INTRODUCTION

Developers invest billions of pounds every year, creating new and improved homes to attract buyers and/or renters to their properties. Yet people are rarely consulted about their preferences for their homes and neighbourhoods – be it in terms of the features inside the house, transport connections, or communal amenities.

This research project, undertaken by BuroHappold with the support of Folkestone Harbour Limited Partnership, the developer of Folkestone Seafront, provides some insights into the preferences of the next generation’s aspects of living.

In the first stage, the following report looks at the basic dynamics of migration trends in London. In a first stage, the following report looks at the basic dynamics of migration trends in London and the South East. Based on secondary data, the report explores the push and pull factors for people who leave London and settle elsewhere in the United Kingdom.

In a second stage, BuroHappold undertook a survey to understand lifestyle choices of millennials and young families in London. The survey looked beyond aspects considered standard for a good development and neighbourhood today – such as green, open spaces, and walkable environments – and focused on preferences regarding innovative and technology-driven solutions to living.

Finally, the survey results are put in context of best practices in sustainable housing development and proven technologies that address some of the lifestyle choices identified in the survey. The report concludes with a series of recommendations for developers.
PUSH FACTORS: LONDON IS BECOMING TOO EXPENSIVE
MIGRATION TRENDS WITHIN THE UK
DEMOGRAPHICS AND MIGRATION

As London’s population continues to grow, people will find it harder to get appropriate and affordable housing within Greater London. The number of new residencies being built each year falls well short of the demand levels. Already now, Londoners are increasingly moving out of the city to find either a home in another large UK city or a smaller town within commuting distance to the capital.

London’s population growth is based on natural demographic changes (higher birth rates than death rates) and international migration of people moving to the city from outside the UK, but not on internal migration.
THE UK CONTEXT

Compared to other European countries, the United Kingdom has a relatively high rate of internal migration. Between July 2014 and June 2015, there were approximately 2.8 million moves between local authorities in England and Wales – about one in twenty people moved.

LIFE-CYCLE OF MOVEMENT

Young adults enrolling in higher education or starting their first job are most likely to move. Young families with very young children also move relatively often – likely due to a need for larger homes. The level of movements gradually declines as people grow older and become more settled in their jobs and/or have children in school-age. There’s a small rise in movements for people in their late seventies and early eighties, possibly because older people look to downsize their homes or move into homes with access to health care and support.
THE INFLOW AND OUTFLOW OF PEOPLE

People in London and the South East move the most. In South East England, the outflow of people is more than compensated with people moving into the South East. The South West and East of England also have a higher inflow of people than outflow. In London, however, almost 78,000 more people are leaving than coming into the city. Again, this does not include migration from abroad, a large portion of which comes to London.

In the Northern regions and Wales, migration is generally lower and the inflow and outflow of people are balancing each other out.

In the following, we are focusing on London and why there are many more people leaving London for other UK cities and towns than arriving from those places.
WHO IS LEAVING LONDON?
GROWTH AND DEMOGRAPHICS

London’s population is rapidly growing. However, the growth comes from natural demographic changes, meaning that there are more births than deaths, and from international migration.

There were over 77,000 more births than deaths between July 2014 and June 2015 and 134,000 more people came to the city from outside the UK than left the city to a destination abroad.

As we described earlier, whilst natural demographic changes and international migration contributes to London’s growth, the city loses a considerable number of people to other places in the UK through UK internal migration.

<table>
<thead>
<tr>
<th>AGE GROUPS</th>
<th>BIRTHS</th>
<th>DEATHS</th>
<th>NET INTERNAL MIGRATION (OTHER PARTS OF UK)</th>
<th>NET INTERNATIONAL MIGRATION (OUTSIDE OF THE UK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-19</td>
<td>128,520</td>
<td>613</td>
<td>-42,767</td>
<td>40,533</td>
</tr>
<tr>
<td>20-29</td>
<td>-</td>
<td>340</td>
<td>37,952</td>
<td>44,829</td>
</tr>
<tr>
<td>30-39</td>
<td>-</td>
<td>754</td>
<td>-30,412</td>
<td>19,429</td>
</tr>
<tr>
<td>40-49</td>
<td>-</td>
<td>1,596</td>
<td>-16,403</td>
<td>11,925</td>
</tr>
<tr>
<td>50-59</td>
<td>-</td>
<td>3,266</td>
<td>-10,424</td>
<td>7,683</td>
</tr>
<tr>
<td>60-69</td>
<td>-</td>
<td>5,783</td>
<td>-8,929</td>
<td>5,952</td>
</tr>
<tr>
<td>70+</td>
<td>-</td>
<td>37,798</td>
<td>-6,552</td>
<td>3,550</td>
</tr>
<tr>
<td>TOTAL</td>
<td>127,807</td>
<td>50,150</td>
<td>-77,535</td>
<td>133,901</td>
</tr>
</tbody>
</table>
WHO IS LEAVING LONDON?

