NEIGH BOUR HOODS OF THE FUTURE

DESIGN

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Time for housing designers to flex their creative muscles

Jeremy Myerson
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Britain has a unique capacity for shooting itself in the foot when it comes to homes and neighbourhoods for older people. According to research submitted to the Government Office for Science Foresight report 'Future of an Ageing Population' (2016), housing stock in the UK is not well adapted to older people, and there are many mismatches between their needs and the homes they inhabit.

Mainstream homes are often the wrong size for later life, are difficult to manage and maintain, and don't support the many physical changes that accompany old age. Even the most basic considerations such as level access, wide doors and entrance-level toilets are missing in 95% of English houses. Poor lighting on landings and stairs invite accidents; lack of insulation, damp penetration and weak heating contribute to ill health.

A shortage in provision of specialist, smaller homes for older people results in many being unable to downsize at any point before a crisis in support that catapults them into institutional care. As a result, many family homes are under-occupied at a time of significant housing shortage in Britain.

Outside the home, things don't improve. Despite research showing how a supportive neighbourhood is intrinsic to domestic wellbeing, there is frequently a lack of step-free access, ramps, handrails, seats at regular intervals, working toilets, properly maintained surfaces and removal of seasonal hazards of autumn leaves and winter snow. The result is that many older people are left prisoners in their own homes.

Rethinking the home

When I joined the Government Office for Science's academic panel to review the evidence and make recommendations to policymakers on how to manage an ageing population successfully, there was a broad consensus that smarter housing – and the technology that enables it – should be right at the top of the agenda.

Subsequently I used some of the data and insights gleaned from the Foresight report to curate an exhibition for the Design Museum, New Old – Design for Our Future Selves. This is now on an international tour. In my contribution to the first Neighbourhoods of the Future publication, I showed some of the exhibits I commissioned from leading design firms, including a 'power suit' to aid mobility and a reimagining of the mobility scooter as a nifty, desirable inter-generational vehicle.

Now, however, I increasingly believe that while single innovations can act as creative beacons for change, usefully fill market gaps and address different needs, there should be a more comprehensive design systems-led approach to the structural failings of Britain's fallible and inappropriate housing stock.

In the same way that architects, designers and manufacturers of everything from IT to furniture in the office environment have formed a broad coalition to reshape the workplace to improve employee wellbeing and productivity, so we need a similar revolution in thinking about our homes and neighbourhoods for older people.
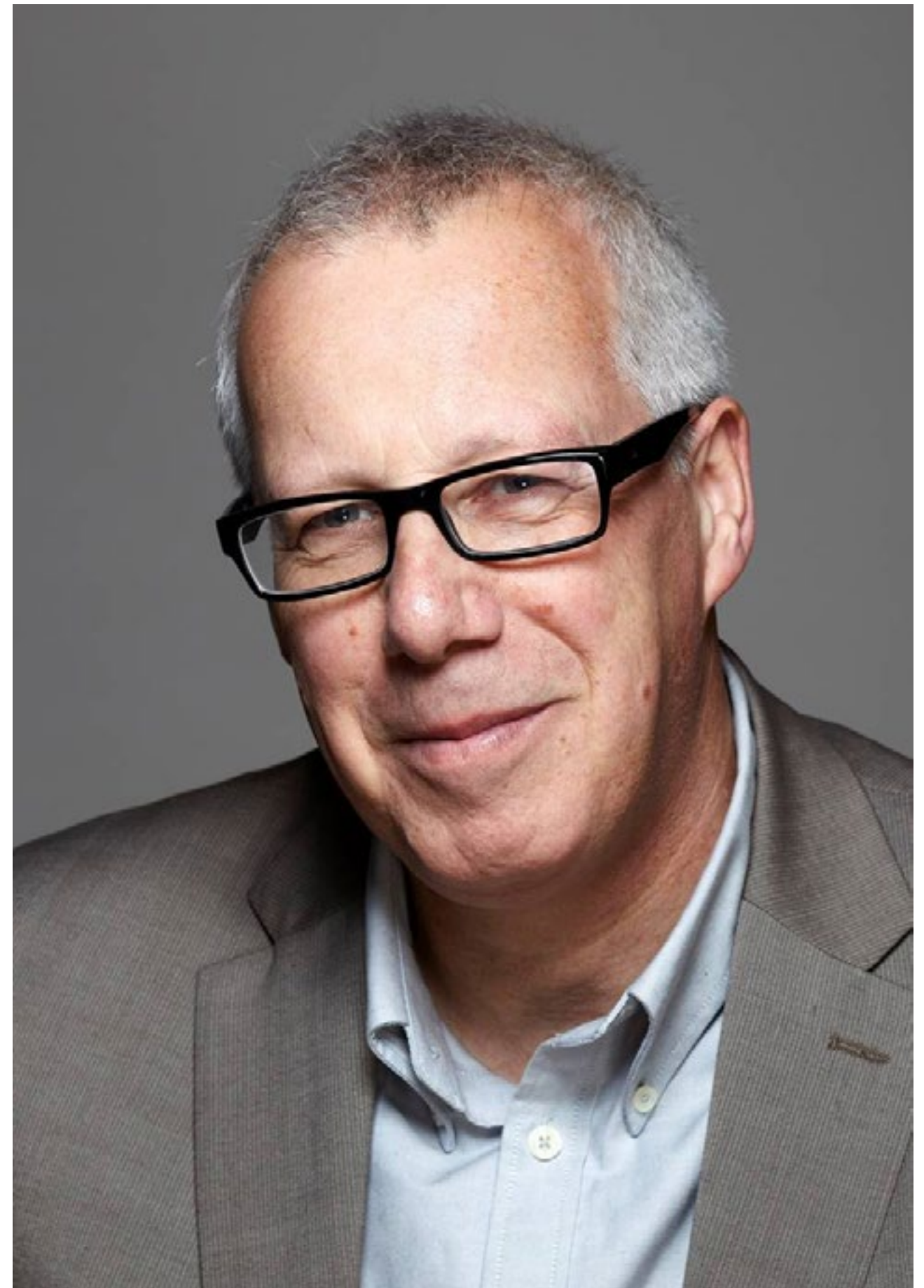
Britain has to do much better in matching our housing stock to the needs of older people, and stating some big, bold values is not a bad place to start.

The value of the FLEX model

One of the design models I've developed for the office environment could be applied equally well to lifetime homes. This is a model that looks at making spaces and settings more adaptive and agreeable for their users – it is called the FLEX (Flexible-Legible-Experiential-Comfortable) model.

Flexibility means building in interior elements that adapt more easily to changing and unpredictable requirements over time. Legibility refers to local environments that are more easily understood and intuitively 'read' and navigated by their users, incorporating visual cues to make that happen. Experiential spaces are designed to project warmth, atmosphere and a protective mood – they offer a good experience. Finally, spaces that are really comfortable make people feel welcome, relaxed and supported.

It isn't difficult to see how these values could transfer readily to homes and neighbourhoods for our ageing society. We need a whole system approach to planning, procurement, co-design and build to deliver a new generation of homes that flex as we age, are easy to understand and manage for residents, offer a great living experience with opportunities for social interaction with others, and provide real comfort, peace of mind and dignity in terms of giving support and protection in later life.

Just a pipe dream? Not all. Britain has to do much better in matching our housing stock to the needs of older people, and stating some big, bold values is not a bad place to start.

Photo credit: Images courtesy of Jeremey Myerson and The Royal College of Art MA Architecture programme – Ohyun Kwon

Short Term Housing for New Labour in Seoul

Platform design has transformed the automotive industry – Could it do the same for housing?

Kieran Singleton
Co-founder, Forge Design

The UK is facing an acute housing shortage. A better use of modern construction processes and materials could fix this, enabling thousands more homes to be built faster, cheaper and more efficiently – and potentially transforming the quality and specificity of UK housing. Yet as things stand, our dependence on bricks and mortar suggests a sector that is technologically moribund. Are there lessons to be learned from the successes of the automotive industry?

Car manufacturers first recognised the benefits of platform manufacturing decades ago, to meet the challenges of increased product complexity, customisation, build quality and technological cost. Today it is standard practice.

The housing market embraced mass pre-fabrication in the post-war period, to address urgent housing needs. However, its legacy was compromised due to the quality and utility of the resulting buildings, and a lack of emphasis on user-centred design.

So why has technological innovation flourished so well in the automotive sector, while in housing it has seemed to stagnate?

Reasons may include a lack of customer choice and competition. The automotive market is fierce in terms of features and cost, and auto manufacturers have had to adapt their systems to survive. A manufacturer that doesn't compete ruthlessly on quality, feature content or price will quickly go out of business.

Better design has been central to this effort. Car companies invest millions to ensure cars are desirable. They must be evocative, thoughtfully ergonomic, beautiful in form as well as function. Cars are emotive as well as functional and high tech, yet mainstream housing has never been marketed in quite the same way – and its processes have never been under the same pressure to evolve.

Platform design

To make better products more affordable, it is standard practice in the automotive world to try and maximise the amount of inter-vehicle commonality. This extends to the structural layout, with common chassis and structural components, to the powertrain and running gear, and to any parts that carry a high development or tooling cost, such as electronic switch-packs, wiring harnesses and data distribution systems.

This level of standardisation could have led to a conveyor belt of similar products and a huge reduction in user choice. But, by employing good design, manufacturers have taken advantage of the platform approach to deliver exciting new concepts, embraced by the public at both ends of the price spectrum.

By way of example, the Fiat mini platform, which underpinned the reincarnation of the Fiat 500, was also used by the Ford Ka of the same period. This case is particularly

interesting, with the Fiat outselling its sister vehicle by a factor of 2.4 in the first three years. These sales were achieved almost entirely due to the design and market approach, and by investing in customer touchpoints, such as the interior layout and interfaces. They also came despite a higher price point than the Ford.

Forge Design, our global design company, is formed from experts in automotive design and concept design management. Our community has been involved in conceiving and designing the look and feel of vehicles ranging from modern city cars to supercars. One such example that perfectly exhibits this platform approach is the new Bentley Continental. This car shares its MSB base platform with the Porsche Panamera, allowing both companies to minimise fixed costs while preserving the highest standards of premium feel, and bespoke variation in customer experience.

Visually, these cars do not look alike – they are quite distinctive. Furthermore, the new range of Continentals reflect the current emissions-conscious trend. They feature structural components made from exotic high-strength steels to reinforce an aluminium body. This delivers a considerable weight saving, improving performance and reducing fuel consumption. The increased cost of these expensive materials is only sustainable using platforms. Could the same be true for housing?

> We take it for granted that new cars will be well designed, that they will arrive on time and that when they do, they will not leak. Is the same true of the home buying experience?

