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Tomorrow's City Centre

Tomorrow's City Centre:
Glasgow Agenda

GLASGOW CHAMBER OF COMMERCE In partnership with Urban Land Institute

Prof Greg Clark, Lead Author
Senior Fellow, Urban Land Institute (ULI) Europe and Visiting Professor, Strathclyde International Public Policy Institute, University of Strathclyde.

and

J. Alexander Maxwell, Rapporteur
Fulbright Scholar, Urban Design Studies Unit, University of Strathclyde.

Thanks to Jonathan Coutrier who provided research assistance on technology and urban development.

Sponsored by

BT IBM University of Glasgow University of Strathclyde Institute for Future Cities Made Brave

About Glasgow Chamber of Commerce

Glasgow Chamber of Commerce is a membership organisation with a membership of 1350 businesses from Glasgow and its wider metropolitan region.

It has served the business community in the city for over 230 years and offers a comprehensive range of services and products to help businesses achieve their potential, promote the broader business agenda of the city and drive forward the economy of Glasgow.

Glasgow Chamber offers a wide range of services including the provision of:

- Business Events and Networking
- Bespoke Project Activity
- Exporting and International Trade Support
- Policy and Stakeholder Management
- Training and Development Solutions

The Chamber also plays a crucial role in representing members' views at local, regional and national policy levels through affiliation with both the Scottish and British Chambers of Commerce.

As one of the largest Chambers in Scotland and as an accredited Chamber of Commerce, its work is regularly assessed by the British Chambers of Commerce to ensure that it is of the highest quality.

Winner: Scottish Chamber of Commerce of the Year 2014

About ULI

The mission of the Urban Land Institute is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide. ULI is committed to:

- Bringing together leaders from across the fields of real estate and land use policy to exchange best practices and serve community needs;
- Fostering collaboration within and beyond ULI's membership through mentoring, dialogue, and problem solving;
- Exploring issues of urbanisation, conservation, regeneration, land use, capital formation, and sustainable development;
- Advancing land use policies and design practices that respect the uniqueness of both the built and natural environment;
- Sharing knowledge through education, applied research, publishing and electronic media; and established in 1936, the institute today has more than 30,000 members worldwide, representing the entire spectrum of the land use and development disciplines.

ULI Foundation Annual Fund [1]

ULI Scotland (See Appendix) [1]

ULI relies heavily on the experience of its members. It is through member involvement and information resources that ULI has been able to set standards of excellence in development practice.

The Institute has long been recognised as one of the world's most respected and widely quoted sources of objective information on urban planning, growth, and development.

To download information on ULI reports, events and activities please visit www.uli-europe.org

Urban Land Institute
50 Liverpool Street
London EC2M 7PY
Tel: +44 (0)20 7487 9570
Email: ulieurope@uli.org

About Tomorrow's City Centre

Glasgow Chamber of Commerce and the Urban Land Institute wanted to consider how constantly evolving technologies would influence consumer behaviours and potentially impact the city centre experience in the next five years.

As a result, the 'Tomorrow's City Centre' Retreat and Conference was born.

The project comprised of the delivery of a 'Tomorrow's City Centre' Retreat and Conference both moderated by Greg Clark, Senior Fellow of ULI. [3]

Its aim was:

To consider how constantly evolving digital technologies will influence consumer behaviours and potentially impact the Glasgow city centre experience in the next five years

'City centre experience' includes retail, events, real estate, public services and attractions, night time economy, transport and city infrastructure including data management.

The project sought to capitalise on the work already being done in the city through the City Centre Strategy; the Future City Demonstrator funded by TSB and Future Cities project at Strathclyde University as well as galvanising links and intelligence through private sector partners with a fundamental role in city centre experience.

The project was in partnership with Glasgow Chamber of Commerce and ULI; sponsored by BT, IBM, University of Glasgow, University of Strathclyde and MadeBrave®.

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Executive Summary and Introduction

Rapidly evolving digital technologies are transforming retail, leisure, education, and public administration. The shift to digital platforms for transactions and networking provides a new set of pressures on land uses and the role of physical space. Such digital platforms change the way that space is used and have major implications for the built environment, especially the new and different uses of high streets, public realm, retail locations, corporate and public offices, and small business premises. The sectors most impacted by digital platforms are also those that are most strongly clustered in city centres. This means that city centres must adjust to these changes and discover new ways of using space that complement the digital world and are enhanced by it. Digital technologies are an opportunity for city centres if they are embraced positively and with imagination and flexibility. They are also a major threat and those city centres which fail to adapt could face stagnation.

In a city like Glasgow the changing methods of delivering retail and public services will mean that the use of the city centre will involve accelerated and continuous change.

At the same time fast evolving consumer and citizen preferences and behaviours mean that there are new opportunities for the city centre to develop its role as both a multi-functional destination, and also as a focus for digitised transactions, information, and incentives. Over the next five years Glasgow city centre must adjust to these changes and opportunities and develop a confident new approach. The Tomorrow's City Centre project was developed by Glasgow Chamber of Commerce in partnership with the Urban Land Institute (ULI).

The aim of the project was:

*To consider how constantly evolving digital technologies will influence consumer behaviours and potentially impact the Glasgow city centre experience in the next five years.**

The project involved the delivery of a Tomorrow's City Centre retreat and conference, which were held in Glasgow on October 9th and 10th, 2014. As an output of the project, this report was generated as a way of capturing key questions, challenges, and opportunities facing Glasgow city centre as one of tomorrow's city centres. Whilst much of the text and findings of this report are specific to Glasgow, many of the lessons are applicable to city centres throughout the world, as city centres begin to address the rapidly evolving digital landscape.

* 'City centre experience' includes retail, events, real estate, public services and attractions, night time economy, transport and city infrastructure including data management.

KEY FINDINGS

Glasgow city centre, as one of the world's tomorrow's city centres, should prioritise the following over the next five years:

- **Build upon and renew historical strengths** and traditions and develop ambitious visions for becoming a global leader in the digital age. Glasgow has a rich culture and history as a 'maker of things' that can be used to help establish itself as a forerunner in digital innovation. Glasgow city centre, unlike some other city centres, is a great gathering place, retail centre and employment hub and needs to leverage digital platforms to continue to be that.
- **Use and share data efficiently and effectively** to quickly respond to what people want from their city centre. Data should also be used to showcase how Glasgow's city centre 'stacks up' in comparison with other city centres in Scotland, the UK, and around the world. A data partnership was advocated by participants as a way to help shape how data is prioritised, used and shared.
- **Glasgow should strive to be a hyper connected city centre**. With evidence of smaller businesses in the city centre where good broadband speed is not yet available, Glasgow should ensure ubiquitous, high-quality wireless and broadband connectivity in order to drive productivity and innovation. It is important to reach those in the community who are marginalised and not digitally connected to the benefits of the city centre. Over 30% of Glasgow's population is not digitally connected.
- **Focus on putting people at the centre of digital strategy**. How digital systems can best serve people (as citizens, customers, entrepreneurs, workers, tourists, students, children, etc) and be customised to individual needs. Glasgow should be decisive about digital inclusion and think about how it builds its relationships with people. After all, 'people make Glasgow.'
- **Invest in smart car parking** that frees up the time spent in the car looking for parking. This will allow for more time enjoying city centre attractions and increase productivity.
- **Re-use urban spaces** in a way that allows for more artisan, incubator or pop-up business to experiment and become more entrepreneurial. Update and deregulate policies that restrict the ability of city centre businesses and spaces to adapt to real time changes in the demands from customers and citizens. This may require active adjustments in leases (e.g. 30 day rolling leases for vacant properties), planning, zoning, and business models of property owners.
- **Institutionalise a permanent 'Strategic City Centre Operations Group'** to respond to the needs of the City in real time, similar to the successful senior level Response Team formed during the Commonwealth Games in 2014 which prioritised issues and handled them.
- **Make the innovation economy in Glasgow City Centre more visible both to its citizens and potential 'innovation angels' and investors**. Better define the innovation districts in the city centre and their identity and location. Define which districts require more or less regulation.
- **Encourage more people to live in the city centre**. Glasgow could have a much larger city centre resident community. How can that be achieved and the need for better childcare in the city centre be resolved?
- **Define the circumstances needed to shift towards reduced car use**. Glaswegians enjoy driving to and from the city centre and the first task is to make that easier. But in the longer term can better transport solutions incentivise alternatives to car use?

"We need a proper digital roadmap... at the moment we have very patchy, very unfulfilling data... we want to know what the up and down experiences are so we can know where to invest in our city."

Stuart Patrick, *Chief Executive, Glasgow Chamber of Commerce*

"Digital is an enabler to make it easy to use the city centre."

Bill Kistler, *Co-Founder, Forum 48*

"You still cannot drink your coffee online... the experience is still in retail, but the convenience is now online."

Anne Ledgerwood, *General Manager St. Enoch Centre*

"The future of cities will be about choice, talent and quality of life at all income levels."