YOUNG FAMILIES OUT – STUDENTS AND GRADS IN

There were almost 78,000 more people leaving London for other parts of the UK than arriving in London from within the UK. Almost forty percent of them were between thirty and forty years old. It is also this age group whose out-migration has rapidly increased in the last few years, indicating that young families might find it increasingly hard to afford the quality of life they want within the city.

Twenty-somethings are the only age group where more people are migrating to London from other parts of the UK than vice-versa, pointing to the fact that young people move to London for education and graduate jobs, and the quality of living accommodation is not so high on their list of priorities.
WHY ARE PEOPLE LEAVING LONDON?
PREVIOUS SURVEYS

In 2015, Rebecca Ross, a post-doctoral fellow at Central Saint Martins, asked Londoners who recently left or were planning to leave the city a series of questions via a web form to provide some personal stories that go beyond the official statistics and narrative. A few of these stories were displayed on digital billboards in London and the survey data was made publicly available (www.londonischanging.org).

AFFORDABILITY

A review of the answers to the question “why do you relocate from London” shows that affordability is a key driver for people leaving London. Londoners increasingly struggle to pay down a mortgage for a home, or pay the rent for their small studio apartment. The resulting word cloud (see next page) highlights that the sentiments related to cost and income stand out - price, salary, pay, and financially. Digging into the answers a bit more deeply, other explanations also emerge.
WHY ARE PEOPLE LEAVING LONDON?

PHYSICAL AND PSYCHOLOGICAL WELLBEING
While living cost is the overwhelming reason for the people who answered the call to tell their stories, there also seems a desire to live a more relaxed life, be closer to open and green spaces with better air quality, and a longing for a closer-knit community.

CREATIVE INDUSTRY
People feel that they and their business can thrive equally well if not better in other places. Especially artists and makers seem to voice this reason for moving.

ESCAPING THE CROWDS
Respondents indicate that they are increasingly tired of the crowds on public transportation, but also in coffee shops, restaurants, and cultural venues.

LARGER HOMES
When Londoners leave the city, they are seeking a more relaxing life, hope to get on the property ladder and move into larger homes for expanding families, but also be closer to nature. Especially for young families, these factors seem to play a major role.
WHERE ARE PEOPLE FROM LONDON GOING?
WHERE ARE PEOPLE FROM LONDON GOING?

KEY DESTINATIONS

A quick search on Google shows what destinations people most search for when looking for where Londoners are moving.

The result includes cities abroad like Berlin or Lisbon, larger cities within the UK like Bristol, and smaller cities within the South East of England.

Google’s suggested drop-down menu (see image) is based on the most popular search queries over several years of its users in the United Kingdom (Google does not make it public over how many years). As search queries change, these suggestions also change over time.

The suggested search results correspond also surprisingly well with the data from the Office for National Statistics – there are three key destinations that Londoners chose:

- SMALLER CITIES/TOWNS IN COMMUTING DISTANCE TO LONDON
- OTHER LARGE CITIES WITHIN THE UK
- OTHER CAPITAL CITIES ABROAD
WHERE ARE PEOPLE FROM LONDON GOING?

DESTINATIONS OF MOVERS FROM LONDON

Between mid-2014 and mid-2015, a total of 753,000 left their London borough. 50% of those Londoners who moved, did not leave London at all, but moved to another borough within the city; 12% went overseas; and 38% went to another place in the UK. Of the 38% leaving for another place within the UK, over a third (108,000) moved to the South East and another third moved to the East of England. Looking at the level of counties, 23,230 moved from London to Kent. Of those, 7,800 moved to East Kent.

[Map showing distribution of movers from London to different regions.]
WHERE ARE PEOPLE FROM LONDON GOING?

MOST POPULAR LOCAL AUTHORITIES

A surprising number of people leaving London are moving to Scotland. Apart from this, however, people are moving to either another large city in the north such as Birmingham or Manchester or a smaller city or town within the South of England, but still in potential commuting distance to the capital, meaning around a one hour train ride away.