Key:
- Vacuum structural (aluminium)
- Extrusion profiles (aluminium)
- High strength steel
- Sheet aluminium
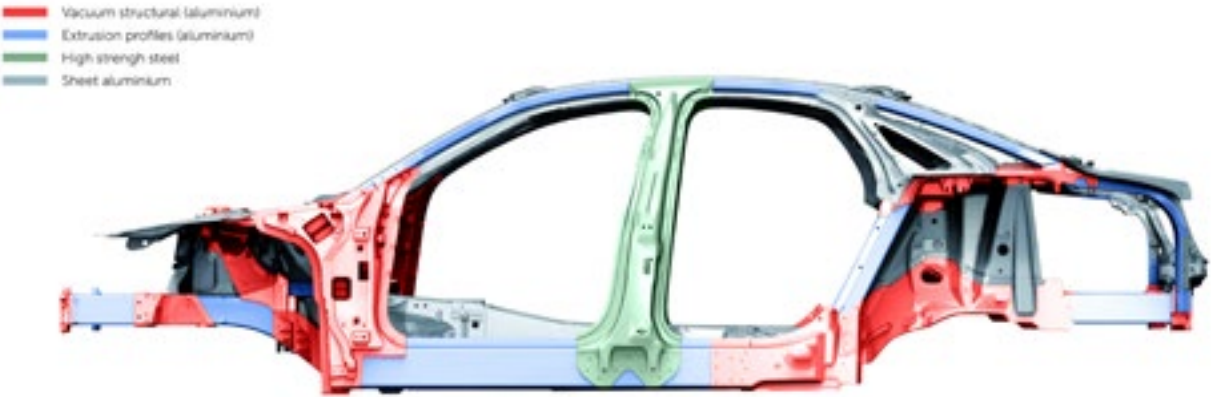
Underbody Standardisation: Modular design in the shared MSB platform enables greater investment – lighter weight, higher strength and better performance

Platform Designing: The same 2018 underbody components in modified layout underpin both the Porsche Panamera (above) and Bentley Continental Flying Spur (bottom)

Design Freedom: Car design is driven by beauty and emotion; why shouldn't this apply to housing?

Modern cars are dependent on good design to an extraordinary degree. For aesthetics, but also for everything you touch and feel. From water management (leak prevention), to door close quality and sound. From whether a driver's hand gets greasy at the petrol pump, to whether a switch is intuitively in the right position – and delivers the right feel when pressed. All of this is enabled by investment in the right tooling, and through using a modular engineering approach.

The housing challenge

We take it for granted that new cars will be well designed, that they will arrive on time and that when they do, they will not leak. Is the same true of the home buying experience?

There could be massive potential benefits if housing developers were to embrace the platform design approach. But they would need architects, designers, developers and engineers to work together to consider cost models, life-long user requirements, and longer-term trends.

For our neighbourhoods of the future, the platform approach offers new opportunities for customisation. Designers should lead the way and focus on standardising where there is a high investment cost, geometric similarity or cross-system integration. Potential areas for interventions are not just sub-assemblies such as walls, floors or structural elements, but also wiring layouts, network infrastructure and customer interfaces.

At Forge Design we consider this a huge opportunity and have been working closely with Soho+Co (www.sohoandco.com), a forward-thinking, London-based architecture and design firm. Their research practice considers the impact of modern technologies on design and construction, and they frequently apply their significant expertise in off-site fabrication techniques to award-winning buildings.

In considering opportunities for modular housing, Soho+Co see opportunities in breaking down the traditional trade barriers in housing construction.

Historically, housing is built around sequences of trades, where specialist materials and skilled labour are layered in space and time. Repetition is used to reduce complexity and

thinking time, where different skills and tradesmen need to co-ordinate and work together. But the separation of trades builds redundancy and unit cost into the system, and takes quality out.

Each building operation seeks to limit liability by concentrating on one area of expertise (such as electrical fit-out or dry-lining) and installing materials or items in a way that minimises dependency on other trades. This drives the development of linings, systems and materials that minimise the need for collaboration. For instance, a lining of two sheets of plasterboard might guarantee a specific fire or acoustic rating – avoiding the need for individual testing, or contextual thinking. A platform approach could deliver these properties at a higher system level,

potentially making a room more spacious, with more light or easier access.

Pre-assembly in a controlled, factory environment can de-risk critical operations, such as measuring and setting-out. It enables tooling for key components that span different traditional trades and regulations, with associated benefits for cost, and design freedom.

Enabling wireless connections or being able to standardise and reduce the cost of implementing sprinkler systems, would liberate the house plan from more constrictive fire and layout regulations. This would make rooms bigger, with more light, and options for usability.

Fixturing can liberate the design process from being overly systematic, allowing more variety in the outcome, with different positions for openings and service routes in every room. The pre-fabrication opportunity is maximised when the construction process is considered holistically.

Where the right balance is struck, a platform-based design approach can provide an improved user experience. This can be achieved through standardised ergonomics, operating conditions, touchpoints and

materials. Consider, for example, the ease and familiarity of a driver moving between several different Ford vehicles. Design time, and cost, can be allocated to a reduced number of different switches, electronic systems and components; making them considerably better and easier to use.
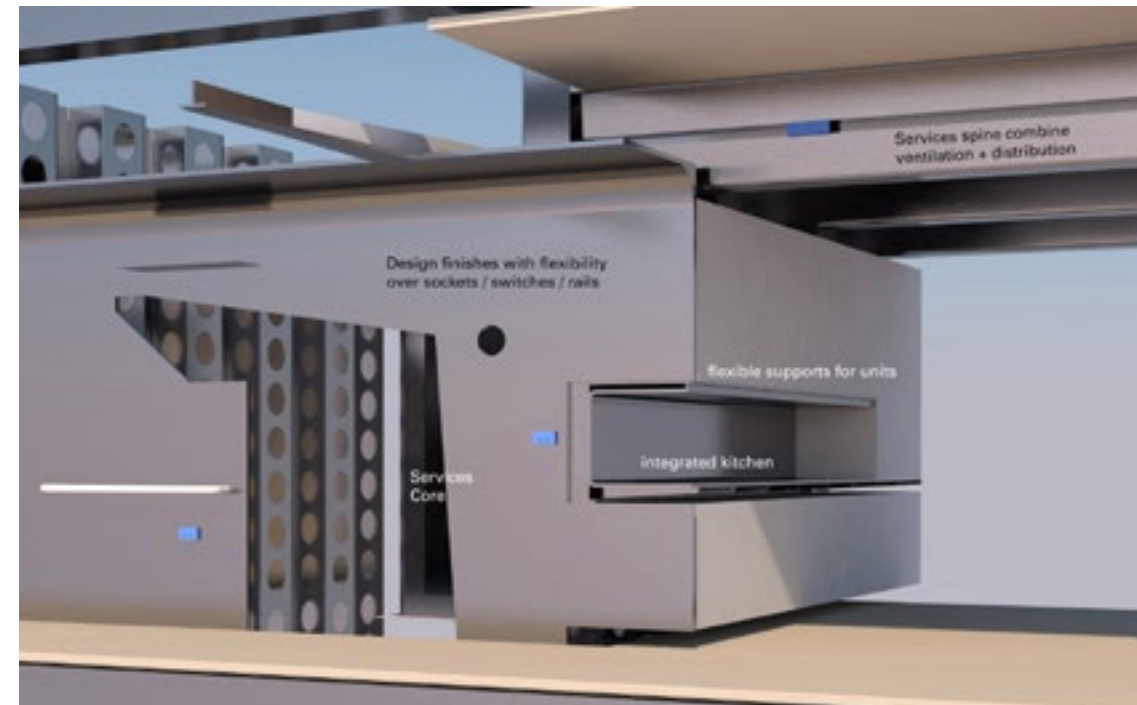
Interesting parallels can be drawn between housing and automotive design. Fundamentally, both involve structural and legislative constraints which impose costs on the designer or manufacturer. These are areas with repetitive issues, where it is worth spending money to standardise.

But both industries also involve areas of high-customisation. In housing, this is particularly the case for ageing populations whose needs become more specific as they get older.

Using a platform-type approach and unleashing the power of good design, must surely be the best answer to these shared challenges.

1   Carsalesbase.com, European sales figures 2008-10, available at www.carsalesbase.com

Photo credit: Images courtesy of Forge Design

Space: Building in sprinkler systems, and designing structures to perform multiple functions, liberates space for more flexible layouts – and more space and light

Housing Platform: Tooling for and modularising the most important structures of a home could give designers unprecedented freedoms
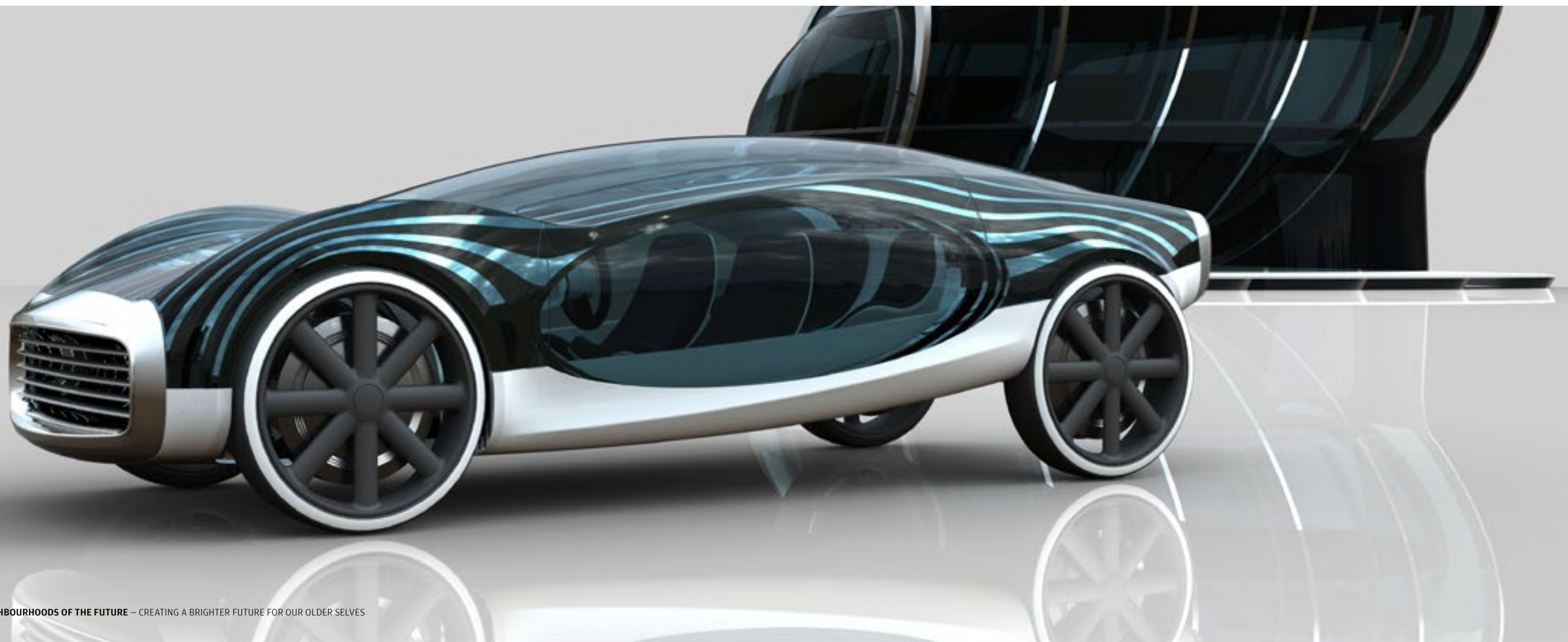
The future is social – Rethinking ageing in place

Dr Tarsha Finney
Programme Lead, City Design, Royal College of Art

The title of this investigation, Neighbourhoods of the Future, reflects the real challenge of housing and ageing: how to address our social selves.