Maureen McAvey, *Senior Resident Fellow, Bucksbaum Family Chair for Retail, ULI*

Part 1. City Centres and Technology

Introduction: Cities, City Centres, Technology, and the Future

The use of technology, and in particular Information and Communication Technologies (ICTs), to optimise the efficiency of urban infrastructure and the delivery of public and commercial services has captured the imagination of policy makers and businesses. Cities are increasingly experimenting with technological solutions to their congestion, governance, pollution, social and economic problems. Some are optimising urban infrastructure to better control and respond to the flow of people, goods and traffic. Others want to improve the distribution of energy, water and the disposal of waste. The use of ICTs to engage citizens in decision making, acquire real-time feedback and user-generated data to improve city-management, is also becoming increasingly popular – and has potential benefits for the retail sector too. Some cities are using new technologies to deliver services such as health, safety and education, whether through instant diagnoses, improved public surveillance and policing, or remote and continuous learning. As a result, the application of these technologies has the potential to change the form, functions and liveability of city centres.

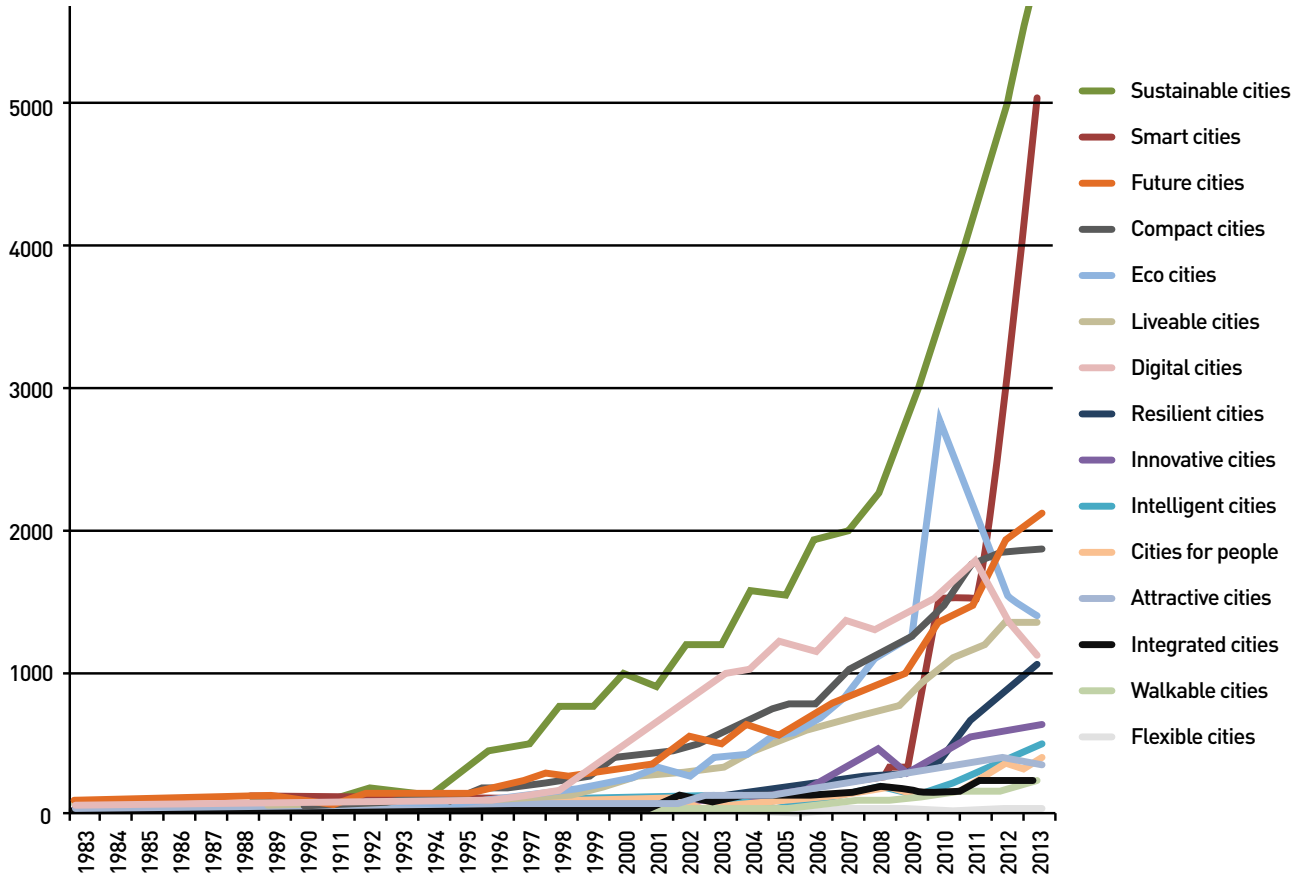

Fig 1. The language of smart and future cities. Source Clark, Moonen, Moir1

The use and combination of these systems comes under many names that have different meanings to different stakeholders, such as 'smart cities', 'future cities', 'intelligent cities', 'the internet of things'. Its promised impacts range from an anticipated global market worth €300 billion a year by 2020 and €600bn in savings for the public and private sector through greater efficiency. In addition, Arup, IBM and Siemens forecast a 15% reduction in emissions due to greater energy efficiency, reductions in congestion, improved public health and safety, greater civic participation in urban government and management, and more accessible education, care, entertainment and retail opportunities.

Many cities have already developed technological solutions to meet the challenges of urbanisation, however uptake of 'smart city' technologies has been slower than anticipated, and existing solutions have not yet matched expectations. Rio de Janiero, London, Glasgow, Philadelphia, Boston, Barcelona, Dar Es Salaam, Songdo, Masdar are but a few leading examples of cities experimenting with new technologies.

"We must understand what the needs are and have the technology speak to the needs... most cities in the UK don't have a chief technology/information officer."

***John Langford**, Director of Live Entertainment, Scottish Exhibition and Conference Centre*

However to date, no city has fully deployed an integrated technological grid covering all urban functions and services (Brookings, BIS, Arup). This partially stems from the reluctance of urban governments from undertaking costly projects with large initial outlays in times of austerity and limited fiscal autonomy, or value capture mechanisms. In addition, uncertain long-term returns and the accompanying political risk, or a lack of vision and leadership, which is sometimes delegated to the private sector have stifled innovation. Finally, the relative lack of 'first movers' from whom mistakes can be learnt means few cities are willing to take the plunge (ibid).

"If the city centre was a store you would be able to know what you were selling. If there was the right kind of data sharing, a picture of the trade of the city centre as a whole would become available. We must do all we can do to be at the forefront of digital cities. Can we make Glasgow a showcase for new technologies?"

***Kevin Kane**, Executive Director, Glasgow Economic Leadership Board.*

However, as urban centres experiment with different solutions and seek to host clusters of firms working on technological solutions to urban challenges, they can reap the economic benefits linked to the knowledge-economy, as well as exposure to evolving urban technologies.

2. Why do City Centres matter?

City centres are arguably the most complex and influential locations in the world. Their densities, complicated and over-lapping land-uses, and diverse ownership patterns make them hubs of activity and innovation, but also management and investment challenges. City centres are the core nodes of metropolitan investment markets and infrastructure platforms, and successful city centres can and do affect positive change at the regional and national levels. As more than half of the world's population now live in urban areas, effective investment in city centres is more important than ever.

Successful investment in city centres requires joint working between the public and private sectors and amongst multiple land owners. In an environment of constrained public sector funding, it becomes increasingly difficult for cities to invest in their centres. This is especially true in Europe where the historic nature of so many city centres provides a rich cultural endowment, but also a major re-investment challenge. Although the private sector is attracted to city centres' natural attributes, investors can be discouraged by preservation and conservation regulations, changes in leadership, confusion over public-private partnership structures, perceived national and city bureaucracy, and a lack of accessibility and accountability from the public sector.

The world's premier cities, however, have found a variety of ways to overcome these challenges through innovative investment and partnership models supported by leadership and vision. Europe's city centres are a key element of Europe's competitive advantage in an increasingly globalised world, where Europe's cities cannot easily match those in other continents for scale or power. Europe's historic DNA, its cultural and developmental treasures, are housed in the city centres of more than 100 cities. These city centres are magnets of tourism and leisure, and they also foster the creation of knowledge and the expansion of culture. However, Europe's city centres must not only perform the role of museums, they need to be active business and trade hubs, as well as centres of communication, administration and government. Therefore, continuous reinvestment is required in both infrastructure and in sites and land parcels. This requires both a common agenda for city centre investment and high calibre investment and development projects in individual locations.

3. Digital Technologies and City Centres

Almost all of the roles that city centres play in a modern city are impacted by digital technologies. City centres are:

- Places of employment
- Providers of public services
- Retail locations
- Business districts
- Entertainment hubs
- Administrative centres and clusters of Government
- Transport interchanges
- Seats of learning and knowledge
- Visitor destinations
- Locations of icons & memory, architecture, culture, identity, reputation and 'shrines'.

Increasingly city centres are also places where people want to live, and developing a resident base is an important driver for city centre success.

These functions can all be enabled and enhanced by digital technologies. The sectors most impacted by digital platforms are also those that are most strongly clustered in city centres. Rapidly evolving digital technologies are transforming retail, leisure, education, and public services/administration. But, this shift to digital platforms for transactions and networking provides a new set of pressures on land uses and the role of physical space because they change the way that land, infrastructures, buildings, and locations are used. They can reduce demand for certain activities in some locations, and they can provide opportunities for increased activities in other locations. Digital technologies also increase the pace of change as well as the speed of transactions in city centres. Digital platforms have major implications for the built environment, especially the new and different uses of high streets, public realm, retail locations, corporate and public offices, and small business premises. This means that city centres must adjust to these changes and discover new ways of using space that complement the digital world and are enhanced by it. The capacity of city centres to adjust quickly and continuously to digital technologies is primary in this process. How well city centres adapt also determines how much they can take advantage of opportunities associated with digital technologies.