Focusing on the South and those areas within commuting distance from London, the most popular local authorities are Brighton and Hove, Thurrock, Dartford, Epping Forest, Elmbridge, Medway, Dartford, Hertsmere and Luton.

MOST POPULAR LOCAL AUTHORITIES (BESIDES LONDON BOROUGHS) AND SHEPWAY BETWEEN MID-2014 AND MID-2015
(SOURCE: OFFICE FOR NATIONAL STATISTICS MID-2015 MIGRATION DATA AND SQUARE MATRIX INTERNAL MIGRATION BETWEEN LOCAL AUTHORITIES IN THE UK)
WHERE ARE PEOPLE FROM LONDON GOING?

CITY LIFE VS. FAMILY LIFE

Looking at the age groups of the inflow for these most popular local authorities for Londoners to move to shows a relatively striking difference between those in their twenties and those in their thirties.

Those Londoners in their twenties who leave the capital move foremost to other major cities in the UK. Those

Londoners in their thirties and forties are much more likely to move to a smaller place within commuting distance to London. This is likely to indicate that people in their twenties are still looking to establish their careers, but people in their thirties want to keep their jobs while settling into their own place or finding a bigger place for a growing family.
PULL FACTORS: PEOPLE’S PREFERENCE FOR THEIR NEW HOMES
THE SURVEY & WHO RESPONDED
PEOPLE ARE RARELY CONSULTED

Following on from the previous research, BuroHappold undertook a large-scale survey in collaboration with Folkestone Harbour Limited Partnership and with the help of the data-driven firm Fast Forward to understand people’s preferences.

While the survey was open to everyone, it focused foremost on graduates, young professionals, and young families living in London. We received a total of 1,266 responses with the age group distribution represented on the right. As the response rate for the age categories of 55-64 and 65+ was relatively low, the analysis focuses on the age categories between age 16 and 54.

Developers invest billions of pounds every year, creating new and improved homes to attract buyers and/or renters to their properties. Yet, people are rarely consulted about what their preferences are for their homes and neighbourhoods – be it in terms of the features inside the house, transport connections, or communal amenities.

The following provides some insight into the preferences of the next generation’s aspiration of living.
PEOPLE’S PREFERENCE FOR A PLACE
YOUNG PEOPLE WANT TO LIVE IN LARGE CITIES

Young people want to live in large cities defined as places with a population of 250,000 or more. A majority among them wants to live in a metropolis like London. Once people have families however, they prefer smaller cities and towns.

It could be that those young people who want to live in large cities today, will continue to do so. However, without undertaking a longitudinal study, it is difficult to make any conclusions regarding a general shift towards city living.
PROXIMITY TO WORK, PUBLIC TRANSPORT, AND SAFETY ARE HIGHEST PRIORITY

For most people, safety and security, proximity to work and public transport have a high priority. Over sixty percent of respondents also consider shops within walking distance, high-speed internet access, and a high quality public realm as important or very important.

While proximity to nature is a high priority for many, nature does not need to be the seaside. Proximity to seaside is actually a relatively low priority for a majority of the respondents. Good schools are not considered a high priority by many, which most likely reflects the fact that most respondents do not have children (yet).

FAMILY AND FRIENDS SHOULD BE CLOSE-BY, GOOD NEIGHBOURS IS A NICE ADD-ON

Proximity to family and friends has often been mentioned as another factor with high importance. Great neighbours, in contrast, are nice-to-have, but not a necessity. Only 16% of respondents would be very interested to form close relationships with their neighbours. Most respondents are ‘interested’ or do not really care.
PEOPLE’S PREFERENCE FOR THEIR NEIGHBOURHOOD
PEOPLE’S PREFERENCE FOR THEIR NEIGHBOURHOOD

RENEWABLE ENERGY AND HEALTH CENTRES

Generally speaking, people find proximity to work and public transportation – thus characteristics of a place – more important than the actual neighbourhood amenities most of which a majority of people see only as medium or low priority. Among the neighbourhood amenities, 57% of respondents consider renewable energy and health centres as a high priority. For these amenities, 30% of respondents are willing to pay £10 per week, 25% of respondents £20 per week, and 14% of respondents £30 per week.
Interestingly, car sharing systems and other sharing systems among neighbours do not seem a high priority (see previous page) – even though public transport was considered a high priority for the place.

Age does not seem to make a difference here. 60% of respondents then also said that it is unlikely that they would give up their own car if a car sharing system existed. One possible reason could be that respondents do not own a car and prefer public transport over any car-oriented mode of transport.