Typically, we are thinking that solutions to ageing can be found by skinning the interior surfaces of our existing homes with new technology: smart walls, smart floors, machines that speak to us, that help us to retain mobility, that aid our getting in and out, on and off things. This is the current state of play with the broadly deployed strategy of 'Ageing in Place'. We want to keep ourselves in our homes for as long as possible, we want to stay out of institutional care, we want to be surrounded by familiar streets and rooms, by family and friends. But it's not working.

What we haven't noticed in the move from ageing in an institution, to receiving care in our homes, is that our social selves have been forgotten; the critical need we have for a finely calibrated daily life together – one that exceeds the false intimacy of the TV, of 15-minute care visits, or a robotic future of automated care. What we're ending up with is a profound and existential crisis of isolation and loneliness.

The future of ageing is a spatial challenge, it is not a technological one. The answer is a matter of design, of addressing how we organise ourselves together, spatially, and how we spatialize our deep social need for intimacy, care and connection. And it is about creating innovations in our understanding of how the city could work at multiple scales with that ambition: the scale of the individual dwelling unit, its relationship to the building block, the neighbourhood and the urban district.

Neighbourhoods of care

First and foremost, our neighbourhoods need to be dense, walkable, and intergenerational, with an intense focus on social and shared spaces to counter the isolating effect of our inherited 19th and 20th century housing, particularly in terms of both ageing and new technology.

As the global leader in post-graduate art and design education, the Royal College of Art is driven by theory and conceptual thinking. But in order to be truly transformative we equally understand that we need to build prototypes that radically challenge the status quo, that allow people to experience different ways of living together of understanding and imagining themselves together, and so that they can ask more informed questions of urban change and expect more of the

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changes happening around them. We need to perform post-occupancy evaluations on these projects and broadcast those findings widely. Others need to learn from this work, to be able to do better in changing their own environments, and to ask more from developments occurring in their local contexts. The value of the Neighbourhoods of the Future project is that it will empower people beyond itself to do more in their own cities and neighbourhoods.

Proximity doesn't equate to intimacy

But we need to do more than this. Proximity alone is not enough. Any work looking at the Neighbourhood of the Future needs to ask a new set of questions with a view to understanding where we find intimacy and care if the family is no longer the primary site of that function. Therefore, the logic of the single-family dwelling, or the single apartment, no longer holds — but we don't yet know what other forms of intergenerational, non-familial housing there might be.

Globally there are some clues: new housing projects in Germany, Switzerland, Australia, Austria and Spain challenge the typical forms of ownership and governance that we find in housing in the UK (for example co-operative, built to rent by institutions, shared ownership.) This, in turn, is leading to new design outcomes for shared amenities within a building block, and therefore what kind of shared amenity and democratic participation residents have in their place,

and in place-making — where place making isn't about material selection and short-term pop-ups, but about fundamental questions of governance, participation and consensus building, in the creation of resilient nimble communities of interest. This is key to meaningful intergenerational engagement. Globally, aspects of this are emerging, but nowhere has it been incorporated as a totality into an integrated project, nor has it been done within the specifics of the UK regulatory and legal context. This is why this Neighbourhoods of the Future project is so exciting and so essential.

Co-designing society

Fundamental to this process of investigation and experimentation must be the bringing together of very complex stakeholders into the design process — led or guided by specialists in spatial practice — architects and designers, but also involving artists, academics, healthcare professionals, planners and local councils, construction specialists, manufacturing, the not-for-profit sector and of course future residents — eccentric groups prepared to negotiate their differences in the interest of shared future lives together, and in so doing, to challenge the standard models of housing we currently have. This is a process that involves knowledge exchange between disciplines and silos via the design process and as part of rethinking the city at the scale of the neighbourhood: the design process is the ground of exchange, space is the material of action.

This is what we do in the RCA School of Architecture, and within the MA City Design at the Royal College of Art — and through the substantial research work specific to ageing and health emerging through the Helen Hamlyn Centre for Design. Here, we work with organisations as diverse as developer British Land, Southwark Council, the NHS England Horizons team coupled with sophisticated international transport operators such as the MTR in Hong Kong, and large tech players like Google.

In summary, the RCA is fully committed to this important collaborative initiative. The ambition is to draw a broader public into a conversation about other possible futures, creating actively engaged citizens, not passive consumers of mass produced-housing, where we are all involved in the project of questioning what is possible together, what we can share, who we can be together.

The future has not yet been written. Collectively we can make a difference.

Photo credit: Images courtesy of Tarsha Finney and The Royal College of Art MA Architecture programme — Daniel Yoell

GoGlobal: East meets west to rethink ageing societies

Benton Ching
MA/MSc candidate in the IDE programme
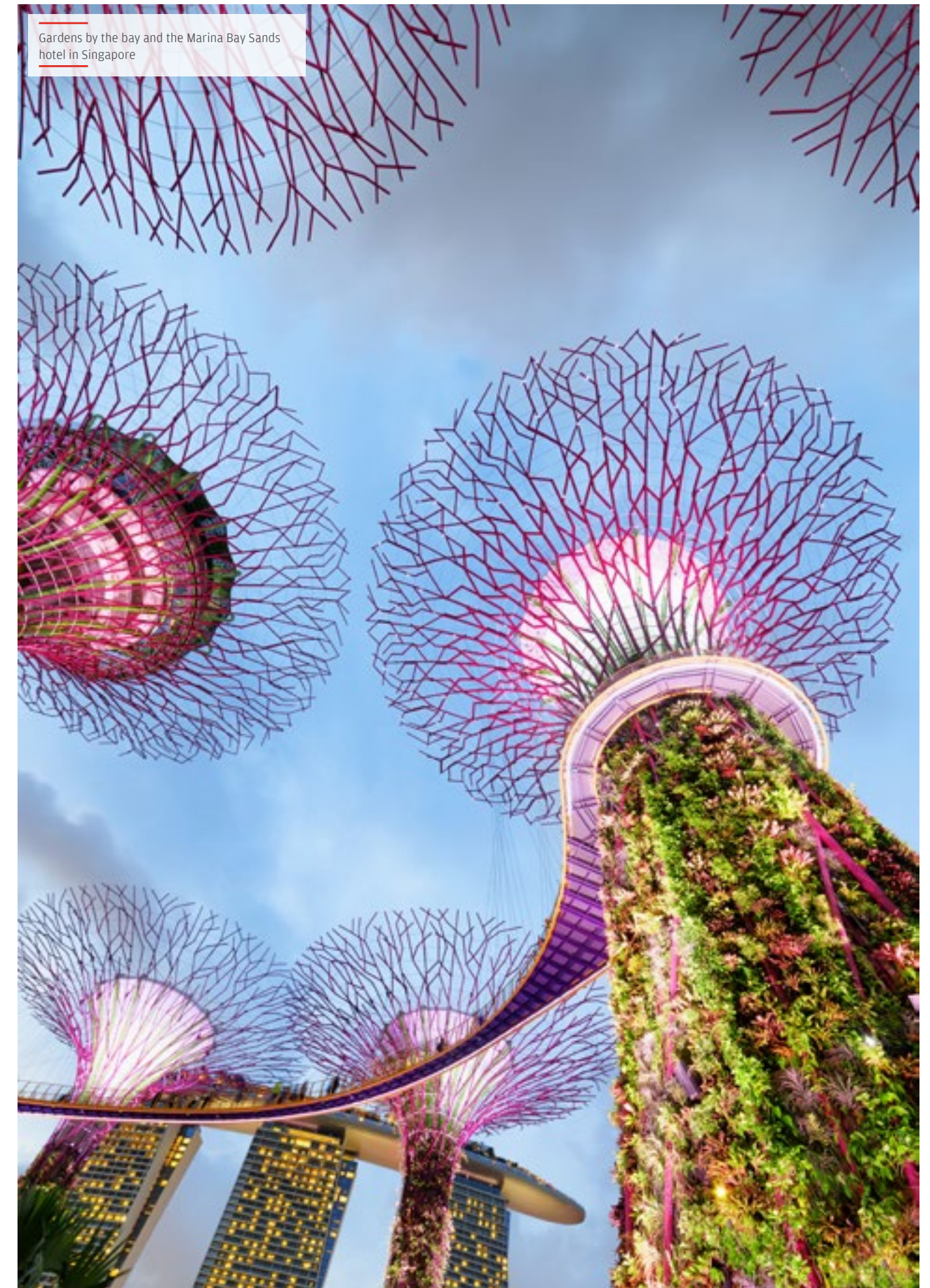**at the Royal College of Art and Imperial College**

Every year, Masters students from Innovation Design Engineering (IDE), a joint Masters program between the Royal College of Art and Imperial College, take part in GoGlobal, an overseas project held alongside international partner institutions. GoGlobal provides a unique opportunity for students to hone their skills as designers, whilst building meaningful connections and global perspective through working in teams with students and experts in a new cultural context.

Innovation for an ageing population: Design for our future selves

The 48 members of the IDE cohort of 2018 are, like those who have come before, a creative mix. A seemingly disparate group of artists, designers, engineers, physicists and philosophers from around the world, tied together by the common aim of using the principles of design and engineering to making a positive impact in the world.

For GoGlobal 2018, which took place in March, we travelled to Singapore, to collaborate with students from Lasalle College of the Arts and Nanyang Technological University. The overarching theme for this year was Design for Our Future Selves. This was partly inspired by the Design Museum's 2017 New Old exhibition, which featured works looking to harness design to improve living conditions for an ageing society. We were tasked with formulating our own briefs over a three-week period, through a combination of desktop and primary research into the difficulties and aspirations of older people living in Singapore. Teams were asked to look at how design might better prepare society for living with an ageing population in the following four areas:

- Transport and Mobility
- Housing and Communities
- Leisure and Learning
- Health and Wellbeing

Gardens by the bay and the Marina Bay Sands hotel in Singapore

off-peak hours

peak hours

Shyft, a vision for a reconfigurable urban landscape that responds to commuters' needs at different times of the day

Exploring fresh ideas and cultural contexts

The issues of an ageing population are highly relevant in Singapore. Although this was something we were briefed on, and had researched prior to our arrival, it was vastly different experiencing the city's deeply ingrained approach to age-friendly innovation first-hand. It should not have been surprising that the country is receptive to, and actively looking for, new ideas to improve later life conditions for its citizens. It is expected that 1 in 4 Singaporeans will be aged 65 and over by 2030; changes wrought by a post-war baby boom, increased life expectancy, and low fertility rate.