4. What are the key technologies?

The Internet, Broadband and Wireless Networks

Underpinning the relationship between improved urban functionality and technology is the internet, in particular broadband and wireless networks. Cities seeking technological solutions to their challenges require a reliable broadband infrastructure which can both serve citizens and 'the internet of things' (IoT) and be available through wireless networks. Wireless networks are a critical means to establish connectivity and broadband is the current means to drive depth and speed into networks. The IoT represent all devices connected to the internet – whether because they are controlled remotely, need a connection to perform their functions, or because they generate data to be processed and stored. As more and more devices and users connect to the internet, cities must have sufficient bandwidth to process the resulting data flows. As more is connected to the internet the costs of exclusion from the internet rise and the digital divide can exacerbate other disadvantages.

Smart Infrastructure, Sensors, and Real Time Data

Smart infrastructure is capable of monitoring flows, events, moods and people in order to generate data or optimise its response. For instance, facial-recognition and crowd or traffic counting CCTV cameras, can track and manage the flows of goods and people and alert city authorities to issues such as criminal activity or traffic jams. For instance, CCTV cameras in Manchester are being used to learn the patterns associated with drunkenness and crime

in entertainment areas to help the police tailor its response. As such, they are often connected to centralised control-centres, where city-wide sensors at key infrastructure points generate real-time data on live situations. Rio de Janiero, for instance, has a control centre monitoring all of the city's infrastructure. All of the city's government departments are involved, ensuring an integrated analysis and response to events and crises. Barcelona is going even further by developing its own city-wide operating system. In the future, the idea is to use such infrastructure to provide real-time solutions to daily events, such as reactively injecting more buses and trains into service to respond to sudden surges in demand, as opposed to sticking to fixed service patterns.

"Take some data and go and do something. We are all still looking at data in the rear-view mirror"

***Andrew Sime**, Director, IBM Scotland*

Smart infrastructure can also respond automatically to situations, for instance by adjusting the timing of traffic lights or increasing public lighting when public safety is compromised, as is the case in Barcelona and soon in Glasgow. Other examples of smart infrastructure includes GPS trackers on public transport or delivery vehicles – such as UPS's ORION system which allows it to optimise the route of its vehicles on a daily basis, or the platooning technology being developed to automatically drive trucks in close formation to minimise their traffic impact.

Smart infrastructure which generates data – such as GPS, crowd-counting, or sentiment analysis software - opens the possibility of real-time or retrospective data-analysis that can be used to offer a holistic view on how cities function. Milton Keynes harbours such a centre that harvests data on all forms of transport across the UK and provides a daily sentiment analysis of passengers at London's major stations by using data from social-media. As a result, the data generated by smart infrastructure can be processed and published under the form of 'dashboards', giving near real-time updates on key city indicators as a form of continuous feedback, as is already the case in London.

E-Services, E-Government, E-Democracy and E-Commerce

The ability to access municipal services online is becoming a cornerstone of urban service delivery in many developed cities. It makes it easier for citizens to acquire information, submit feedback and perform necessary administrative tasks such as tax-payments. At the same time, it reduces operating costs for urban governments as they rely less on costly paper forms, one to one meetings and large public information campaigns to interact with citizens.

E-commerce has also become crucial to urban life. In the US alone it is worth $232bn a year, while it is expanding rapidly across emerging cities. E-commerce in Glasgow generates about £2.4billion GVA directly and £1.8billion indirectly and there are nearly 50,000 jobs directly supported by e-commerce and 36,000 indirectly. Time-pressed consumers no longer have to run to out of the way shops, as they can order and pay for goods and services with a short delivery span.

Smartphones, Telematics, and Cloud Computing

Smartphones have rapidly become a key component of 'smart cities' and city centres. A study by Ericsson found that their potential for generating user-feedback and facilitating daily transactions was greatly valued by urban residents. For instance, smartphones have made it easier to access e-commerce and municipal services on the go, move around the city and access transport, register feedback across social media or directly to city-hall as is already the case in Philadelphia and Salt Lake City through their 'textizen' programme. At the same time, geo-location and sentiment analysis software have made it easier to acquire real-time data on citizens' movements, moods and activities, through their smart phones which in turn feeds into the decision making process of policy makers and retailers. Other forms of communication, such as tablets, cloud storage and teleconferencing have also changed the way urban residents work and live. Employees

no longer need to be physically at the office to continue working – which in turn allows continuous connectivity both within and between cities since any location can be transformed into a workspace, given the right technology.

Telematics are also increasingly present in education and care. Their portable nature makes remote learning easier and allows friends and family members to monitor the health and well-being of their dependents at school or in hospital. However, the use of telematics for these purposes is still experimental and under-developed.

Smarter Resource Management, Energy Efficiency, and Smart Grids

A key impulse behind the technological upgrade of cities is greater energy efficiency in the face of climate change and increasing pollution. Cities are therefore experimenting with solutions to make buildings – the largest single consumer of energy – but also transport, water and electricity networks more efficient.

To this end, an increasing number of buildings are being retro-fitted with smart meters, smart-lighting and smart climate-control to tailor their energy consumption to the number of people present and ambient temperature. New buildings also tend to be built to these new energy efficient norms.

Pollution and energy inefficiency from transportation is being tackled through hybrid cars or e-highways. Los Angeles is experimenting with the latter by electrifying a portion of the highway leading freight trucks from its port terminals to distribution and railway centres. Other potential future solutions include driverless cars which can drive more efficiently and safely than humans. However, while the legal framework around these is rapidly being developed in countries such as the US, UK and Sweden, cities have proven reluctant to embrace them.

Renewable energy is also becoming a key urban technology. Cities such as Songdo in South Korea and Masdar in the UAE – both 'smart cities' built from scratch – rely on renewable energy sources, and in particular the re-cycling of waste. Songdo has an underground waste disposal system connected to every house which automatically collects and processes waste, and will soon convert it into energy – a more futuristic version of Vienna's own waste-to-energy scheme.

Finally, to maximise their resource use, many cities are becoming increasingly reliant on 'smart grids', whether for water or power, which respond to demand instead of distributing a fixed amount. Further, water grids will be able to detect leaks, while Siemens hopes that power grids will be able to adapt between different energy sources, switching from intra-city renewable sources when they produce a surplus, to the main grid in times of deficiency – while excess current gets stored in batteries.

5. City Centres Responding to the Digital Age

The application of technology to urban governance, infrastructure and day to day life is starting to have an impact how cities function. Although these are still early days for 'smart cities', and many projects and programmes remain relatively small scale, some promising trends are emerging.

City Responsiveness and Governance

The deployment of smart infrastructure, including monitoring centres in London, Glasgow, Rio de Janiero and Vienna, has already allowed a degree of improved responsiveness to urban 'events' such as traffic jams, accidents or criminal activity. While traffic management systems are still being adapted and upgraded, it is hoped that in the future smart urban transit networks will reduce congestion and maximise the functionality of public transport by adapting it to demand, as opposed to providing a fixed supply. Rio's control centre will have a chance to prove its value in co-ordinating urban management during the 2016 Olympics, just as the Glasgow Operating Centre did at the recent Commonwealth Games.

Similarly, the use of GPS systems and path-finding algorithms to learn the most efficient routes, and adapt them in case of traffic or accidents, has already cut costs for courier companies such as UPS. The money saved on fuel, reduced idling time and route optimisation not only reduces emissions and cuts traffic – it is also encouraging city authorities to apply similar technologies to public transport.

Responsiveness to crime, anticipation of, and adaptation to, social behaviour are also being facilitated by smart infrastructure. The impacts on crime prevention could be significant. For instance in Manchester, the police have used CCTV and crowd modelling to anticipate and control the flow of people in popular drinking areas. By pedestrianising particular zones, and using surveillance data to learn trends and adapt their tactics, they have reduced violent crime by a third in those areas. The roll-out of smart street lighting in Barcelona and Glasgow is anticipated to have similar effects.

User-generated data, and the data from smart infrastructure, will also have an impact on urban management. For instance, the information collected in Rio's control centre, or Milton Keynes Transport Systems Catapult centre, including vehicle and pedestrian habits and mood analytics, will feed back into policy-making for future urban planning. There are also expectations that such programmes could lead to real-time responses in the future. Social media is proving to be crucial in this respect. It reminds city authorities that urban technologies can generate a two-way conversation, with citizens not only as source of data, but also as active contributors to urban discussions. For instance, Coventry partnered with IBM to devise a crowd-sourcing feedback exercise through social media to inform their policy making. Leeds has since devised a similar programme, while in Dar es Salaam, the 'OpenStreetMap' app has facilitated a crowd-sourced mapping of the city to complement the paucity of official maps.

In Oslo, an app devised as a game allows children to highlight dangers on their walk to school to alert the city authorities to dangerous streets in need of attention. In short, city authorities will not only benefit from user-generated data but will also have to engage with the feedback generated through accessible smart-technologies. According to Ericsson and IBM, this is a crucial functionality of smartphones and social media, which can empower connected citizens to engage with their municipalities with greater ease than ever before, radically altering the dynamics of urban politics.

Furthermore, when the information from user-generated data, smart infrastructure and citizen feedback is combined, it will generate a holistic view of how cities function, providing an unparalleled level of data granularity for urban governments, granting them rich insights into how cities are lived in and used by citizens.