These results however counter the often cited hypothesis that millennials have bought into the sharing economy.
GROCERY STORE (AND A LOCAL PUB)

93% of respondents prioritise a grocery store in their neighbourhood as high or highest priority, 63% find the local pub a high or highest priority.

Less of a priority are hairdresser and clothing store. While a hairdresser is probably not frequented enough to make it a high priority, clothing is increasingly bought online.
PEOPLE’S PREFERENCE FOR THEIR HOME
OWNERSHIP IS STILL PREFERRED

85% of respondents would rather own their home than rent. The age group 16-24 and 25-34 have a slightly lower preference for owning with 77% respondents preferring ownership in the age group of 16-24 year olds and 80% of respondents preferring ownership in the age group of 25-34 year olds.

It is unclear if this slight difference between the age groups is explained by the age or by a longer lasting trend towards renting. It is however clear that the aspiration to ownership cannot necessarily be fulfilled by London’s housing market. Therefore, people will look for options further out of the central city.
SINGLE HOME IS STILL THE ASPIRATION

Most people still look to own a single home, albeit the preference is less pronounced for the age group of 16-24 year olds.

Again, this could be due to their current circumstances as young adults without children or due to a potential trend towards a preference for life in a denser urban environment.
SUPER-FAST INTERNET IS KEY TO ONE’S HOME

Interestingly, super-fast internet is considered highest priority by a large majority of the respondents. 89% of respondents see it as highest or high priority. Only 2% of respondents consider it a low or lowest priority.

This indicates that the internet, and high-volume internet traffic such as video and music streaming, has become so ubiquitous that almost no one wants to live without it anymore.

Other important amenities are generous storage space and garden – confirming probably that the single home is still a high aspiration for most people.

For these key home amenities, 71% of respondents are willing to pay between £10-£30 more per week. Only 13% of people would rather forgo their top three home amenities than pay an additional fee.
Almost half of the respondents (46%) like the idea of a strong property management team. However, almost a third of respondents (30%) feel that they would not want to live in an environment where they are encouraged to conform to certain standards.
MOST PEOPLE ARE EXCITED ABOUT TECHNOLOGY

When asked if they would be excited about the management team using technology to improve the development in regards to safety, energy efficiency, and management, 71% of respondents said that they are very excited or excited. However, only 20% of respondents would be willing to pay an additional fee. This suggests that the inclusion of technology solutions needs to find alternative revenue streams and/or demonstrate significant cost savings to offset the whole lifecycle cost of the technologies and limit any cost to residents. A rigorous business model needs to be developed for these technologies.

There is less agreement on the question if they would be willing to share their anonymous data with the management team. 43% of respondents said they would be willing to share their data while 37% of respondents would not want to do so.
WHAT ARE OTHER DEVELOPERS PROPOSING?
EMBRACING CONSUMER DEMANDS ON SUSTAINABILITY AND TECHNOLOGY

Some new developments in other parts of the United Kingdom and the wider world are addressing the consumer demands identified in the survey.

The survey responses show that the most mobile age groups (20-40 years old) look for a vibrant city or town that is within easy access to public transportation to get to the larger city and comprises a high-quality public realm.

In addition, people expect their new neighbourhoods to use renewable resources and provide a series of communal amenities including health centres and communal working spaces. In their homes, they expect to have ample storage space and be highly energy efficient and environmentally friendly.

They are generally excited about technology solutions to improve the safety, energy efficiency, and management of the development and take fast-speed internet for granted.

Developers (and, in some cases, city governments) are beginning to embrace these consumer demands and create future-oriented residential and mixed-use developments that embrace sustainability and technology.
**THE PRECEDENTS**

The following is a selection of six developments that BuroHappold considers relevant for this study.

They were chosen because they are located outside of the core city, but with train connections to the city within a commuting distance (depending on the location this means between 30 minutes and 1.5 hours).

They predominantly cater to families and young entrepreneurs that do not want to pay the price of living in the core of the city, but still seek to live in a vibrant neighbourhood.

Each of the examples highlights a different aspect of the consumer trends that the survey revealed, be it energy efficient living, high-quality public realm, or co-working spaces within the residential mix. The examples do not suggest that they should be replicated, one-to-one but they might serve as inspiration for the concept and design stages of any residential/mixed-use development that caters for this type of residents.