Through organised lectures and talks involving leading local architects, designers, researchers and policy makers, we learnt very quickly that tackling the challenges an ageing population brings was something that extended across both private and public sectors in Singapore.

In addition to these talks, we also went on a series of insight trips, to learn more about the local context of the four thematic areas. This included visits to culturally important neighbourhoods at the crossroads of heritage preservation and urban development, multigenerational learning facilities, hospitals and research labs conducting cutting edge research at the forefront of medical technology, and test driving futuristic autonomous vehicle prototypes.

It became apparent that the real challenge was to create innovative ideas for improving life in an ageing society in an environment already accustomed to and bubbling with new ideas. Working in mixed teams of 8 with our local counterparts, we tested our ideas with Singaporeans on the street, both young and old. We found people incredibly open and willing to engage with our thinking, which provided a fantastic platform to test, experiment and prototype.

Although GoGlobal encouraged us to design solutions highly pertinent to the Singaporean context, we were also encouraged to find generalisable insights for our own local contexts, both in the UK and beyond. We brought back our findings from the trip and four projects were selected to be presented at the AAA Neighbourhoods of the Future Congress at NatWest HQ in London earlier this year. The projects presented were:

Cityscope, a design intervention to activate and incentivise the use of the growing number of vertical green spaces around Singapore, using multisensorial periscopes.

The project focused on the city's plans to reconcile urban development and the proliferation of green spaces through the Landscaping for Urban Spaces and High-Rises (LUSH) urban redevelopment programme. This policy mandates that greenery lost in development is replaced with rooftop green spaces. However, these green spaces are not actively used. By using the periscope as a means of drawing both a conceptual and visual link between ground level and elevated green spaces, Cityscope offers a playful counter to social and psychological barriers which may impede people from using these vertically segregated spaces.

For Andrew Earl, who worked on Cityscope, such interventions are useful for Singapore and beyond: "Singapore innovates on a city-wide scale and we believe that its progressive legislation around elevating urban green spaces will set an example for other major cities."

Shyft, a vision for a reconfigurable urban landscape that responds to commuters' needs at different times of the day. Its features include the use of an intelligent lamppost and bollard system that informs pedestrians about changes in road conditions over the course of the day, using lights and opening up of shades.

The project capitalizes on Singapore's active investment in creating an efficient transportation system for the future, and its plans to introduce autonomous and connected vehicles to the road by 2023. These investments enable two future possibilities: a car-lite city, and a real-time digital map that can be used to re-direct traffic. Land is limited in Singapore and currently the country aims to combat this problem by stacking the city. However, a car-lite city and real-time digital map allows for an alternative method of transport infrastructure by reclaiming road space.

According to the RCA's Insiya Jafferjee and Timi Oyedeji: "One of the key problems for a small country like Singapore is a lack of space. We designed Shyft as a way of using information systems to balance autonomous transport infrastructure with the need for Singaporeans to have accessible public space."

Dolesce, an innovative mediation tool that aims to overcome communication barriers and facilitate conversations between dementia patients and their loved ones. Looking closely at the relationship between the caregiver and the patient, one of the major sources of distress in the lives of both parties is the behavioural and personality changes that occur as a result of the disease. This makes it difficult for the caregiver to maintain meaningful conversations with their loved one and results in feelings of depression and isolation for both.

Dolesce makes use of the fact that we live in a time when almost all of us have an extensive digital footprint and there is already a vast amount of data being collected on each individual. This data can be collated to create a virtual framework of the patient's life, so that the stories of their past need not be lost. The objective of the platform is twofold: to provide prompts and triggers to the patient that encourage sharing and reminiscence, and to provide contextual information to the caregiver, to enable them to engage in meaningful conversation with their loved ones.

According to Dolesce designer Ravi Woods, "After doing primary research with nurses and at care homes, we found that, as the

It is perhaps these attitudinal shifts which are required to disrupt the existing status quo.

GoGlobal, an overseas project held alongside international partner institutions

personality of a dementia patient drastically changes, family caregivers find it difficult to care for them. Dolesce allows family caregivers to be reminded of how the patient once was, giving context during conversations with the patient."

Memo, is a concept for a future space and system of remembrance in Singapore, where people can reminisce, reflect, and learn from their loved ones and others. Conditions of remembrance in Singapore, and throughout the world, are transforming. Limited land space is causing burial grounds to diminish and increase in price, while death still remains an uncomfortable topic for many.

Memo is designed to exist between the retained buildings from the historical sight of Dakota Crescent – a place where a flowering, unique culture with a strong sense of community once existed. The space is designed in a natural, open area that gives a sense of reflection and encourages connection with others. Between the different levels of the open space, individuals are able to find memory flowers of the deceased, artefacts on which digital memories and other assets are stored. Families and visitors can interact with the flowers by picking them up and viewing the memories in specified areas.

Memo looks to take the transformation of remembrance in a new direction, giving a stronger sense of family and individual contribution to society. Designer States Lee, who worked on Memo, mentions the need to preserve local culture as the key take home from the project. "Through research, and the context of Singapore, Memo taught us that remembrance of the deceased and the past can be improved, as rapid modernisation dilutes cultures, removes physical burial spaces, and keeps us increasingly busy. Creating Memo caused us to think about the importance of physicality of remembrance in our lives and how technology can improve the experience instead of removing us further."

A key insight when looking holistically at this exciting RCA project in the context of our Neighbourhoods of the Future, was the openness to new ideas and innovation that trickled down from the reaches of policy, to entrepreneurs and designers, and even to the Singaporean public. There was also the country's strong focus on multigenerational interaction and framing the issue of an ageing population as one that affects not only the advanced in age, but one that is deeply ingrained in the lives of people across the various social strata.

Perhaps most importantly, is to consider the importance of the nuances of human behaviour, not just in the mainstream, but also those on the fringes of accepted convention that might provide insight into how our local environments are changing. It is perhaps these attitudinal shifts which are required to disrupt the existing status quo, resulting in the creation of cities and neighbourhoods which move beyond accommodating its older residents as a footnote, to ones which are truly inclusive and in which they can feel deeply enmeshed and part of its future development.

I will leave the final words to two of my fellow students:

"This process makes you develop adaptation skills to different ways of living, different ways of thinking, different ways of designing. Human-centred design is about understanding the needs of people, and I think regardless of the success or potential of the ideas that emerged from this project, it was a great opportunity to actually engage with the people we were designing for."

Pierre Azalbert

"Singapore runs 10 years ahead of any (other) country. To see how our designs work in the Singaporean environment is like designing for our future selves."

Joris Olde-Rikkert

Photo credit: Images courtesy of Benton Ching

Let's design for ability

Marta Fernandez
Director, RMIT Europe

All people should feel safe and confident to step out of their homes and participate in society. Well-functioning and accessible neighbourhoods have a positive impact on people's health and quality of life, and older adults in particular require a supportive and enabling built environment.

The success of housing is intimately linked to the environment and the accessibility of nearby streets, sidewalks, parks, squares, shops and so on. Looking to our homes and neighbourhoods of the future, we must start planning now how to integrate age-friendly environments in and outside of our cognitive homes.

The MacArthur Foundation describes successful ageing as "the ability to maintain three key behaviours or characteristics: low risk of disease and disease-related disability; high mental and physical function; and active engagement with life." It was in London that I learned that the space beyond the home, i.e. the neighbourhood and its community, is key for successful ageing.

My story

I started volunteering with older adults when I was fourteen. I cleaned floors, washed bedding, fed and conversed with mentally disabled older adults in a care home in the hills of Granada. This, alongside looking after various great aunts and grandparents,

developed my passion for older people's wellbeing. Little did I know the influence it would have on my professional life to come.

The care home in Granada had big, airy rooms that were full of light. The wide corridors and ample surrounding landscape made it a very pleasant space. The attentive care of a handful of nuns, working with young people like me, made it a warm place to work and live. There, I realized how important a part the environment can play in supporting or undermining the quality of care a person receives. Though every situation is unique, a successful outcome is very much dependent on the human factor.

Many years later, when I was living in London, I joined a befriending scheme where I regularly visited an older lady living by herself in West London. Whilst she was willing and able to look after herself (and you would not dare to suggest otherwise!) she was lacking companionship. My new friend was very happy to live in her own home where she had long-term attachments, even though her home was a duplex and she had mobility issues that made her dependent on a chair lift. She was not, however, confident outdoors, so the visiting community services were very important. Transportation to access the shops, the doctor and the church every Sunday were fundamental for her wellbeing.

A design workshop held with older adults

Urban developers need to provide solutions that are cost-effective and consider universal design. Universal design (i.e. design that is accessible to all) which is applied to public spaces, transport, buildings, as well as products, has been shown to enable people to maintain independent lifestyles and increase social inclusion.

In our studies, we identified simple interventions that can make a tremendous difference to how confident people feel outdoors. These may include lighting solutions for pathways, decrease of acoustic contamination, solutions to improve navigation in the city, approaches that improve safety and comfort, signposting and access to attractive infrastructure, transport networks, green spaces, amenities and easy walking routes.

Options such as easy walking routes and efficient public transport systems will add to a person's sense of safety, independence and quality of life. Easy to access green spaces, amenities and attractive infrastructure enable social interaction. This is particularly important for older adults, who already face a heightened risk of neglect. Though the value of these personal interactions is not easily measured against material or technological approaches, they must form the foundation of effective solutions.

Designing technology for independence

The current older generation demands greater independence and improved self-actualisation, and an end to patronisation. I can clearly see this in my ageing parents. Many governments around Europe, as well as the European Commission, are investing heavily in new technologies to support independent living. Technology has tremendous potential to help realise these desires, but only if sufficient attention is paid to its implementation and integration into individual lives.

Technology should not be used to define new behaviours. Technology must respond sensitively to existing needs and must seamlessly support the human side of care and services. There is a need to embed care and an understanding of users into all digital innovation. Insensitive, incorrectly applied solutions without the right user interface risk undermining independence and increasing social isolation.

The success of housing is intimately linked to the environment and the accessibility of nearby streets, sidewalks, parks, squares, shops and so on.

We do not want our children locked in their room playing videogames, so why we would want to lock our parents and grandparents away in their technologically equipped homes?