However, this is not without risk. As much of the information generated by users and smart infrastructure is accessible to the public as 'Open Data', it can also be used to generate 'public bads'. While we have not yet seen significant negative repercussions at this early stage, the Makkie Klauwe ('easy pickings') app is a cautionary tale. Developed in the Netherlands, it combines publicly available data on neighbourhood wealth, crime rates and other characteristics to tell criminals which are the ripest targets for burglary. Although devised as an awareness-raising tool that was never published, it underlines the risk of open data for city-safety. Furthermore, mass monitoring, sentiment analysis and citizen tracking also raises questions of data-safety, encryption and privacy.

Finally, the reliance on connectivity for day to day urban functionality underlines the question of the digital divide. There is a risk that emphasis on these new technologies excludes those who cannot afford or use them. Cities such as Chicago and Los Angeles are running programmes to reach the digitally marginalised, and disconnected businesses – but as digitisation expands, these programmes will have to upscale rapidly to keep up.

Liveability and City Centres

New technologies could also drive improvements in urban quality of life – whether through improved healthcare, reduction in pollution, or by facilitating access to education. In Manchester, scanners capable of delivering instant diagnoses for lung diseases are being developed. Ericsson predicts that smartphones could also be used to monitor elderly or young dependents in care and what treatment they are receiving – however these technologies are still in their infancy. In Los Angeles, the e-highways programme mentioned earlier has the potential to considerably reduce pollution in surrounding neighbourhoods, generating public health gains and reduced health expenditure. Similarly, efforts to improve the flow of traffic – whether smart traffic lights, smart route-finding or simply urban transit optimisation could reduce carbon emissions and decrease pollution.

"Think of the city as a service, as well as a place."

Dan Hill, Executive Director, Future Cities Catapult

In terms of education, telematics and smartphones could facilitate life-long learning. Their flexible nature and increasingly sophisticated options for interaction make learning packages more effective. However, the digital divide between the connected and the offline can create a quality-of-living divide. Programmes such as Tower Hamlet's 'Ideas Store' – which provides internet services to those who cannot access it in their daily life – will be crucial in equalising the gains of urban technology.

Changing Use of Space

The way residents, businesses and traffic use urban space is already being transformed by technology, and this trend will be accentuated as new solutions are rolled out. For instance, e-commerce has already changed urban retail environments. Some high-streets in the UK are stagnating in the face of convenient e-services such as Amazon. This is not only forcing retailers to adapt their services, but it also changes traffic patterns. Multiple individual car-trips to stores and shopping centres are being replaced by delivery vans, which represent a more effective way of transporting goods that gets individual drivers off the road. Similarly, as mass-transit expands and becomes more responsive and adaptable, its usage increases. Cities such as Vienna, for instance, already see up to 70% of its workforce commuting by public transport, bicycle or on foot – demonstrating that well-designed, smart transport systems can take drivers off the road. The use of smartphones to optimise route-finding could also contribute to this trend according to Ericsson.

Adapting smart technologies also changes the built environment. To upgrade transport networks in existing cities implies a massive retro-fitting of urban infrastructure. Similarly, upgrading old buildings to be more energy efficient implies a significant amount of investment. While this is feasible in smaller cities such as Barcelona and Vienna, Arup has pointed out that megacities such as New York cannot feasibly retro-fit their entire infrastructure given present fiscal and political constraints. This means that the deployment of 'smart technology' is likely to be fragmented in the near future, unless rolled out in entirely new cities such as Songdo or Masdar. That being said, the data generated by users going about their daily lives – such as geo-tracking and route planning – will help planners design future urban space around the information

generated by new technology, perhaps leading to more fluid and efficient urban forms.

New technologies are also changing work and living habits, making work from home or abroad much more feasible. Claims that cities will become irrelevant as places of convergence - once made at the apparition of the telephone, fax and internet have therefore resurfaced. This is highly unlikely: instead, the implication seems to be that work places are becoming less 'containers' of workers and more collaborative spaces – where employees go to meet and exchange ideas, not merely to work on their own. Proximity to ideas and the serendipity of human encounters will remain crucial, even though working space (and time) expands beyond the office. It is therefore likely that the city will become a broader space of encounter, where work and ideas are produced anywhere people meet – cafes, squares, parks, at home – and not just at work.

At the same time, city centre living is on the increase as part of the broader processes of re-urbanisation. A 30 year cycle of reducing urban blight and creating city centre amenities, coupled with the re-concentration of business and jobs in cities, and the growth of urban student populations and live entertainment have all contributed to the huge increase in city centre residents. An important positive crowd effect is created by those who live in cities, providing a combination of 'disposable income', 'safety in numbers', and clustered communities that enable the city centre to provide a wide range of public goods that are more difficult when resident numbers are small. Increasing city centre living also has other positive benefits: it reduces travel to work distance and energy use; it re-uses buildings and sites that may have become redundant or fallen vacant; and it underpins amenities that can also be enjoyed by non-residents.

Energy

New technologies could re-write the whole energy cycle in urban environments. Smart cities like Vienna, and (soon) Songdo in South Korea are already demonstrating the potential of waste-to-energy schemes to reduce carbon emissions and maximise the recycling of city-energy. Vienna's scheme, for instance, generates sufficient power for 50,000 homes, and sets the Austrian capital firmly on course to reach its 80% emissions reduction target by 2050 (based on 1990 levels). Furthermore, the potential of technologies such as smart buildings, batteries and smart grids highlighted by Siemens suggests that cities could generate energy surpluses in the future, with every building acting partially as its own generator. However, these technologies are still in their early stages, and their impacts are not yet fully appreciated.

Economic Gains

Cities do not have to undergo a full conversion to smart technologies to benefit from them: the economic gains of a strong tech sector are also valuable. Incubation groups such as Silicon Roundabout in London, 22@Barcelona or the tech ecosystem in New York generate substantial public revenue (up to $5.6bn in New York alone), large numbers of jobs (48,000 in East London in 2010 and 291,000 in New York), while benefiting from collaboration with their hosts as urban test beds. As a result, they provide them with experimental solutions, cheap roll-outs and productive self-reinforcing clusters that strengthen their economic diversity.

6. City Centres and the Future

Now that global urbanisation is the reported phenomenon of our time and the human race becomes a majority urban species for the first time, it is easy to forget that whilst major urban growth is taking place in the poorer developing countries, there is also a profound re-urbanisation underway in the developed world. This expresses itself as the new drive for city centre living, the re-locations of businesses into city centres, the trend-busting growth of urban brands and locations, the massive increase in allocations of investment capital to city centre real estate, and the substantial increases in urban tourism.

Digital technologies are part of these trends and they enable each of them in positive ways, offering the possibility that, rather than being seen in the future as the technologies that denuded city centres, this generation of apps, sensors, metres, clouds, and networks could well be seen as those that accelerated urban restructuring towards a new golden age of cities in the world's first urban century.

Part 2. Tomorrow's City Centre: Glasgow

1. The Tomorrow's City Centre Retreat and Conference

Glasgow was host to a two day retreat and conference on October 9th and 10th 2014, as part of the ULI/GCC 'Tomorrow's City Centre' project. The events brought together a diverse group of over 100 people from Glasgow and other cities across the UK and around the world [3]. Local and national government officials, industry representatives, leading urban scholars, and residents all voiced their observations and opinions about how digital technologies are influencing consumer behaviours and their potential impact on the Glasgow city centre experience in the future.

Many of the key challenges and opportunities facing tomorrow's Glasgow city centre are captured in this part of the report. While many of the insights and findings are specific to Glasgow, this section also highlights several potential solutions proposed by a diverse, international group of keynote speakers and panel members. The hope is that many of these lessons may be applicable to other city centres throughout the world, as they begin to address the rapidly evolving digital landscape and move beyond the cities that they are today.

2. Glasgow Today

"Glasgow is the 'real' capital of Scotland."

Bailie Elizabeth Cameron, Executive Member for Economic Development, Glasgow City Council

Glasgow is a world class city with a global reputation as 'one of the world's friendliest cities' (Rough Guides, 2014). The city has emerged as Scotland's commercial, industrial, cultural and knowledge capital, recently receiving international attention as host to the 2014 Commonwealth Games – hailed by Commonwealth Games Federation President, Prince Imran as, 'the best Games ever.' Not only has Glasgow had a truly amazing year, but as Bailie Elizabeth Cameron emphasised in her opening remarks during the conference, Glasgow is a smart and innovative city with a bright future.

Quick facts about Glasgow city centre (Cameron, 2014):

- Home to **150,000 jobs**, attracting 3,198 new jobs in 2013/14 alone
- **Largest student population in Scotland**, leading to a highly skilled labour pool
- **2.2 million visitors** each year, generating £500 million of revenue
- **UK's #2 retail destination**, outside of London's West End
- **Home to BBC Scotland and STV**, in addition to hosting several feature film productions
- **500 conferences/events confirmed** until 2024

Glasgow City Centre Strategy

The vision: Glasgow City Centre, as Scotland's commercial and cultural hub, will build on its distinct assets and unique features to become the most innovative and progressive city centre in Europe. Glasgow City will provide an excellent and sustainable quality of life and experience for citizens, visitors and investors that will drive growth in employment, population and shared prosperity.

To achieve the shared vision, stakeholders will collaborate on six core objectives.

