concerns were raised that mixing work with a shopping destination is not appropriate ("too loud there", "I would look at it but not too keen").

The "Wall of Ideas" exercise also sparked conversations about the future business growth. Participants indicated that, should any growth scenarios eventuate, they would be likely to continue to work remotely. Amongst a variety of solutions helping them manage their growing business needs, they identified co-working places and technological solutions like virtual assistants and virtual reality ("hire more remote workers, stay remote! Use delegations and promote staff internally", "hire virtual assistance").

The design charrette participants were also keen to pursue resource sharing. Carpooling was put forward for discussion, revealing a high level of support to this idea ("I would share my car for sure!" "Definitely! Electric!").

The participants were either home-based workers or remote workers, questions about their daily experiences varied particularly with respect of the way their workplace is organised. Those who work from home either stated they have a designated, organised workplace ("my work space is minimalist"), usually in a separate room, or carry out work activities from anywhere at home ("my work is spread through the home", "I work in bed"). Both home-based workers and remote workers enjoyed working from a third place, such as a co-working facility, library or café. When asked about key reasons for undertaking remote work, and why they enjoy this particular way of working, responses consistently pointed towards cost-efficiency and autonomy ("freedom of doing what I want", "flexibility and autonomy" or "I keep the costs down"). These responses were accompanied by many statements praising their independent lifestyles, such as "I eat lunch on the beach" or "I take my dog for walk between work tasks". Responses also highlighted a high level of enjoyment associated with working for, or with, other people ("I like meeting others and collaborate", "I like helping others"). Remote workers appear to be busy ("I work 70+ hours a week") and on the move, with driving and face to face meetings consuming lots of their time, despite employing online communicators like slack channel or zoom.

In the next stage of the design charrette, we asked the participants to reflect on all ideas and experiences that they shared so far and, in two groups, prioritise them into themes titled "must have", "should have", "could have" and "won't have". Interestingly, both groups, whilst working independently from each other, managed to sort ideas and experiences in a similar way, grouping lifestyle-related matters in the "must" group and broader neighbourhood or city-wide propositions in the "should" or "could" themes. As such, priority matters ("must have!") included flexibility of time, bigger workspaces, low noise levels, fresh air and comfortable furniture. Amongst the "should" or "could" themes, remote workers identified community outdoor central spaces, car-less

neighbourhoods, nearby café, availability of charging stations and opportunities for local networking. Participants agreed that matters that are definitely off the table include workspaces that are noisy, located in soulless buildings and involve any form of a dress code.

Building on the "Wall of Ideas" and the "must have – won't have" exercises, we asked the participants to create design personas. Working in two separate groups, the participants developed two sets of personas, each of them comprising of three types. Once again, similarly to the previous exercise, both groups worked in isolation from each other, but delivered very similar results, which can be presented as follows:

- Persona 1: Flat-Chat Dan. Middle-aged male, creative, well-educated professional passionate about his work, utilising contemporary technologies as tools enhancing his work. Works long hours, remotely from co-working facilities, with random patterns across the day to math his lifestyle and free-time interests.

- Persona 2: Mel the Mum-trepreneur. Stay-at-home mother. Entrepreneurial and independent, works from home, part-time, trying to combine family commitments with career. Uses her previous (pre-children) professional experience to pursue career, trying to maintain vibrant and engaging work.

- Persona 3: Dilbert Unleashed. Generation Z, true digital native in his early 20s, exposed to the internet, social networks and mobile systems from earliest youth. Very fluent with integrating virtual and offline experiences, however this does not translate to tangible income or profit. "Comes to co-working space and talks a lot", "brings laundry to his mother" or "fake it till you make it" were main lifestyle characteristics describing this persona.

The concluding mapping exercise saw to conceptualise the built environment enhancing work and lifestyle of the personas. We provided both groups with maps of established residential neighbourhoods in the City of Gold Coast. Both neighbourhoods are characterised by a high proportion of home-based workers and predominantly residential character. In this exercise, the participants focused on placemaking interventions, seeking to integrate opportunities for active transport ("bicycle storage", "safe footpaths") into the established residential character of their case study areas. Both groups identified a need to provide co-working facilities along the local main road, but in certain distance from larger shops and services.

5. Discussion

We focused the literature review of this paper on discussion around the changing nature of work and workplace in cities, highlighting the growth of nomadic and home-based work in suburbia. The design charrette contributes to this discussion through the following, key findings:

- Nomadic and home-based workers display a very high level of satisfaction with their work, identifying freedom and flexibility amongst the main benefits, whilst pointing to social isolation and lack of contact with like-minded professionals to be the main drawbacks,

- Despite high level of satisfaction, home-based and remote workers lack time and opportunities for self-learning and development,

- Workshop participants identify a need for placemaking interventions at the neighbourhood scale, to mitigate the isolation. Such interventions could include a co-working facility or a 'third space' in a convenient, central location of their neighbourhood, facilitating meetings, networking and collaboration,

- Remote and home-based workers have progressive preferences towards innovations that would further augment participants' work/life balance, with virtual meetings, online communicators and carpooling identified as beneficial to their work and lifestyle.

We see the last two findings as an interesting blend of physical, placemaking interventions enabling face-to-face contacts with technological improvements enhancing online collaboration. Given that home-based work and remote work in cities are not evenly distributed but appear co-located in areas of certain socio-economic features, urban planning response should be tailored to respond to specific needs of the local communities. It is particularly the younger generation of home-based and remote workers who seek changes to the built environment as opportunities and solutions enhancing collaboration and networking amongst home-based workers and remote workers. They tend to live closer to the city centre and identify a need to increase collaboration, networking and face-to-face interactions with other, like-minded people living locally. The urban planning response should focus particularly on creating Florida's place-based ecosystems (Florida et al., 2017) driving growth of the knowledge-driven innovation economy through knowledge dissemination and opportunities for collaboration across the local community of remote and home-based workers. A central role in such ecosystems would be a co-working facility or a 'third space'. Planning for such ecosystems should also consider convenient active transport opportunities, minimising car-related transport. Further, workshop participants advocate for building design accommodating home-based work in new residential development projects.

6. Conclusions

The growth of home-based work and remote is part of ongoing, broader process of decentralisation of economic activities in cities. It is also a product of changing lifestyle preferences, facilitated by technological advances. Relative isolation and lack of established networks hinder the ability to engage with home-based and remote workers, to accumulate sufficient evidence that would enable adequate planning response. Our research partially covers this knowledge gap. Whilst remote and home-based workers engage with and use latest online tools facilitating work-related communication, they also identify a strong need for places within their neighbourhood for face-to-face exchange of ideas, synergies and spollovers, as they happen in cities' central business districts. Delivery of such places appear to not only respond to, and enhance their work, but also improve their work-life balance, reduce local road congestions. Further research is needed, both with the remote workers and local government planners, to formulate appropriate planning strategies.

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