Following on from the case studies, we describe a set of specific technologies that might be considered to address the consumer demand trends. They are all proved and tested technologies that are being integrated in a number of developments across the world.
CASE STUDY 1: ONE BRIGHTON, BRIGHTON

There are few examples in the United Kingdom that successfully demonstrate sustainable and future ready residential and mixed-use development. The One Brighton housing development is one of them.

Located close to the main train station, it was the UK’s largest private car-free development when it opened in 2009. One Planet Living principles were consistently applied in the process of design, development, and management. According to a BioRegional report, the development of 172 apartments plus offices has proved to be an environmental and commercial success.

Water consumption is 27% less than the UK average and greenhouse gas emissions is reduced by 60% compared to average UK housing stock. There was also evidence of higher investor returns with yields in the region of 6% compared to 5% in the surrounding area.

COMMUNAL AMENITIES
- Car club
- Sustainable energy resources such as PV panels and on-site biomass boiler
- Café
- Public access right through central courtyard
- Rooftop allotments for food production

BUILDING AMENITIES
- Sustainable construction materials (e.g., natural clay blocks with wood fibre insulation)
- Water efficient bathroom facilities

REFERENCES
CASE STUDY 2: HOVE, BRIGHTON
ZEDFACTORY.COM/COPY-OF-BEDZED

Hove, is 15 minutes away from Brighton and 1.5 hours from central London. ZEDfactory, widely recognised for award-winning projects such as BedZED in south London, and Harbourview Development conceptualized PortZed, a mixed-use zero carbon scheme on Kingsway in Hove.

The development would have comprised of 67 residential units built over shops, offices, and support facilities. The scheme was however rejected by the Brighton & Hove City Council’s planning committee for design reasons. While the sustainability credentials were welcomed, the scheme was considered intrusive and overbearing.

Neighboring residents fought the scheme arguing that it would take light from their homes opposite Kingsway. The development is nevertheless interesting as it would have addressed consumer trends and pushed boundaries of contemporary sustainable urban development.

COMMUNAL AMENITIES
- Visitor center & green business hub
- Landscaped deck for amenity space
- Renewable energy system (i.e., solar thermal and PV arrays, communal biomass boilers)
- LED external lighting system
- Commercial spaces at street level
- Car pool scheme
- Meeting and business facilities

BUILDING AMENITIES
- High specification building envelope for energy efficiency

REFERENCES
WWW.REGENCYSOCIETY.ORG/PORTZED-REJECTED.HTML
CASE STUDY 3: BEACON, NEW YORK
LOFTSATBEACON.COM

Located just outside of Beacon, a 15,000 people town north of New York. Beacon is located in a beautiful setting between the Hudson River and Fishkill Creek and considered a quaint little town with cultural amenities such as the world famous Dia:Beacon art gallery.

Its main street is walkable and has restaurants, cafes, and shops. The development is a ten minute bike ride to central Beacon and a 1.5 hour train journey to central Manhattan.

The first units opened in 2009, but further build-out of the development is still going on. It is targeted at artists and professionals that need access to the City once or twice a week, but have their studios/work place at home. Each unit is conceptualized as 30% living space and 70% commercial/office space.

According to the Leasing Office, the development is fully occupied with 60% artists and 40% professionals. While sustainability aspects have not played a significant role initially, they are now considered in the further build out.

COMMUNAL AMENITIES

- Fitness centre
- 12 acres landscaped grounds with seating and barbeque area
- On-site storage facilities to rent
- Gallery and community meeting space for events
- Outdoor patios
- Indoor bike racks and storage facility
- 24-hour emergency maintenance

BUILDING AMENITIES

- Energy-saving technology wherever possible (e.g., appliances and lighting)
- Spacious storage room (e.g., walk-in closets)
- High-speed Internet

REFERENCES
INTERVIEW WITH LEASING OFFICE REPRESENTANT 14/12/2016
WWW.LOFTSATBEACON.COM
CASE STUDY 4: ASPERN, VIENNA
ASPERN-SEESTADT.AT

Located in Aspern, a 30 minutes metro ride away from central Vienna. The 2.4 million square metre mixed-use masterplan will be fully completed by 2030. The district provides urban living close to nature (i.e., a national park and a lake) with quality public realm, walkable paths, and shopping and cultural opportunities.

In addition, energy efficiency is central to the entire district enforced through strict building standards. An Aspern Smart City Research team uses real-time data from the development to improve energy efficiency. Through a smart ICT system they collected data from the buildings and the smart grid to better balance the demand and supply.