To maintain position as the best destination to shop and play outside London

- To be the most prominent Scottish leisure tourism and business tourism destination
- To be the biggest job generator in Scotland
- To leverage the existing strong concentration of Higher and Further education
- To grow the residential population ensuring an adequate level of supporting infrastructure
- To remain a top ten investment location in Europe

Other related initiatives include, Digital Glasgow Roadmap and Open Glasgow [2]

Further information on Glasgow City Centre Strategy [2]

Glasgow is an innovative city

Since 2011 there have been over £8 billion of investments in the city across all sectors (Cameron, 2014). Glasgow has been innovative in securing funding to support significant improvements to infrastructure and job growth. In August 2014, Glasgow signed the City Deal for over £1 billion with the UK and Scottish governments to pay for major transport and employment programmes (BBC, 2014). The Glasgow City Council also recently developed a tax incremental financing (TIF) scheme for the Buchanan Quarter to unlock over £300 million in private investments and create jobs in the city centre (Scottish Government, 2012).

Glasgow has also focused its attention on bringing in more development and foreign investment into the city centre. Glasgow city centre will have three Grade A speculative developments (around 500,000 square feet) by Spring 2015 (Cameron, 2014) and was recently nominated fDi Magazine's Large European City of the Future for foreign direct investment strategy 2014/15 (fDi, 2014).

Glasgow is a 'smart' city

In addition to being an innovative city, Glasgow is also a 'smart' city. In 2013, Glasgow was selected from amongst 29 cities as the UK's TSB Future Cities Demonstrator in order to demonstrate how using technology could make life in the city smarter, safer and more sustainable (Future City Glasgow, 2013). Glasgow is already the first Scottish city to deliver free, 24-7 public access Wi-Fi outdoors (Glasgow City Council, 2014b), and the Glasgow City Council recently developed the City Centre Strategy 2014-2019 and Digital Glasgow Roadmap, which aim to ensure Glasgow remains as one of the best city centres in Europe and places Glasgow as a world-leading digital city by 2017 (Glasgow City Council, 2014a, 2014c).

Glasgow leading the way

As evidenced in this report and recent events, Glasgow looks to continue its legacy as a smart, innovative, and world-leading digital city. However, like other cities leading the way in experimenting with new technologies mentioned above (e.g. Rio de Janiero, London, Boston, Barcelona, Dar es Salaam, Songdo and Masdar), Glasgow is only starting to address the challenges brought on as a result of emerging digital technologies. Making these issues known, identifying opportunities and proposing potential solutions is the first step in setting a course for the future.

3. Challenges & Opportunities For Glasgow:
Tomorrow's Digital City Centre

The majority of participants polled during the retreat and conference agreed that Glasgow city centre has performed well over the past ten years compared to other city centres. The city centre's retail and entertainment offerings, range of locations and destinations, universities and links with the rest of the city were seen as vital strengths to keeping it the primary economic hub of the city in the age of internet retail and changing consumer habits. However, most also agree that Glasgow city centre is only somewhat prepared for the challenges of the future and that digitisation is already having an impact on Glasgow city centre, challenging its core role, forcing it to innovate and attract more people. [5]

Key Concerns and Challenges

When asked about why Glasgow should be concerned with the future of the city centre, participants at both the retreat and conference stated that businesses and jobs, sense of identity and pressure to adjust were amongst their key concerns. Coupled with this, competition from other locations, quality of public realm, connectivity, and loss of retail were identified as some of the primary challenges facing Glasgow city centre today. In order to become tomorrow's leading digital city centre, Glasgow will need to address a range of concerns and challenges. [5]

As digital technologies begin to free up space within the city centre previously occupied by brick-and-mortar retail and other uses, there will be an increasing need for adaptive reuse of spaces. As one participant warned, "Glasgow should expect to see nearly half of all its retail gone in the near future." This concern raises questions about the potential impacts of these changes on the physical form and function of the city centre. Most attendees agreed that Glasgow city centre needed to become more attractive and inviting, more efficient and adapt more quickly. [5]

"Should the number of licences in the city centre be restricted in order to make the city centre a more diverse and a more desirable place?"

Ryan James, Chairman, Glasgow Restaurant Association

Current patterns of land and property ownership – where land is in the hands of a few – will need to be addressed along with long-term leasing structures in order to allow for greater adaptation. Failure of policies to keep pace with changing business models will reduce the ability of the city centre to adjust over time to changing needs and demands, leaving buildings vacant and out of use. Glasgow city centre needs property owners to behave differently and to allow for easier and faster changes to regulation and planning applications. Digital services like AirBnB are already here, demonstrating that alternative solutions work.

Compared to other cities its size (Manchester for example), Glasgow has far fewer people living in its city centre, raising concerns over the quality of its public realm and suitability as a place for people to live. Getting more residents into the city centre is an economic challenge, as the cost of living in the city centre is relatively high. However, vacant buildings (also mentioned above) could be used to help diversify the housing market and make it more attractive for people to live in the city centre.

Additionally, several new districts have emerged in Glasgow city centre; however, they are not fully integrated. As one participant stated, "Many do not even consider the International Financial Services District as being part of the city centre... What really is the city centre?" This calls for greater connectivity and spatial integration in order to improve both efficiency and sense of identity.

"Allow lots of smaller players in... create more diversity and different uses of the city centre."

Richard Bellingham, Director, Institute for Future Cities, University of Glasgow

Like spatial integration, concerns were also raised over the need for more social integration between Glasgow city centre and the rest of the city. The city centre is still viewed as a central place for people-to-people and people-to-business interactions. These types of interactions should be encouraged in the city centre as a 'third' place (Oldenburg, 1989), separate from the home or workplace, where the city centre could continue its role as an anchor of the urban community and foster greater, more creative interaction.

However, the benefits of the city centre as a hub for social interaction and economic activity should be felt by all members of the community. According to Susan Deighan, Chief Operating Officer of Glasgow Life, over 30% of people in Glasgow currently lack easy access to digital resources, creating a need to prioritise fairness or risk widening the digital divide. Digital inclusion is important, but it is also the symptom of a larger problem, requiring additional investment in education and better training programmes.

Likewise there is also a concern over demographic shifts and how to address an ageing population. Older populations still prefer a more analogue experience and may risk exclusion with the rise of digital technologies. The city centre of the future must recognise the individual and be able to accommodate all types of users.

Lastly, Glasgow city centre is the largest employment centre in Scotland. This means Glasgow city centre is of regional and national importance, and of particular concern in considering its vulnerabilities and the need to adapt in the face of digitisation. With a loss of traditional bricks-and-mortar retail in the city centre, there will need to be a plan for encouraging more of a knowledge economy that can cater to the challenges brought on by digitisation and keep the city competitive.

Opportunities

With these concerns and challenges come opportunities – opportunities to retain quality products and services and become a leader in the age of a 24-7, hyper-connected consumer culture. The general consensus from the Tomorrow's Future City Centre events was that the city centre should be viewed as a place where the digital experience is enhanced and complements the physical environment.

Using digital technologies in the city centre, Glasgow can seize the opportunity to enhance consumer experiences by increasing available information, better data collection and analysis, and encouraging networking and crowdsourcing. Likewise, the city centre can use digital technologies and data analytics to more effectively monitor and manage the city. Increased access and understanding of data can allow for greater prioritising of investments in amenities and services, more efficient planning and timing of services, the ability to see and solve problems (e.g. crime hot spots and traffic congestion), and improved integration of services. Conference and retreat participants championed the need for seamless digital connectivity and to create a digital contract that would allow greater data sharing. The shift is moving towards greater use of predictive technologies and data, rather than "looking at data in the rear-view mirror."

Additionally, advanced digital technologies can also be used to address the parking issue in city centre through 'smart' parking. It is widely recognised that the most successful city centres (e.g. Copenhagen, Helsinki) are those where there is a high level of city centre living and reduced car ownership. However, the proportion of people walking, cycling or taking public transport to work in Scotland has remained relatively unchanged at 30% over the past decade, and cars are still the main mode of travel, with two thirds of people traveling to work in their cars (Scottish Government, 2013). People want the flexibility to use their cars. Glasgow could look to other city centres implementing smart parking technologies like pay-and-walk services and parking spot finder apps to make the city centre more attractive to those who prefer to travel by car.

Glasgow also has the opportunity to leverage its human capital and academic strengths to build a stronger knowledge economy. Embracing younger generations and improving retention of graduates will be key. However, part of doing so is being able to make the city centre attractive and affordable (as mentioned above) and also recognising the changes in the modern workplace and being able to adapt spaces to meet the needs of a more mobile workforce (see box below).

Understanding the 3 "D's" Driving the Future of Work

Summary of comments by BT Customer Experience Futurologist, Nicola Millard

Diversity in the workforce. By 2020, there will be five generations in the workforce, each with different ideas about use of technology at work. Younger generations tend to be a 'chat' generation utilising apps like Facebook and Twitter, while older generations often prefer to digitally communicate by email. City centre businesses will need to not only adjust for these preferences in the use of digital technologies, but also accommodate a diverse workforce where people will be working slightly later in life but are not necessarily going to be healthier.