Community support is key for active and healthy ageing. Technology can play its part in mobilising and engaging the local community in the challenge of care; to help exchange skills and knowledge and support formal and informal care networks.

Looking to our homes and neighbourhoods of the future. To design meaningfully for older adults, we need to consider the great variety of needs and desires among different age groups. If we design for our older selves, we are designing for everyone; we must design spaces that are inclusive. If we find the formula for cross-generational design that stimulates interaction across the ages, we will drive cohesion and integration. From the individual, to the city scale, design must consider current and future needs, to allow for flexibility and adaptation to change. This means designing for ability to enable independence, which includes activities and access in and outside the home.

Photo credit: Images courtesy of RMIT Europe

Proven methods for urban design

From a professional perspective, the needs of older people, and individuals living with disabilities, haven't been properly considered by urban designers and local authorities. Inaccessible and poor-quality urban spaces, as well as unsuitable architectural design features within buildings and facilities, impede many in fully participating in society.

In London, I had the good fortune of working for Arup as Global Research Leader. Arup is a forward-thinking design and engineering consulting firm. The company has an innovative approach to city development and improvement, from resilience, to lighting and mobility. Back then, I had an opportunity to work with the Cities unit and set up a research line into Ageing in Cities, looking into the relevant socio-economic trends, the implications for the built environment and the potential interventions to enhance wellbeing for our ageing population.

In the past, planners tended to focus on topics such as economic growth, sprawl, and allocation of scarce resources within a community. We noted that with the rise in the number of older citizens, consideration about how the community can have a positive influence on individual wellbeing was missing from the Smart City agenda. This means asking how the physical and social environments can promote independence and encourage engagement, thereby facilitating the development of 'livable communities'.

Through our research at Arup, we identified multiple examples of successful interventions across Europe, which demonstrated approaches that promote more inclusive and livable urban design. Good urban design promotes independence, provides a sense of safety, improves quality of life and enables people to participate more actively in society.

PriestmanGoode Scooter for Life

Designing mobility for life

Paul Priestman
Chairman, PriestmanGoode

The idea of designing for ageing demographics is a curious one. We all age. Hence designing for older people is designing for everyone. Design and mobility are integral to our everyday experiences. Everything around us, from the smallest items, like light switches and mobile phones, to buses, trains and airplanes, is designed. But design can often be exclusive, catering for the able-bodied, with considerably lower consideration for those who have accessibility issues or impairments, or conditions like dementia.

I believe we need to shift our mindsets. It's time to move away from a reactionary attitude to existing problems, to a preventative outlook. That means we are designing with the aim of encouraging and facilitating a healthy and independent life for as long as possible.

The New Old exhibition at the Design Museum in London in 2017 showed that the average life expectancy of those born today is 105 years old. Our lives are getting longer. Our healthy lives are not. This means there are a whole new set of challenges that we will have to tackle, not just as individuals, but as a society. This is where good design can make a real difference.

Designers have an important part to play in affecting behaviour. Design thinking and considered resolution allow us to offer products and solutions that help people stay fit for longer. They provide older demographics with independence as their physicality may be slowing down.

Mobility is at the heart of extending our healthy lives, and there are various ways that we can rethink transport to improve individual experiences.

Walk the line

One integrated potentially disruptive solution for cities to improve pedestrian infrastructure is called 'Walk Lines'. The concept, which the PriestmanGoode studio developed, would provide dedicated walkways that create a speedier route for people wanting to get from A to B quickly. You could incentivise it by making it part of a public transport system (in London, for instance, it would be part of the bus, tube and overground network), and offer money back to passengers who choose walking instead of buses or tubes over short distances. This would have the added benefit of relieving pressure on other modes of public transport that are struggling to cope with increasing numbers of passengers.

Walk Lines has many benefits. On the one hand, it keeps people mobile. It also makes walking a more pleasurable individual experience: there would be no need to stop at junctions or wait for traffic lights. The lanes would become like highways for pedestrians, with dedicated slow and fast walking lines. Dedicated infrastructure such as 'walk stops' would be placed at regular intervals along the way. These would encompass a series of services, such as maps, coffee carts, shoe repairs etc.

Walk Lines would also improve air quality in city centres and improve quality of life for urban dwellers. You could also design these walkways as a zero energy infrastructure, by designing covered walkways with solar

Walk Lines keeps people mobile. It also makes walking a more pleasurable individual experience.

panelled roofs that would then power street lighting. Incorporating these elements would have both environmental and economic impact, by lowering energy and maintenance bills for councils. The health benefits for inhabitants would also decrease the pressure on national health services.

Design can be patronising

The idea of using design to improve healthy life is absolutely key both on an individual basis to extend healthy life, as well as to ease pressure on our infrastructure and from an environmental viewpoint. Aside from walking, we also need to consider other ways to improve travel over short distances, and tackle what is known as 'the last mile', the distance between where public transport stops (e.g. a train station) and the destination (e.g. home or work).

I think a lot of design for older generations can be quite patronising. Products are designed with a certain look. Assumptions are made about the lifestyle that older people have, and the type of design that speaks to them. I believe it's all wrong, and we need to rethink design for ageing demographics.

The Design Museum enabled me to do just that. For their exhibition 'NEW OLD – Designing for our Future Selves' I developed a concept for a push scooter that was designed to transform both people's experiences of mobility in older age, as well as challenge public perception of what a mobility product for an older demographic should look like.

The idea for the Scooter came to me from observing people during the morning and evening rush hour. I would always see children on scooters on their way to school, and increasingly, I would see adults using scooters as part of their commute. It led me to think about why people stop using them. Is it a fear of falling? Is it because scooters aren't deemed stable enough for older people? Or is it simply that as they haven't been part of the person's life, late adoption is low to non-existent?

As I started working on this concept with my team, we held a number of research sessions with user groups. In one of these, where we were looking at different ways of getting around, one user looked at a traditional motorised mobility scooter and exclaimed 'you can smell the stench of decay on that!'

Scooter for life

There is undoubtedly a stigma associated with mobility aids – and ageing more generally – and we were determined that our solution would address this. Many of the users we spoke to felt that current solutions felt like having 'one foot in the grave.' So we wanted to design something that was both beautiful as well as highly practical. We discussed what requirements people had for a mobility aid and came up with a list of boxes that our solution would need to tick: you had to be able to take it on a bus, to take it into a shop, it needed to be able to fold down, there needed to be space to store groceries, and it had to be able to be taken into a flat or a house.

Based on these key considerations, we developed the Scooter for Life, a product for all ages that is highly adaptable and helps older demographics improve their mobility on a very practical basis.

The Scooter for Life has received enormous interest from consumers all over the world. We are regularly contacted by older people who say they finally feel that here is a product that will make their day to day life easier, and crucially, represents who they are as individuals.
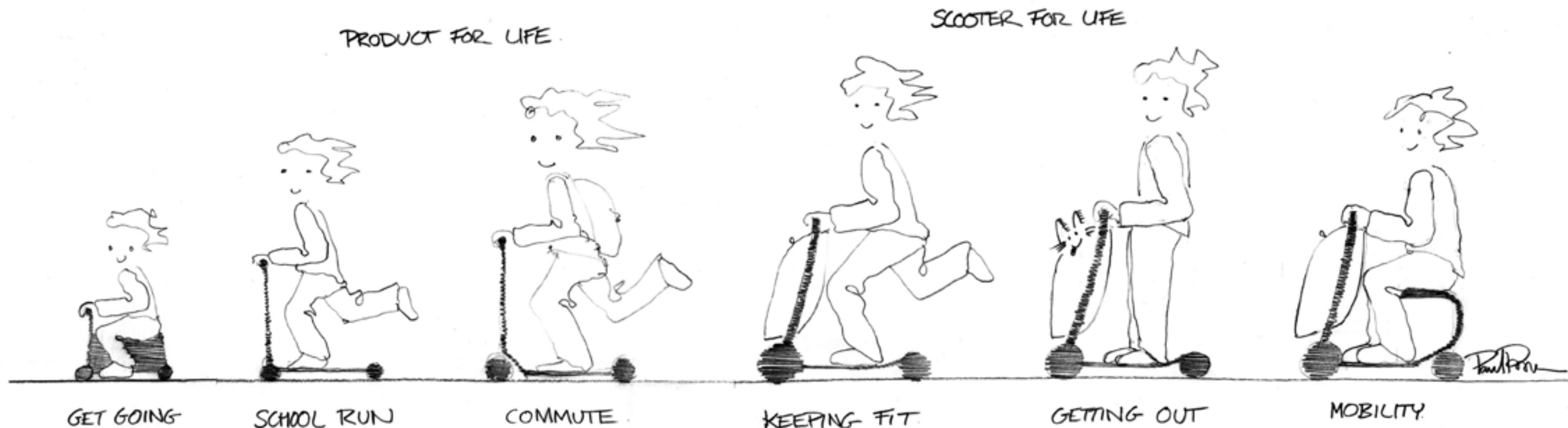
PRODUCT FOR LIFE.   SCOOTER FOR LIFE

GET GOING   SCHOOL RUN   COMMUTE   KEEPING FIT   GETTING OUT   MOBILITY

One integrated potentially disruptive solution for cities to
improve pedestrian infrastructure is called 'Walk Lines'

Priestmangoode Air Access, for mobility when flying

The sharing economy model

The benefit of the Scooter for Life is evident in urban areas, where it facilitates shorter journeys, but it's also critical that we develop these solutions for rural areas that are less well served by public transport. There is a great irony in the fact that many people move to the countryside as they get older, where infrastructure is poorer, when that is the time they need it the most. There have been countless discussions in local governments and in the media in recent years about the lack of public transport services in rural areas, and the negative effects that this has on communities as well as on individual experiences. We need to reconsider the way services are distributed.

> We decided to invest time reimagining the way things are normally done.

Using the sharing economy model for rural transport services would have the additional benefit of strengthening communities. I think we will see these new types of public transport services as social hubs, that have the benefit of improving individual day-to-day experience and create a sense of belonging to a greater community.

The sharing economy provides an interesting model, as it makes better use of resources and existing infrastructure, both on an individual level, as well as from a sustainable one. This is imperative if we want to truly affect change.

Air access

One of the most challenging experiences for passengers with reduced mobility is flying. PriestmanGoode has significant expertise working on aircraft design so we decided to invest time reimagining the way things are normally done and developed a concept that facilitates air travel by enabling an easier transition from gate to aircraft. Named Air Access, the design meets the needs of an increasingly older and less mobile population. It consists of two elements: a detachable wheelchair by which passengers can be transported onto and off of the plane, and a fixed-frame aisle seat on the aircraft into which the wheelchair is mated to create a regular airline seat. By enabling people to get into their seat at the gate, Air Access reduces the indignity, discrimination and anxiety that many people with reduced mobility face when travelling by air. But what makes this a viable solution is that it makes the most of existing infrastructure and products. Furthermore, it works within the confines of one of the most heavily certified industries. As designers, we need to strike a balance between the future concepts we develop and the realities of the industries we operate within.