Various developers built or are building residential buildings to create an interesting architectural mixture. The project “Seestern Aspern” (www.seestern-aspern.at) that opened in 2015 is especially interesting in this context.

It comprises of 28 residential units, 280 sqm communal space, and 170sqm commercial space.

The development targets residents who prefer co-working spaces to their home-office. Before the development opened, all apartments were reserved – which might have to do with the fact that it is a member-based development project where future tenants helped developed the project.

COMMUNAL AMENITIES
- Communal working space
- Wood shop
- Storage space
- Sauna
- Communal kitchen with indoor play-area for children
- Rooftop with garden
- Multi-functional space
- Commercial spaces

BUILDING AMENITIES
- Flexible apartment layout

REFERENCES
WWW.EINSZUEINS.AT/PROJECT/SEESTERN-ASPERN
WWW.PARQ.AT/PARQSTATIC/UPLOADS/33220-43442-29800-58163/SEESTERN_111018_INFOPAKET.PDF
WWW.ASCR.AT/EN
CASE STUDY 5: OERLIKON, ZURICH
MEHRALSWOHNEN.CH/HUNZIKER-AREAL/QUARTIERTEIL

The Hunziker-Areal is a mixed-use development in Oerlikon, the once industrial zone outside of Zurich. The development includes a grocery store, small businesses and social amenities such as tailoring ateliers, bakery, yoga school, hair dresser, restaurants, nursery.

It is for families that look for high-quality living to more moderate prices than in the city centre. The project, conceptualised and developed by a co-operative with long-term stewardship, prides itself for the sustainable approach that focuses on minimizing resources by building on new technologies and high-quality architecture.

The development has a variety of rental apartments, from family apartments with several rooms to satellite units of one-to-two bedrooms with a bathroom around a communal living room for student living or shared living for the elderly. The development is considered a success with 1,300 residents of which 200 are children. The development is very popular and has currently no vacancies.

COMMUNAL AMENITIES
• Music rooms
• Communal space with kitchen
• Play room for children
• Guest house for residents to rent for their guests
• Electric cars, electric vehicles, bikes for sharing
• Internal networking platform for residents and businesses

BUILDING AMENITIES
• Live/work units
• High-end appliances

REFERENCES
WWW.NZZ.CH/ZUERICH/WARUM-WOHNUNGEN-NEBEN-EINER-KEHRICHTVERBRENNUNG-WEGGEHEN-WIE-FRISCHE-BROETCHEN-1.18422318
CASE STUDY 6: AARHUS, DENMARK

This project is part of the Bassin 7 masterplan at the former port of Aarhus, Denmark’s second largest city. While much closer to the city centre than the previous examples, it is an interesting case study for developing a new mixed-use neighbourhood along the waterfront that puts great emphasis on high-quality public realm with social, cultural, and recreational interaction. The public realm was designed before the buildings. It includes a beach zone with bath and beach huts, swimming pools, amphitheatre, café along a promenade that acts as the link between the city and the port. There are seven buildings proposed with a range of different styles: blocks, townhouses, and high-rises. The first apartments in the high-rise building “Aarhus” are ready for occupation in 2017.

COMMUNAL AMENITIES

- Private courtyard for residents
- Short distance to light rail, direct buses to city centre
- Underground parking spaces
- Communal garden as an extended living room
- Communal “village hall” for yoga, lectures
- Multi-use space that acts as a terrace in front of the building and simultaneously covers the parking areas

REFERENCES

WWW.DEZEEN.COM/2014/09/25/BIG-AARHUS-HARBOUR-BASSIN-7-BJARKE-INGELS
WWW.ARCHDAILY.COM/551290/BIG-DESIGNS-7-BUILDING-WATERFRONT-DEVELOPMENT-IN-AARHUS
WWW.BIG.DK/#PROJECTS-AAR
EXISTING & PROVEN TECHNOLOGIES
KEY TRENDS

BuroHappold works across a number of high-end mixed-use developments across the globe and there are four key trends that we are seeing increasingly embraced by developers and cities.

**INTEGRATED**
Integrated infrastructure systems pool resources over several systems (e.g., solid waste) as input to generate outputs of other systems (e.g., electricity, heating and cooling, water supply).

**SMARTER**
Smarter systems means that sensing technologies embedded in infrastructure provide real-time data to help improve efficiency.

**DISTRIBUTED**
Distributed systems are more decentralised systems that generate/store energy or water onsite.

**CIRCULAR**
A circular system keeps products, components, and materials at their highest utility and value. It aims to promote greater resource productivity by reducing waste.