Death of the office cubicle. The workforce is becoming increasingly untethered by the options to work wherever they want. This raises the question, "What is an office for now?" Contemporary office concepts like the one used at Interpolis, one of the largest insurance companies in the Netherlands, show that more flexible offices spaces and schemes can lead to greater success. Likewise 'coffices' – places where there is good coffee, food, connectivity and 'buzz' (e.g. Starbucks, co-working spaces) are another alternative that could be encouraged in the adaptive reuse of urban spaces.

Droids. Is it likely that robots going to take our jobs? The answer is no and that many manual jobs are still quite difficult. Therefore, both skilled jobs and knowledge jobs are going to co-exist in the city centres of tomorrow. However, with increasing competition from cities in India and China, there is a need to improve the local knowledge pool as a way to build a stronger knowledge economy and stay competitive. City centres need to create jobs and not just automate them. Digital technologies are a great way to create jobs. As new technology comes along, new jobs will come along as well. Glasgow city centre will need to become more 'theatrically fluid' in order to attract people with these types of jobs.

4. Potential Solutions for Tomorrow's City Centre

During the course of the retreat and conference there were several keynote presentations and panel discussions where participants voiced their experiences and tested solutions for addressing some of the issues they faced as a result of digitisation. Below are brief summaries of several of these solutions.

Adjusting to the Digital Age: How omni-channel retailers can respond, succeed and be city centre champions

The current reality is that the digital experience is similar to what was once experienced in terms of service years ago in bricks-and-mortar shops. However recent changes like the advent of online retailers (e.g. Amazon), changes in technologies (e.g. smartphones and apps), and price comparison sites (e.g. Groupon) are forcing traditional retailers to adjust or risk dying off (e.g. Woolworths and Blockbuster).

However, the online experience is still not as personal as the retail shops of the 1950s. This is where the real opportunity lies for city centre retailers to offer catered services through more omni-channel or 'phygital' approaches, which combine the convenience and strengths of the digital with the personalised, in-person experience.

The omni-channel approach and seamless connectivity have been key strategies in the ability of traditional retailers to adjust to a more digital consumer. Historically people walked to the shop and picked up what they needed. Now, consumers are researching products and services beforehand, going to the shop and seeing the item in person, and then buying it online. City centre retailers need to think about omni-channel approaches in order to guide the complex customer journeys between the digital and physical worlds and attract customers by creating value-added services (e.g. Boots in-store personal services), which turn shops into destinations.

The economics of converting shop customers to be omni-channel remain compelling, as online only enhances the experience on the high street. Yet, the challenges retailers are facing are significant: online retail is growing and the costs are disproportionally higher for online orders. Though shops may start to look differently and not be as numerous, they will still remain an essential part of the city centres of the future. It is up to city centres to consider how best to retain local retailers and attract investment.

Tips for the future: What modern retailers expect out of tomorrow's city centre in order to invest

Summary of Comments by Simon Russell (John Lewis) and Danny Bagge (IBM)

- Have a 'pull' and be differentiated by various shopping and leisure activities that are seamlessly integrated, linking retail with non-retail, physical with digital, through an attractive, customised, and personal experience
- Provide excellent access to both public transportation (with extended hours) and adequate car parking
- Ensure the public realm is of a high quality and safe
- Offer a skilled workforce, trained in the use of new digital technologies

There are very few examples in the UK of city centres that are able to deliver these key elements. This is a potential opportunity for Glasgow city centre to be the leader in the UK as a digital-friendly city centre.

"There is a huge amount of insight and benefit to all contributors in allowing existing data to be consolidated and shared. Whether in the form of citywide or street footfall trends or more qualitative insight on shoppers channel behaviour."

***Dr Iain MacRitchie**, Chairman & CEO of MCR Holdings; Chairman & Founder MCR Pathway. Fellow of the Institute for Turnaround and Transformation Glasgow Life*

5. International examples of tomorrow's city centres

Glasgow city centre can also look to several international examples to begin answering key questions and concerns in the future.

- **BrickStarter (Helsinki, Finland)**. Brickstarter is a new model for how to make shared decisions about the use of vacant or under-used public spaces (Boyer & Hill, 2013). Building on the success of Kickstarter, Brickstarter is a prototype web service that provides a shared platform for citizens to suggest and build potential projects. It uses social media to increase citizen engagement in sustainable developments of their local community and crowd-funding approaches to identify new sources of capital to support projects.
- **Parklets (San Francisco, USA)**. Parklets convert utilitarian and underused spaces (i.e. wide streets and public right-of-ways) into temporary parks and public spaces through the city of San Francisco (San Francisco Planning Department, 2013). The model has been replicated in several other cities throughout the world to help make local communities more attractive to people.
- **Bottegas (Florence, Italy)**. Bottegas are a style of building where the workshop is in the back and the shop is in the front, facing the street. This building form can be adapted to different uses and be used to promote local skills and jobs.
- **Renew Newcastle (Newcastle, Australia)**. Renew Newcastle is a not-for-profit company that uses a creative leasing scheme to allow for more pop-up businesses in vacant properties (Renew Newcastle, 2011). The scheme finds short and medium term uses for buildings in Newcastle's central business district that are vacant, disused or waiting to be redeveloped. This scheme has helped attract people to the Central Business District (CBD) and bring life back into the centre of the city.

6. Proven local business solutions for dealing with digitisation

Be clever about the use of social media. Local businesses are lagging behind when it comes to the use of social media. Businesses must tweet several times per hour just to be effective. Investing in social media and using clever artificial intelligence (AI) to direct tweets are essential for businesses to engage with their online audiences.

We could have an intelligent app that offered suggestions for what to do next: 'You have just finished shopping in Buchanan Street, what do you want to do now? Do you want to shop more or do you want to do something cultural?"

Susan Deighan, Chief Operating Officer, Glasgow Life

Use near-field technology to produce heat maps and geo-location information that can indicate where people naturally gather throughout the course of a day or event. This information can then be used to make strategic investments and better understand consumer trends, as is being explored in Glasgow's new SSE-Hydro stadium.

Provide services or technologies that allow for cashless purchasing. This increases the convenience for customers and the amount of useful data collected for businesses. This can be done through providing online apps or digital wristbands, as is done in several venues throughout Glasgow.

Invest in mobile apps that will be of value to both the provider and the consumer. The aims should not be to flood the consumer with apps, rather focus on providing only as many as you need and making them easy to use, useful and reliable.

7. Conclusions

When asked what kind of city centre they wanted Glasgow to be, event participants answered: a 24-hour place where people work, rest and play; a hub for business; and place of culture and celebration.

Glasgow city centre, as one of the world's tomorrow's city centres', should prioritise the following over the next five years to adjust to rapidly evolving digital technologies, seize potential opportunities, and develop a confident approach for the future:

- **Build upon and renew historical strengths** and traditions and develop ambitious visions for becoming a global leader in the digital age. Glasgow has a rich culture and history as a 'maker of things' that can be used to help establish itself as a forerunner in digital innovation. Glasgow city centre, unlike some other city centres, is a great gathering place, retail centre and employment hub and needs to leverage digital platforms to continue to be that.
- **Use and share data efficiently and effectively** to quickly respond to what people want from their city centre. Data should also be used to showcase how Glasgow's city centre 'stacks up' in comparison with other city centres in Scotland, the UK, and around the world. A data partnership was advocated by participants as a way to help shape how data is prioritised, used and shared.
- **Glasgow should strive to be a hyper connected city centre**. With evidence of smaller businesses in the city centre where good broadband speed is not yet available, Glasgow should ensure ubiquitous, high-quality wireless and broadband connectivity in order to drive productivity and innovation. It is important to reach those in the community who are marginalised and not digitally connected to the benefits of the city centre. Over 30% of Glasgow's population is not digitally connected.
- **Focus on putting people at the centre of digital strategy**. How digital systems can best serve people (as citizens, customers, entrepreneurs, workers, tourists, students, children, etc) and be customised to individual needs. Glasgow should be decisive about digital inclusion and think about how it builds its relationships with people. After all, 'people make Glasgow.'
- **Invest in smart car parking** that frees up the time spent in the car looking for parking. This will allow for more time enjoying city centre attractions and increase productivity.
- **Re-use urban spaces** in a way that allows for more artisan, incubator or pop-up business to experiment and become more entrepreneurial. Update and deregulate policies that restrict the ability of city centre businesses and spaces to adapt to real time changes in the demands from customers and citizens. This may require active adjustments in leases (e.g. 30 day rolling leases for vacant properties), planning, zoning, and business models of property owners.
- **Institutionalise a permanent 'Strategic City Centre Operations Group'** to respond to the needs of the City in real time, similar to the successful senior level Response Team formed during the Commonwealth Games in 2014 who prioritised issues and handled them.
- **Make the innovation economy in Glasgow City Centre more visible both to its citizens and potential 'innovation angels' and investors**. Better define the innovation districts in the city centre and their identity and location. Define which districts require more or less regulation.
- **Encourage more people to live in the city centre**. Glasgow could have a much larger city centre resident community. How can that be achieved and the need for better childcare in the city centre be resolved?
- **Define the circumstances needed to shift towards reduced car use**. Glaswegians enjoy driving to and from the city centre and the first task is to make that easier. But in the longer term can better transport solutions incentivise alternatives to car use?

Appendices

Appendix 1

The **ULI Foundation Annual Fund** provides funding for Urban Innovation Grants, which support ULI District Council and National Council projects that recognise or launch innovative public/private partnerships and advance ULI's mission worldwide.