In conclusion as a society we need to have greater consideration for what it means to get older, for the individual experiences that people encounter, and that we will all have to face at some point in our lives. We need to address the stigma attached to getting older. Design can help us improve our everyday experiences in the neighbourhoods of the future, by making better products that are easier and more intuitive to use.

More than anything, we need to revisit the very notion of 'old age' and create new products and services that recognise the accrued experiences of ageing as a benefit, when one has the time to enjoy life, and enable us to promote and prolong healthy lives.

Photo credit: Images courtesy of PriestmanGoode

The case for new vehicle typologies

Jose Paris
European Program Director, aiPod

Mobility will be a crucial driver in the creation of more liveable, accessible, and attractive towns and neighbourhoods in the 21st Century.

Profound changes to the industry have been gaining pace, and despite everything (streets, vehicles etc.) still "looking the same", it won't be long before we can experience a very different way of getting around. Even the leading actor of 20th Century mobility, the car, will not be spared.

Kings of the road

From a cultural point of view, pride of ownership and personal freedom still loom large in the decision to buy and use a car. As the second biggest purchase after the home, people are understandably practical and conservative when deciding what to drive, as one vehicle must do it all.

This customer pull for do-it-all vehicles, combined with the technical requirements for mass production and high levels of crash safety, results in cars designed and built for the extremes: high speed, long distance, five-seat occupancy and engineered to survive a severe crash.

The reality, of course, is that the average speed inside cities can drop below 10mph[1], a large amount of driving is single occupancy commuting[2], and pedestrians and cyclists are the ones at risk, not car occupants[3].

Because of the inertia and legacy costs (both real and figurative) carried by the automotive industry, even when mobility disruptors like Uber start operating, the benefits to the host communities are unclear. In a city like London, the result is up to 40,000 extra five-seat vehicles driving only the driver around half the time. Hardly an improvement over the current status quo[4].

A new species...

If we fast forward 20 years, however, everything indicates that future mobility, especially in cities, will be built around zero-emission, shared, autonomous fleets. Privately owned, five-seat vehicles will still have a role to play, but the decline (or elimination) of ownership, accidents, and high-speed driving, plus the greater focus on liveability, will create a very different habitat.

> **Benefiting segments of the population currently underserved: the disabled, the old, and the underage.**

New vehicle typologies, tailored to personal or societal needs, can flourish. The vehicle itself will finally evolve from horseless carriage to the intelligent, tailored, humanistic node in a transportation system that modern technology allows.
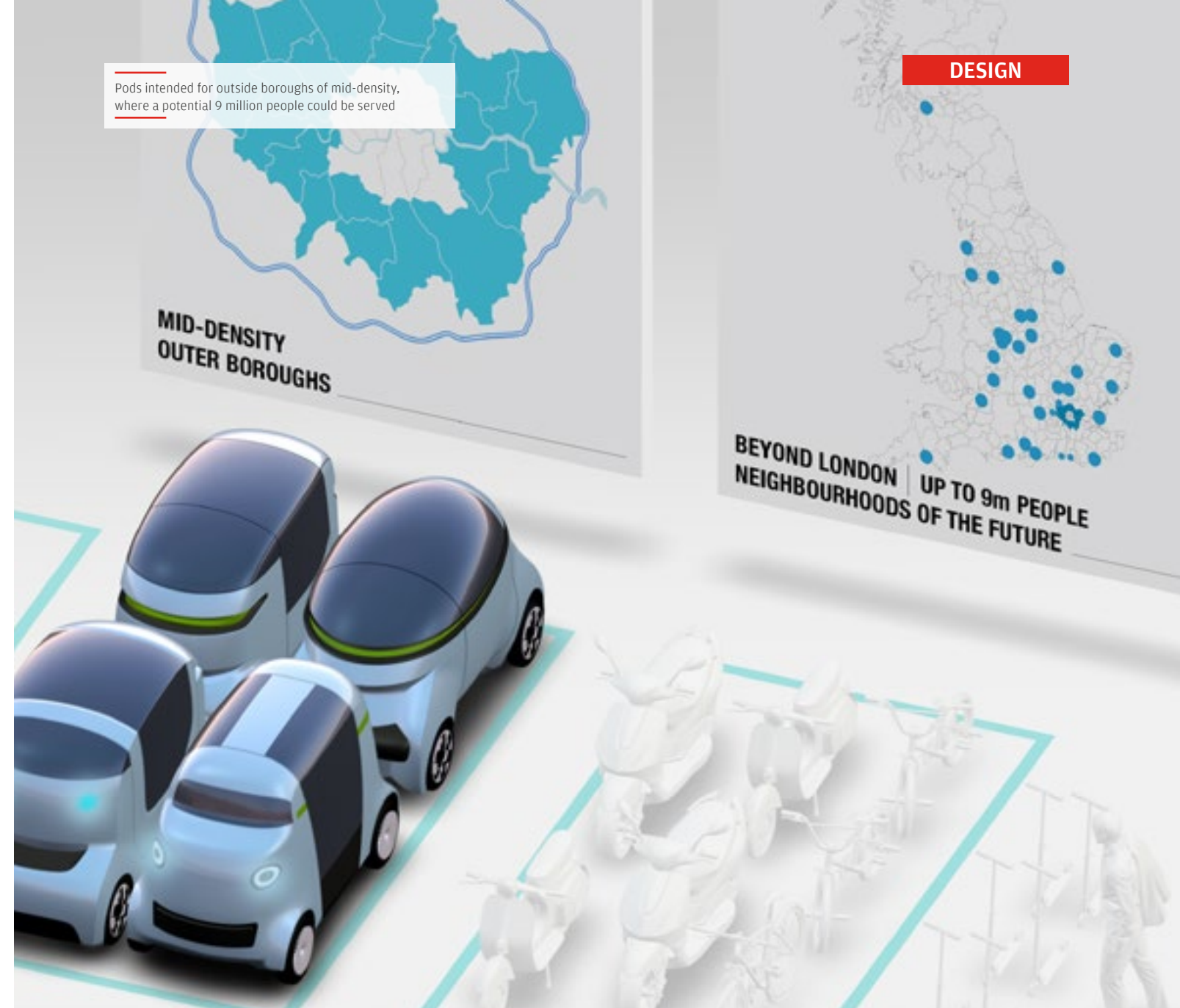
Most urban users can be served by fleets of small footprint, efficient pods, designed with the personal user (not the autobahn[5]) in mind. This new personal public-private transit system will be able to satisfy not only the average driver but segments of the population currently underserved: the disabled, the old, and the underage.

Rather than converted products, personalised solutions can be viable; vehicles that work both functionally (big doors for easy access, integrated ramps, accessible digital technologies) and emotionally (through a better user experience). Higher utilisation rates will mean faster fleet replacements, with the possibility to modify and improve aspects of the vehicle at a more rapid pace.

...For a new habitat

Neighbourhoods will naturally change in response. While traffic will still exist, it will be of a very different kind: silent, clean, responsive to pedestrian needs, and when placed in the context of an intelligent city platform (like the one aiPod is building), fluid and seamless; a gentle stream rather than the noisy stop-go-stop flood we suffer today.

By eliminating the need for street parking, large amounts of curb space will be freed up. This means bigger sidewalks and cycling lanes, or perhaps even space given back to homeowners as new front gardens! In newly built areas, a more compact and efficient planning will be possible, without needing to sacrifice available space or mobility needs for the individual citizen.

Pods intended for outside boroughs of mid-density, where a potential 9 million people could be served

MID-DENSITY OUTER BOROUGHS

BEYOND LONDON | UP TO 9m PEOPLE
NEIGHBOURHOODS OF THE FUTURE

By eliminating the need for street parking, large amounts of curb space will be freed up.

The primary beneficiaries will be the outer rings of cities, as well as small and mid-size towns. Areas where density is high enough to suffer traffic, but not enough to support an extensive public transit network. By solving the last 3-mile problem (as the often mentioned "last mile" should probably be walked!) most short car trips can be eliminated altogether, which will see people reconnecting with more efficient transit, like rail.

Work has already started...

What can we do today? Many private and public sector actors are actively engaged in bringing this vision of the future to fruition. The UK Government (through Innovate UK and the Industrial Strategy Challenge Fund) has been at the global forefront, supporting the combined effort of British businesses and academia, and we hope this visionary approach does not change regardless of the potential turmoil in 2019.

Our project, "Paradigm-Shift", under the Innovate UK-sponsored IDP14 grant program, is aiming to explore some of these new mobility opportunities. Together with UK-based SMEs, Gordon Murray Design and Delta, we at aiPod are helping develop a ground-breaking, single occupant pod designed for autonomous fleets, to be presented at the end of 2019.

...But this is only the beginning

Back in the early days of personal computing, many people thought of the PC as nothing more than a glorified typewriter. Equally today, it is tempting to imagine fleets of driverless cars as nothing more than glorified black cabs. However, if history teaches us anything, it is that hard-to-predict second and third level changes will transform society.

We are only scratching the surface of the innovations ahead, but one thing's for sure: we are in for an exciting ride.

1   CityLab, March 2016. London's Traffic Really Is Moving More Slowly [online]. Available here

2   Department for Transport, July 2018. NTS0905: Car occupancy, England: since 2002 [online]. Available here

3   Department for Transport, September 2017. Reported Road Casualties in Great Britain: 2016 Annual Report, p.7 Chart 2 [online]. Available here

4   The Guardian, 15 Aug 2018. Sadiq Khan wants to restrict number of Uber drivers in London [online]. Available here

5   The term "autobahn", and not "motorway" (speed limited) is consciously chosen.

Photo credit: Image courtesy of aiPod

First do no harm: the hippocratic oath as an inspiration for compassionate architecture

Dr Evangelia Chrysikou
Lecturer, Programme Director MSc Healthcare Facilities
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The ageing of the population highlighted the need for inclusive and enabling societies. This created a market for new sectors of the economy to target products and services towards increasing personal autonomy and inclusivity. However, this article argues that the two alone do not suffice, despite medicine and IT constituting key areas that contribute to significant advancements to people's health and autonomy. As long as the built environment remains our physical context, we do need buildings to be fit for purpose. Contrary, the current building stock limits opportunities for meaningful and autonomous lives, contributing to increased loneliness and isolation in old age, let alone problems of physical health.

Scholars of architecture and architectural theory tend to focus on abstract concepts around the process of design, aesthetics and form. User experience in terms of ordinary built environment is rarely the subject of architectural education. Our houses tend to be less complex in terms of design requirements but are nonetheless significant for our well-being. After all, these are the spaces where we generally spend most of our time. Yet, both the architectural theory regarding housing and the building regulations tend to be uninformed by issues related to the interface between human health and interior design. Moreover, our perception of space, the elements in our environment that we find restorative or tiring, helpful or strenuous, change during our lives. This happens together with changes in our bodies. Currently the gap created by inadequate architectural built environments is covered by technology but this is mostly for implementing mechanisms for early intervention in falls, such as sensors. Adding the built environment into this equation, could prevent some of those falls in the first place.