EXISTING AND PROVEN TECHNOLOGIES

INT INTEGRATED

SM SMARTER

DI DISTRIBUTED

CI CIRCULAR

Integrated infrastructure systems pool resources over several systems (e.g., solid waste) as input to generate outputs of other systems (e.g., electricity, heating and cooling, water supply).

Smarter systems means that sensing technologies embedded in infrastructure provide real-time data to help improve efficiency.

Distributed systems are more decentralised systems that generate/store energy or water onsite.

A circular system keeps products, components, and materials at their highest utility and value. It aims to promote greater resource productivity by reducing waste.
TECHNOLOGIES THAT ADDRESS CURRENT TRENDS IN CONSUMER DEMANDS

The survey responses as well as the review of the case studies show that key consumer trends are emerging such as energy efficient buildings, high-quality and secure public realm, communal, and building amenities. For each of these categories, there are technologies that help improve the development.

In the following, we have put together a selection of technologies that address these trends.

1. Energy efficiency
2. High-quality and secure public realm
3. Communal/shared living
4. Home technologies
# Existing and Proven Technologies

## 1. Energy and Water Efficiency

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smart Power &amp; Water</strong></td>
<td>A grid and meter system that provides real-time data to users and utilities and allows for remote building and district-wide energy and water management.</td>
</tr>
<tr>
<td><strong>Grid and Meters</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Building-Scale Storage</strong></td>
<td>System for storing electricity from renewable sources, mostly using advanced, lithium-ion batteries.</td>
</tr>
<tr>
<td><strong>Net Zero Buildings</strong></td>
<td>Building that use the equivalent or less energy annually than it produces from renewable sources (e.g., solar panels, wind turbines, biomass boiler) on site.</td>
</tr>
<tr>
<td><strong>On-Site Water Recycling</strong></td>
<td>Systems that collects grey and black water and treat it onsite for flushing and landscape irrigation.</td>
</tr>
<tr>
<td><strong>Water Efficient Showers, Taps, Toilets</strong></td>
<td>Electric sensors that measures infrared light radiating from body to automatically start and stop water flow.</td>
</tr>
</tbody>
</table>
EXISTING AND PROVEN TECHNOLOGIES

2 HIGH-QUALITY AND SECURE PUBLIC REALM

**CENTRAL OPERATING PLATFORM (COP)**
Acts as the user interface and integration platform for the technologies within the development. Harvests data from all systems for analytics, generates reports and spots trends.

**LED LIGHTING SYSTEM**
Low-energy lighting to improve building and public realm security and safety at night and significantly reduce the cost of supply.

**CCTV SYSTEM AND VIDEO ANALYTICS**
Cameras in the public realm for security. Video Analytics to monitor, analyse and alert key security trends. Other features include footfall analytics, vehicle counting, automatic number plate recognition (ANPR) etc.

**DIGITAL WAYFINDING AND SIGNAGE**
Digital wayfinding and signage provides an interactive way for residents and visitors to get around.

**ENVIRONMENTAL MONITORING**
A combination of wired and wireless sensors to monitor environmental conditions within the building and public realm.
EXISTING AND PROVEN TECHNOLOGIES

2 HIGH-QUALITY AND SECURE PUBLIC REALM

BEST MANAGEMENT PRACTICES

EXISTING AND PROVEN TECHNOLOGIES

OUTDOOR “UTILITY” SERVICES

WASTE BIN SENSORS

Storm water management practices including green roofs, permeable pavement, rain barrels, sand beds, advanced tree pits, and landscaping.

Designs that integrate materials and structures that enhance the comfort of the outdoors, manage temperatures, and protect from wind/rain/snow.

Outdoor “utility” services such as Wi-Fi or charging stations embedded in street furniture allow for more flexible work environments.

Waste bins with sensor to monitor and evaluate station fullness and usage trends.
3 COMMUNAL LIVING

COMMUNITY HIRE SCHEME

Scheme that encourages individuals to rent/borrow rather than buy products.

CLICK FIX TYPE TECHNOLOGIES

Application to report and track non-emergency urban issues via Internet.

(ELECTRIC) CAR SHARING

A car club or other car-sharing model that allows residents of a neighbourhood/building to get rid of their own car and share the use of car with the community.