ULI Scotland is one of ULI's newest committees and has been developed to bring together professionals from across the real estate sectors, provide leadership in the responsible use of land, and create and sustain thriving communities. Through the exchange of information and the sharing of best practices, the Scottish Council offers industry leaders unique opportunities to further ULI's mission focused around specific industry specialisms. Meetings take place in a confidential and friendly environment, allowing members to share ideas, opinions and information that they might not be able to discuss elsewhere.

The Scotland Committee is led by Michael Henderson, Partner, Shepherd and Wedderburn with support from members and the wider membership. The current programme is in development and is aimed at developing a programme of quarterly meetings, study tours (local or international), case study visits, research, public forums and single day events.

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Appendix 2

URLS

Glasgow Chamber of Commerce:
http://www.glasgowchamberofcommerce.com

Glasgow City Centre Strategy:
http://www.glasgow.gov.uk/CHttpHandler.ashx?id=17548&p=0

Digital Glasgow Roadmap:
http://www.glasgow.gov.uk/CHttpHandler.ashx?id=18230&p=0

Open Glasgow:
http://open.glasgow.gov.uk/open-glasgow/

Appendix 3

Tomorrow's City Centre Retreat

The first day involved a closed panel based Tomorrow's City Centre Retreat in the Blythswood Hotel in the city with a closed audience of circa 20 participants to scope scenarios around 6-10 issues affecting the future of the City Centre.

This included the circa 10 cross-discipline contributors, a select few city stakeholders, a moderator and scribe who oversaw data sharing and active recording during the discussions. The participants brought their own experience, perspective and data to discuss the agreed range of issues or questions affecting and influencing the core project aim.

Issues for Debate

- What are the emerging digital technology developments that will impact positively or negatively on the city centre experience and how will they work?
- How technology infrastructure/connectivity is required to enhance the consumer experience of the city centre and what are the investment requirements?
- What are the opportunities in using digital technologies and data analytics to more effectively monitor and manage the city centre to enhance the experience?
- What are the potential impacts of these changes on the physical form and function of the city centre and the perception of the city centre and how does this need to be influenced?
- Overall, how do city centres remain relevant with the growth of online fulfilment, localised entertainment, and e-government?

Contributors

David Anderson	(Head of Planning & Design, Transport Scotland)
Richard Bellingham	(Director of Future Cities, Strathclyde University)
Greg Clark	(Senior Fellow, ULI) Moderator
Robert De Jong	(ULI UK Project Manager)
Susan Deighan	(COO, Glasgow Life)
Brian Fulton	(Chair, BID / Director, Holdfast Entertainment)
Mark Harrop	(Group Strategy Director for Devices, Mobility and Innovation, Lead for Cities, BT)
Dan Hill	(Executive Director, Future Cities Catapult)
Ryan James	(Chair of Glasgow Restaurant Association, Owner of Two Fat Ladies)
Kevin Kane	(Executive Director, Glasgow Economic Leadership Board)
Gordon Kennedy	(GCoC Strategic Advisor/Board Member, Digital Glasgow)
Bill Kistler	(ULI UK Executive Committee, Managing Partner, Forum 48)
Jane Laiolo	(Group Manager, City Centre Regeneration, GCC)
John Langford	(Director Live Entertainment, SECC & SSE Hydro)
Anne Ledgerwood	(General Manager, St. Enoch Centre/Chair of City Centre Retailers' Association)
Dr Iain MacRitchie	(Exec Chair MCR Holdings/ Multiple PE backed cos in Retail, Consumer, Business Services, Technology and Healthcare & Former Chairman of Hobbs)
Alison McRae	(Projects Director, Glasgow Chamber of Commerce)
Maureen McAvey	(Senior Resident Fellow, ULI)
Stuart Patrick	(CEO, Glasgow Chamber of Commerce)
David Ross	(Managing Partner, Dram Communications)
Andrew Sime	(Director, IBM Scotland)

Appendix 4

Tomorrow's City Centre Conference Agenda and Speakers

0830	Breakfast and networking
0900	Introduction from **Alison McRae**, Projects Director, Glasgow Chamber of Commerce
0905	Welcome Address from **Baillie Liz Cameron** 'Glasgow, a City Centre with a Future'
0920	Keynote speaker: **Simon Russell**, Director, Retail Operations, John Lewis Partnership 'Adjusting to the Digital Age: how can city centres respond and succeed? The view from John Lewis' Questions and discussions with Simon Russell
0945	Summary Points from the Tomorrow's City Centre Retreat: **Greg Clark**, Senior Fellow, Urban Land Institute
0950	Keynote speaker: **Danny Bagge**, UKI Digital Front Office Lead, IBM 'How can omni-channel retailers also be city centre champions?'
1010	Panel 1: Panel discussion: Issues and priorities for business: building upon the retreat feedback • **Danny Bagge**, UK Digital Front Office Lead, IBM • **Stuart Patrick**, CEO, Glasgow Chamber of Commerce • **John Langford**, Director Live Entertainment, SECC & SSE Hydro • **Susan Deighan**, Chief Operating Officer, Glasgow Life • **Ryan James**, Chairman, Glasgow Restaurant Association, Owner, Two Fat Ladies This panel will debate the impact on city centre businesses of digital acceleration and consider how businesses can best respond. Includes debate about what the priorities and strategy for Glasgow City Centre should be and questions and discussion with delegates.
1040	Voting on key issues raised
1050	Coffee, exhibition area and networking
1120	Keynote Speaker: **Nicola Millard**, Customer Experience Futurologist, BT 'How can we achieve a rich customer experience in a destination?'
1130	Panel 2: The place makers: how can the city centre respond to new digital platforms: how can it use them to attract business, visitors, and residents? • **Nicola Millard**, Customer Experience Futurologist, BT • **Peter Louden**, COO, Doddle • **David Anderson**, Head of Planning and Design, Major Infrastructure Projects, Transport Scotland • **Anne Ledgerwood**, Chair, City Centre Retailers' Association, General Manager, St. Enoch Centre
	Includes debate and questions and discussion with delegates.
1200	Voting on key issues raised

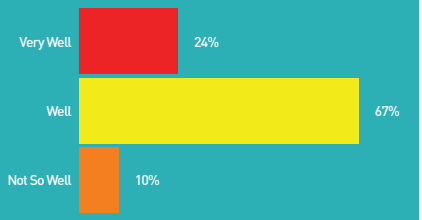
1210	Ask the Futurists. What works in the future? Keynote Speaker: **Richard Bellingham**, Director, Institute for Future Cities, Strathclyde University *'How can we use big data and new digital knowledge systems to create great city centres in the future?'* Keynote Speaker: **Maureen McAvey**, Senior Resident Fellow, Urban Land Institute 'Reflections from US cities and next generation insights about successful features of future city centres' Keynote Speaker: **Dan Hill**, Executive Director, Future Cities Catapult 'In smart city centres what can the UK learn from and offer to international communities?'
1240	Panel 3: Ask the futurists. What works in the future? This panel debate will look at the future and at international experience asking how can Glasgow both take a lead and also learn from experience around the world. • **Richard Bellingham**, Director, Institute for Future Cities, Strathclyde University • **Dan Hill**, Executive Director, Future Cities Catapult • **Maureen McAvey**, Senior Resident Fellow, Urban Land Institute
	Includes debate and questions and discussion with delegates.
1305	Summary and final vote by **Greg Clark**
1315	Networking, Exhibition and Refreshments

Appendix 5

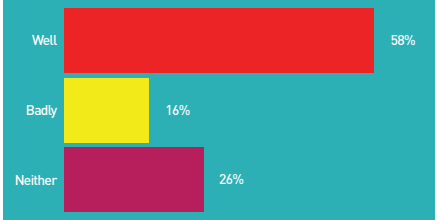
Voting Results

Voting Session 1
1pm Thursday

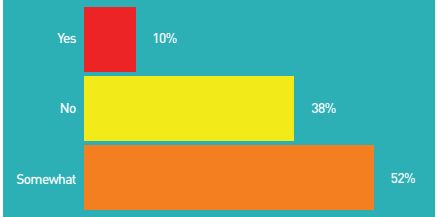
1. Over the past 10 years how well has Glasgow City Centre performed?



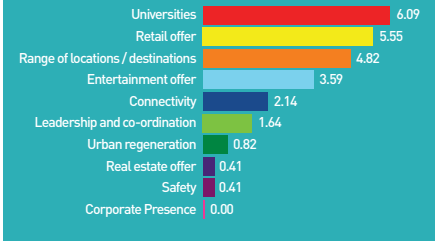
2. Relative to other city centres you know, has Glasgow City Centre adjusted?



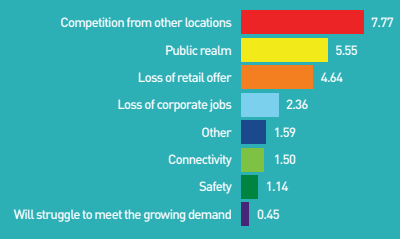
3. Looking forward is Glasgow City Centre ready for the challenges of the future?



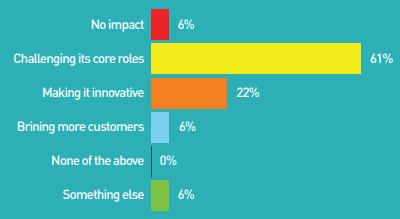
4. What do you see as the main strengths of Glasgow City Centre today?