In what follows I will provide four examples that illustrate this gap between physiology, perception, and the built environment and will illustrate the imperative to change the paradigm that our built environment is designed and created without us being asked or directly involved.
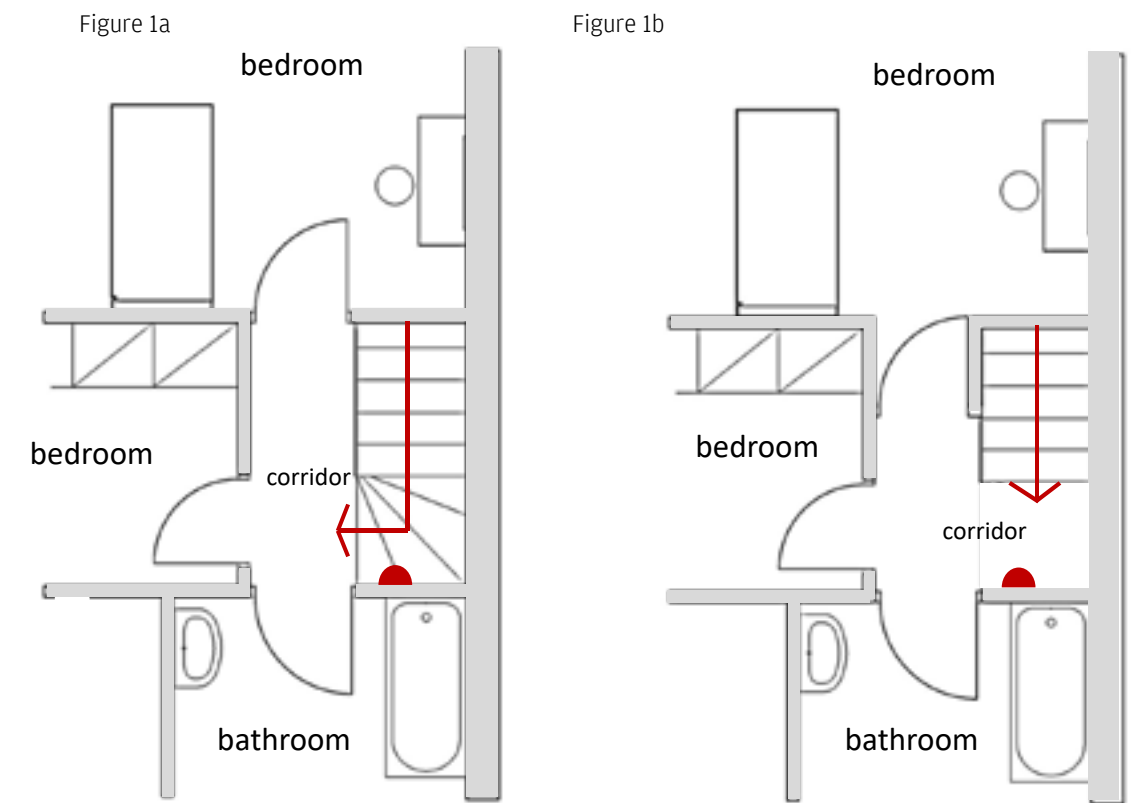
1. The intimate setting

BBC news featured an 87-year-old rescued after being stuck in her bathtub for four days (BBC news, 2016). She "kept calm" and poured hot water to prevent hypothermia. The story could raise questions about the direct or indirect implications of the design with regards to social isolation, the use of technological devices and preventive environments. First, space and its configuration can influence both the frequency and the type of social encounters (Hillier, 1996). Second, in residences, technologies such as cameras could keep an eye on us, especially in areas of perceived high risk. Finally, we should rethink the design of the bathtub itself.

2. The private setting

Building regulations barely mention any measures to mitigate accidents in residential environments. On the contrary, in the area of assisted housing and home environments there is an absence of standards for practice to inform design professionals on the needs of vulnerable people (Zeeman et al., 2016). Figure 1 shows a social housing floorplan where a non-frail 79-year-old died following a fall during a night visit to the toilet when she was half asleep. The example demonstrates that poor design, in combination with other physical or perception factors – in this case reduced alertness – could add to the risk. Figure 1a features the layout and the interior floorplan of a home where a couple lived. The woman got out of bed, walked through the corridor and fell as she tried to reach the bathroom light switch, i.e., the red dot on the wall, located by the toilet door over the staircase. Everything in this house complied with building regulations. However, Figure 1b illustrates an alternative design where the fall could have been prevented by safe, no-barrier zone between the bedroom and the bathroom. The incident was partially the result of design decisions and regulations that were uninformed about the needs of older adults.

Figure 1a

Figure 1b

Figure 1: Current social housing floorplan (1a) and hypothetical redesigned floorplan (1b)

3. The healthcare setting

The third example represents a more specialized healthcare architecture. It highlights a key finding from a project investigating the architecture of the first dementia village in the Netherlands (Chrysikou et al., 2016). The village aims to incorporate in its built environment what was considered state-of-the-art in design for residences for dementia patients, employing technology, landscaping and a protected environment with positive distraction stimuli and art as visual memory aids. Yet, the most private space of the village, the toilet of the common area, where residents go unescorted, lacks any visual or physical aid. Everything follows the same colour scheme, without visual discrimination between vertical and horizontal surfaces or the toilet seat and accessories. Plus, there is a complete absence of any mobility aids for people to support themselves. However, even if there is best practice guidance for the design of healthcare facilities, architects do not always have to comply.

4. The public setting

Finally, I will concentrate on public projects created by "star architects". My example involves a public car park, well known to people interested in architectural avant-garde. A world-leading figure at a star-architect firm used it as an example of architectural excellence during a presentation to post-graduate architectural students. The famous car park featured floor patterns that could be perceived as changes of level by people with dementia or partial visual impairment. Addressing the question about the lack of consideration for neurodiversity, the architect commented that their firm did not design for healthcare but rather buildings such as luxury offices or airports. Yet, airports rely heavily on design means for navigation especially since older people need architectural information for orientation. Occasionally, architectural avant-garde has delivered stations and public areas that were deprived even of seating, ensuring that the design would remain unpolluted by such amenities (De Morgen, 2011).

The need for seamless, integrated environment at the heart of the stakeholder initiatives

The examples outlined concern the whole spectrum of the built environment and constitute anecdotes regarding the state of the built environment as the global population ages. The examples mentioned indicate what AGE Platform Europe advocates: that universal accessibility aids are not a panacea for the psychosocial integration of older people and it is imperative that both perception and physical needs be addressed.

Restaurant in the dementia village

A call for paradigm shift

Currently our built environment is too fragmented and far too partial. If we want the built environment not to be our societal weak link, it is important to determine how to bring on board the people who actually experience these spaces daily and encounter the difficulties of old age from the beginning as decision makers.

Involving end-users in their environments from day one is a clear path to success, as my research on environments for acute mentally ill people shows (Chrysikou, 2014). The project "It takes a Village" (The I'm Still Here Foundation, 2016) demonstrate that even Alzheimer's patients with the right multi-disciplinary approach could reclaim their cities.

It also has to be everywhere and in everyplace. For dementia-friendly supermarkets, for instance, staff training is a common measure and is necessary. Let's consider an age-friendly till with a non-discriminatory, take-your-time sign over it, a wider space for people to pass next to it and a folded seat for the people still waiting in the queue (Lab4 Living, 2015).

For that we need everybody. We must explain to people the benefits of inclusive societies. We need to remember that for the architect to design a 'take-your-time till' we need a supermarket owner to approve it or, even better, request it. Finally, this new paradigm needs to be taught in architectural schools where most students are younger than 25 years old and at that age are generally unable to imagine physical or mental decline in older age. Last but not least, these concepts should be provided in courses of continuous education of all professionals working on the planning and the delivery of built environment.

As a teacher I often use the paradigm of the Hippocratic Oath, a phrase that is cited by all physicians, insisting that it should equally apply to architects: "First do no harm. Then, try to do good". These two lines, in that order, should support a new paradigm that all architects and professionals of the built environment should be aware of and incorporate in their practice.

Scholars of architecture and architectural theory tend to focus on abstract concepts around the process of design, aesthetics and form.

Permits

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Photo credit: Images courtesy of Dr Evangelia Chrysikou

The salutogenic house of tomorrow

Richard Mazuch
Director of Design Research and Innovation, IBI Group

With an increasingly ageing population facing chronic health challenges and decreasing filial support, one's understanding of healthcare strategies must be recalibrated...

No – deconstructed, reconstructed and rebooted. The focus must be toward delivering a 'new look' service embedded within the community. This could range from assisted living, self-care, tele-care and tele-medicine within a single housing unit, to multiple units supported by social care services, nurses, doctors, physiotherapists, occupational health visitors, psychiatric nurses and local pharmacists.

Chronic and lifestyle-related diseases are on the rise, and healthcare services are struggling to keep up with the consequent accelerating demand. Simultaneously, we are finding new ways of taking control of our personal health and wellbeing. Increasingly, the goal is to establish a long and fulfilled lifestyle addressing preventative as well as curative health management regimes. We have a very real opportunity to deliver optimal therapeutic environments that are supportive of wellbeing, diagnostics, treatments and recovery, in new settings such as the home and within the public realm.

How can the design of tomorrow's home symbiotically respond and evolve to the ever-changing needs of an ageing population and its healthcare requirements? Can this be achieved in an innovative, elegant, supportive, dignified and exciting way, without it appearing mentally and visually debilitating, degrading and stigmatising? How can we reverse the perception created by the usual proliferation of awkward hinged/swing metal grab rails, handrails, frames, slow moving stair-lifts and inappropriate, awkward looking furniture, together with an eclectic variety of dated fittings?

Time for a new paradigm- Reinventing domestic cells

Individual spaces and components that constitute the traditional perception of the typical home will have to be dismantled to address the health and wellbeing issues of today and tomorrow. These salutogenic spaces are to be flexible and agile to adapt to 'Ageless', 'Multigenerational' and 'Multi-morbidity' scenarios. Individual domestic living cells, such as the long unedited bedroom, will have to be re-assessed in depth. We spend approximately one third of our life here. We may be conceived, delivered and indeed die here. We reboot our mind and body here daily to empower us to engage with a new day.