BIKE SHARING

A bike sharing system that allows residents to commute to the city centre and train station without using their own bike.
**EXISTING AND PROVEN TECHNOLOGIES**

**4 HOME TECHNOLOGIES**

**DIGITAL CONCIERGE**

Mobile application that offers residents a full concierge service and can be programmed to offer a range of services such as reservation services, front desk management, hot desk booking and/or amenity management.

**INTEGRATED ENTERTAINMENT SYSTEM**

Integrated audio visual systems managed via a central platform or application is a prerequisite for high-end residential developments.

**EMERGENCY ALERT SYSTEM**

Emergency system that alerts tenants on their mobile phone in case of emergency.

**BROADBAND FIBRE NETWORK**

Fast-speed Internet for home and office use.
RECOMMENDATIONS
CONSIDERING KEY COMPONENTS FOR A SUCCESSFUL DEVELOPMENT

Young Londoners increasingly struggle to find a place to live within the core city and create a home for their family. At the same time, they aspire to live in sustainable communities that are walkable, vibrant, and include future-oriented technologies. Developers that aspire to cater for these type of residents, thus might want to consider the following key components:

1. Accessibility to train station
2. Sustainable and energy efficient homes
3. Walkable neighbourhood with high quality public realm
4. Communal working space
5. Technology systems

1 ACCESSIBILITY TO TRAIN STATION

While homeworking is on the rise, many companies – including technology firms like Google or Facebook – still value the face-to-face interaction of their employees. One of the key factors to attract young families, with at least one parent working in London, is easy access into the city.

A shuttle bus or car hire system (e.g., Uber, Lyft) might be a valuable investment here. Lyft has increasingly worked with public agencies to solve the last mile problem from and to a train station.\(^1\) Another potential option could be bike or e-bike sharing systems.

\(^1\) [HTTP://BLOG.LYFT.COM/POSTS/2016/8/9/LYFT-LAUNCHES-FREE-RIDES-FOR-CENTENNIAL-COMMUTERS]
SUSTAINABLE AND ENERGY-EFFICIENT HOMES

Consumers have become more environmentally aware and clearly understand the benefit of energy efficient homes. Moreover, several studies have shown that energy efficient homes have a positive impact on house prices.\(^1\)

Developers might want to consider a range of measures – from smart grid systems to renewable energy sources such as wind and sun. It is crucial that the developer owns the data from any technology solution to be able to learn from and improve upon the chosen solution.

The preferred technology solution will need to be evaluated, but a highly sustainable and energy efficient development will attract the target consumer of young professional families.

WALKABLE NEIGHBORHOOD WITH HIGH QUALITY PUBLIC REALM

The survey responses clearly demonstrate that a high-quality public realm is increasingly valued by residents. They want to move around in a secure, clean, and pleasant environment. This often includes a range of key amenities in close proximity (short walking distance) from the grocery store to the pharmacy. Many respondents also considered a health centre close-by an important feature.

In addition, free public wifi and digital signage can help create a high quality public realm where people feel secure.

---

RECOMMENDATIONS

4 COMMUNAL WORKING SPACE
While live/home units are one option for those not commuting every day to London, communal work spaces are becoming increasingly popular. Compared to the sometimes isolating experience of working from home, they provide opportunities to network with other entrepreneurs and professionals as well as better amenities.

While it might not be viable to integrate communal working space within a development, there might be an opportunity for locating such a space nearby.

5 TECHNOLOGY SYSTEMS
Survey respondents were excited about technology to improve the safety, energy efficiency, and management of a development. Moreover, high-speed internet is considered essential – at home and in public.

This provides an opportunity to integrate smart systems such as smart meters, home security systems, or intranets for sharing and exchanging among residents.

The key for a successful integration of technology is a combined approach to data.
EVALUATING THE TECHNOLOGY

Any technology deployed needs a robust business model. To develop business models for each of the aspects recommended in this report is not within the existing scope, however, there are a few important considerations for evaluating different technologies:

- The benefits of the technology should outweigh costs.
- The procurement and ownership model of the technology will impact its success. A long term ownership model allows to maximize lifecycle value of the system deployed. Insight derived from the technology systems can be utilized in future phases of the development.
- The technology has to be fundable and align to the price-point of the development. Current research suggests that whilst technology is an attractor to the target demographic they may not necessarily want to pay more for this. Therefore, a developer should consider how value is articulated to potential buyers through marketing and branding material and ensuring that the technology is working hard for them to reduce capital and operational costs of the development to offset cost of deployment. Future revenue streams should be considered an additional bonus.
Buro Happold Engineering