> **Technology and communication networks are examples of real-time clinical telehealth and telecare that can help alleviate the overburdened global healthcare system.**

Lack of sleep increases the risk of medical conditions including diabetes, heart disease, obesity and ultimately shortens life expectancy. Recent research informs us that lack of sleep costs the UK £40 billion a year. What can we do to ameliorate the situation? Healthcare insights and evidence-based research are to be harnessed and embedded in our designs. We have to consider:

1. What are the health issues? These may be sleep apnoea, respiratory problems, snoring, sundowning, incontinence and restless leg syndrome.

2. What are the dangers? Possibly temperature drops, dehydration, infections, sound/air pollution, falls, walkabout, mental health, darkness, anxiety, night time navigation.

3. What may be the interventions, both in terms of assistive design and technology?

Remarkably, many solutions may have little or no cost impact, such as: correct colour ways, bed inclination, amber illumination, bed/WC orientation and biophilic design. More exotic solutions may be the Med Bedhead, sensory doors, Robotics, smart floors, LED WC seats, LED pillows, Axo suits, Toto WC/Bidets, ODE emitters and Tomek fittings.

This brief investigation touches solely on issues related to bedroom design and its impact on health and wellbeing. There are effectively another twelve domestic cells within the envelope of the home which require similar interrogation and development.

Key ergonomic and anthropometric data will help design a supportive home with details, fabrics and finishes, equipment and devices designed to accommodate the ageing body: its predicted postures, movements, weight, size, properties and cognitive abilities. Design tools, such as virtual reality, augmented reality and sense sensitive design will ensure successful outcomes.

Technology and communication networks are examples of real-time clinical telehealth and telecare that can help alleviate the overburdened global healthcare system. Companies such as Amazon, Google and Microsoft are actively progressing to digitize our homes. With high definition video tele-healthcare systems, doctors and nurses will be able to hold virtual consultations with patients, remote from surgeries or hospitals in a "virtual ward" scenario. Monitoring sensors can be used to capture and transmit physiological data e.g. Tele-ECG devices and monitors. There are already successful examples of real-time clinical tele-health, such as tele-mental health, tele-audiology, and tele-nursing.

A clear understanding of the ageing process, the maturation of the body systems, physiology and sensory receptors, together with a true comprehension of related medical issues, morbidity levels and salutogenic needs, will clearly inform the design of tomorrow's home. Key design features of the future salutogenic home will also incorporate spaces for diagnosis, treatment, healing and ultimately sustained and supportive wellbeing which will define the overall design solutions.

Let us embrace today's challenges, deconstructing, reconstructing and rebooting them into unique forward-looking salutogenic homes of the tomorrow focusing on key design features supportive of multigenerational health and wellbeing. It has been said that "the best way to predict the future is to create it" "abeamus" let's go do it!

Photo credit: Image courtesy of Richard Mazuch

A design revolution for living aids

Clare Cooper
Co-Director, ellihome

In the autumn of 2013, my sister and I were 18 months into developing our first venture together — a social enterprise that offers moving, down-sizing and ageing-in-place services to older people and their families in Scotland[1].

During that time, we met Nancy, an Occupational Therapist by training, who shared a distressingly familiar story involving one of our clients. This story highlighted the problems with existing daily living aids, such as grab rails, shower stool and toilet frames. She had advised our client that these items were needed for her to remain safe and independent in her own home. The response was heart-breaking.

"It's so distressing to see how unhappy she was at the thought of having to have these products in her home", Olivia said. "She knew she needed them but all she kept saying to me was that they were so ugly, that they would make her home look like a hospital and make her feel like an invalid. It really upset her." "I know" I said, "I wouldn't want them in our home either". I paused. "Why don't we try to make beautifully designed grab rails, shower stool and toilet frames ourselves — and chair raisers too! The existing options completely and utterly destroy the look of your furniture. Having to use what's on the market now would utterly depress me beyond words too."

And so, our second venture together was born.

Fast forward to 2018 and our plans to design and manufacture beautiful daily living aids for older and less able people is close to fruition.

Over the course of our journey, we've understood just how much and how quickly the world is ageing. We've learned just how important aesthetic matters are to wellbeing and how being able to express personal style can hugely affect our self-esteem. We've conducted one-to-one interviews with older and less able people, which confirm that as we age, our emotional attachment to our home grows.

This should not be surprising, after all, our homes will have become the repository of many things. Memories are one, connections to friends and family who live nearby another, and all the things we have collected over the decades. There is overwhelming evidence that as we get older, our preference is to stay independent in our own homes for as along as possible.

But how can we future proof our home to allow us to do just that and how can we break away from the solely needs-based response models that currently dominate? What we need to offer is truly user-driven models that support active, healthy ageing and galvanise our wellbeing.

Over the past three decades or so, an approach called 'ageing in place' has been developed. This approach helps us to work out what products, services and conveniences will enable us to stay safe and independent in our own home. Generally, it focuses on Home Adaptations — things we can do to remodel our home to make it easier and safer for us to stay there, such as wheelchair accessible wet rooms and redesigns of the kitchen. It also includes Daily Living Aids, such as the ones my sister and I are on the verge of manufacturing. But up until recently, the quality of their design has been secondary to their function, resulting in medical looking products that feel overwhelmingly institutional. The result is to stigmatise their users in a negative and unnecessary way.

> ## What we need to offer is truly user-driven models that support active, healthy ageing and galvanise our wellbeing.

ellihome bathroom layout

Yet baby boomers and the generations behind them have become accustomed to high design standards in the everyday products they take for granted — from their iPhones, to their cars. Our research, and the research of others, bears out that this demographic expects no less from the household equipment they purchase to retain their independence and wellbeing.

With public sector service provision diminishing, due to reduced funding and stringent application of the Fair Access to Care Services criteria (FACS), there is no doubt that in the area of assisted living, there is potential for the consumer market to develop.

But for that potential to be realised, everyone involved in creating homes and home environments for older people needs to see this longevity revolution through new eyes. They must recognise the vital contribution design makes to all our lives, not only in smart technology and breakthrough innovations in genetic engineering, but in the simple everyday things like the grab rails, shower stool and toilet frames that ellihome[2], our new business, is focusing on.

1   www.thehomestraight.org.uk
2   www.ellihome.com

Photo credit: Image courtesy of Elli (Assisted Living Technology) Ltd.

Designing robots to look after our future selves

Sebastian Conran
CEO, Consequential Robotics

We have been using robotic devices in our homes for decades. The sewing machine, washing machine, dishwasher and TV remote are all robotic, labour-saving devices that you will find in practically every household living above the poverty line. However, these devices are mainly designed to repeat one process – they are not autonomous.

Many of us are also now buying into the new generation of Internet of Things (IoT) enabled devices, like the Amazon Echo and Google Home, which operate the lighting, heating and CCTV, and can order an ever-increasing variety of goods, including groceries. The big difference between the existing situation and the next generation of home robotics is autonomy and physical flexibility. These will be multifunctional devices that not only obey our commands, but also anticipate situations, needs and wants, and reliably act on them appropriately and safely. They will ask you what you want for dinner, order the fresh ingredients, cook and serve it to you

and clear up afterwards (they will also notice whether you are enjoying a balanced diet). These labour-saving servants will also help look after us in later life as, inevitably, our bodies and minds begin to fail.

In the near future it will be social/companion robots that will share our personal space, interact with us and with each other, to provide emotional engagement and entertainment. They need to be suited to robot-human interaction, as well as robot-device interaction. They could also discreetly help monitor our health, through wearables like bracelet sensors and smart mirrors. They will observe our body language, tone of voice, behaviour and adherence to normal routine, and anticipate bodily needs, like medicines, food and liquid intake.

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omniseat

> # Companion robots need to be robust, adaptable and able to communicate their intentions and feelings without necessarily using voice.

inhabited home, which is significantly more difficult than a road, where other vehicles obey rules.

Rethinking the basics

Domestic stairs conventionally require legs to scale them. The trouble is that legs can use up to 30 times the amount of energy to operate than smart omnidirectional wheels. So, let's expect more lateral living, with smooth floors in the future, or maybe a robotic version of a funicular stairlift that looks like a simple handrail – that humans can use too.

As optical and touch sensors become increasingly more sensitive and sophisticated, they will demand more and more computing power. Moore's law of exponential improvement of processor performance is finished – we have hit a barrier where things cannot get much smaller. Meanwhile, we are still waiting for someone to actually make a Quantum super-computer that works for longer than a nanosecond, to give us the level of reliable high-performance that is required to process all the data from sensors and memory.

As we get older, we become more physically and mentally fragile. Due to this, our design studio is actively developing things such as smart bathrooms that help prevent and detect falls, as well as monitor our physical health through observation and analysis of our lavatorial waste. They can also be comfortable, calm and meditative spaces.

We have had domestic dishwashers for over half a century, but now we are also collaborating on the design of kitchens that can fully prepare and cook meals from fresh ingredients, as well as clean up afterwards (ironically, as cooking is one of my great personal pleasures in life!). We are also developing a comfortable robotic chair that can move omnidirectionally and autonomously around your home. It can raise up to the sink or cooker, and help you get in and out of bed. Vitally, all of this needs to look like something we aspire to have in our homes – not in a hospital ward.

In 20 years' time, when I am 83, I fully expect there will be many universal autonomous robotic devices in my home to help with home chores such as cooking, ironing and making the bed, as well as helping me out of a chair/bed/bath. This said, I don't expect or want them to look much like human beings and hope to see them featured in the then equivalent of aspirational lifestyle magazines. Outstanding product design has a vital role to play in ensuring that these devices are emotionally things we crave, not just physically need.

Photo credit: Images courtesy of Consequential Robotics

Jeeves the robot; I don't think so...

Regarding physical, quasi-humanoid robots, with current material and digital technologies we can't get near to reliable functional behaviour, nor the cognition and performance of a human toddler, let alone the legendary Jeeves. The fact is that no research laboratory on this planet is close to making an autonomous robot that could open the door, walk into your home, boil a kettle of water and make you a cup of tea, let alone open and serve a bottle of champagne!

One approach is to build devices that think and operate very much like familiar animals; from their senses and decision-making processes, all the way through to their bodies and behaviours. The Consequential Robotics MiRo robotic pet is an example of this, based on the simple premise that animals are familiar and have qualities that are desirable in today's social robots – we all speak to our pets without any idea of their understanding.

Companion robots need to be robust, adaptable and able to communicate their intentions and feelings without necessarily using voice (Alexa can be so intrusive!).

Despite these challenges, there is still a huge demand for friendly-looking, flexible autonomous devices that will physically carry out dull, dirty and dangerous jobs, such as emptying our bins, deep mining or decommissioning redundant nuclear power plants. Apart from in Japan, sadly it is mainly defence organisations which seem to have the sufficiently deep pockets to fund this vital research and innovation.

There are emerging materials and fabrication technologies, such as graphene and 3D printing, which will make our devices lighter, stronger and more compact. Quiet and powerful electric motors and power cells are also making great progress, due to the pent-up demand for efficient electric autonomous transport. There are simple things to overcome, like navigating a cluttered