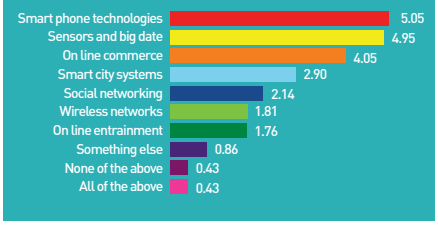
5. What are the main challenges that you see Glasgow City Centre facing?



6. What impact is digitisation having on Glasgow City Centre already?

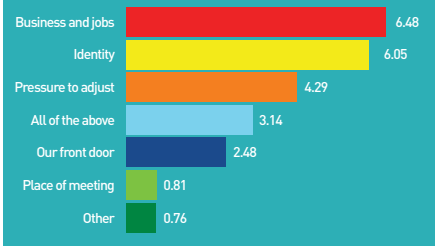


7. What are the emerging digital technology developments that will most impact positively or negatively on the Glasgow City Centre experience?

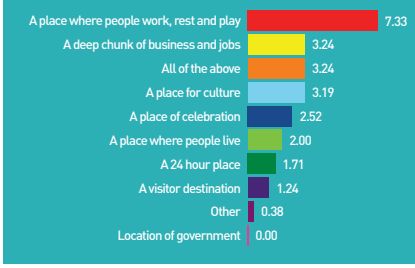


Voting Session 2
6pm Thursday

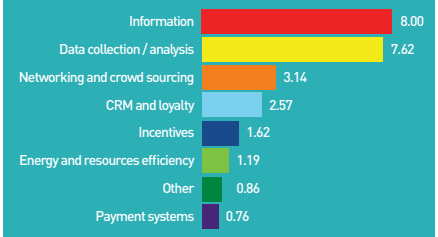
8. Why are we concerned with the future of the city centre?



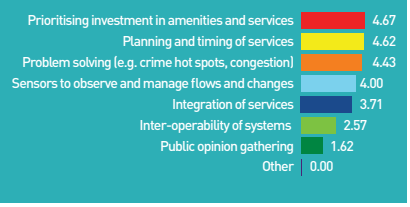
9. What kind of city centre do you want?



10. How can technology best enhance the consumer experience of the city centre?

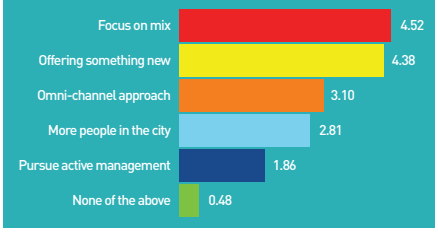


11. What are the chief opportunities in using digital technologies and data analytics to more effectively monitor and manage the city centre to enhance the management of the city centre?



12. What are the potential impacts of these changes on the physical form and function of the city centre and the perception of the city centre and how does this need to be influenced?

13. Overall, how do city centres remain relevant with the growth of online fulfilment, localised entertainment and e-government?

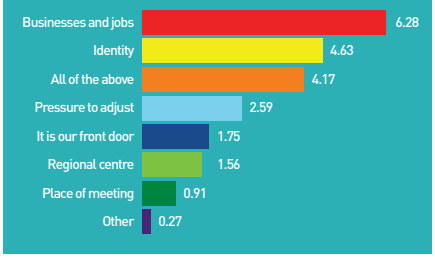


Appendix 5 (continued)

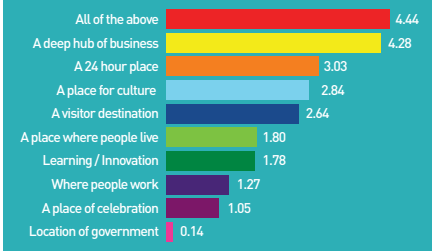
Voting Results

Voting Session 3
9:15am Friday

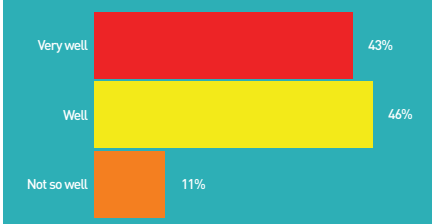
1. Why are we concerned with the future of the city centre?



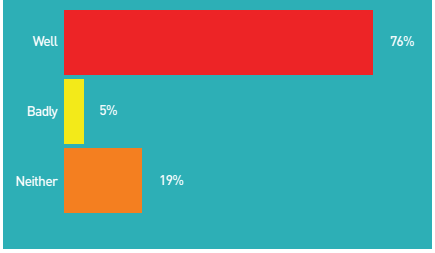
2. What kind of city centre do you want?



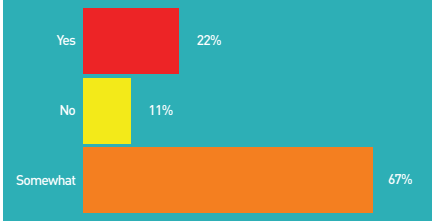
3. Over the past 10 years how well has Glasgow City Centre performed?



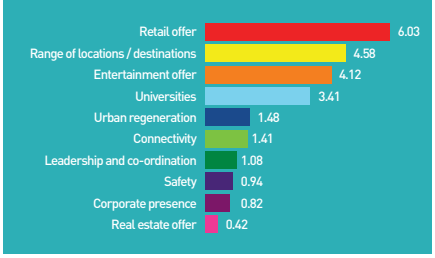
4. Relative to other city centres you know has Glasgow City Centre adjusted?



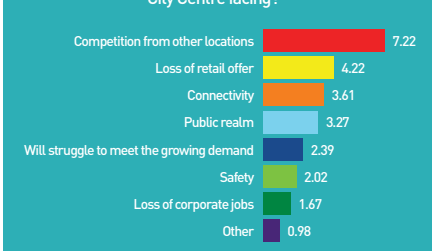
5. Looking forward, is Glasgow City Centre ready for the challenges of the future?



6. What do you see as the main strengths of Glasgow City Centre today?



7. What are the main challenges that you see Glasgow City Centre facing?



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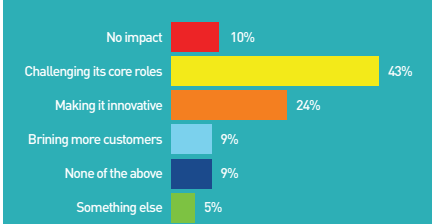
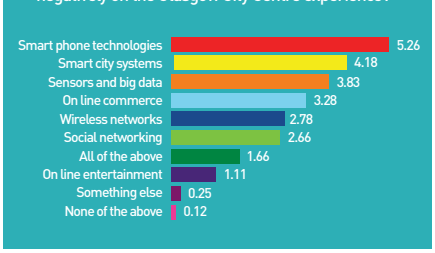
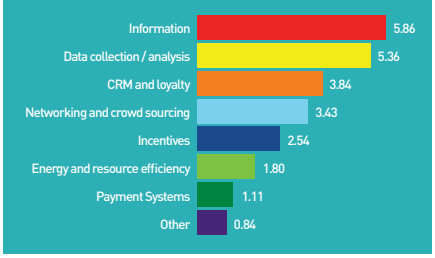


9. What are the emerging digital technology developments that will most impact positively or negatively on the Glasgow City Centre experience?



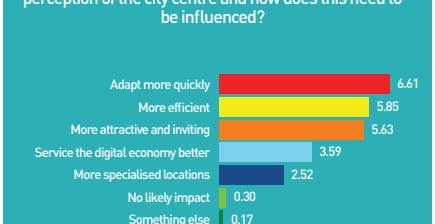
Voting Session 4
1pm Friday

10. How can technology best enhance the consumer experience of the city centre?

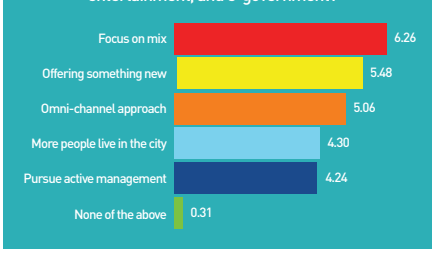


11. What are the chief opportunities in using digital technologies and data analytics to more effectively monitor and manage the city centre to enhance the management of the city centre?

12. What are the potential impacts of these changes on the physical form and function of the city centre and the perception of the city centre and how does this need to be influenced?



13. Overall, how do city centres remain relevant with the growth of online fulfilment localised entertainment, and e-government?



References

BBC. (2014). Glasgow formally signs £1bn investment city deal. from http://www.bbc.co.uk/news/uk-scotland-glasgow-west-28872687

Boyer, B., & Hill, D. (2013). Brickstarter: Sitra.

Cameron, E. (2014). InvestGlasgow [PowerPoint Presentation]: Glasgow City Council.

fDi. (2014). European cities and Regions of the Future 2014/15: Winners (February/March ed., pp. 19).

Future City Glasgow. (2013). Future City | Glasgow. from http://futurecity.glasgow.gov.uk/

Glasgow City Council. (2014a). Digital Glasgow Roadmap. from http://www.glasgow.gov.uk/11205

Glasgow City Council. (2014b). Glasgow becomes first Scottish city to offer free Wi-fi. from http://www.glasgow.gov.uk/index.aspx?articleid=12292

Glasgow City Council. (2014c). Glasgow City Centre Strategy. from http://www.glasgow.gov.uk/index.aspx?articleid=9935

Oldenburg, R. (1989). The great good place: Cafés, coffee shops, community centers, beauty parlors, general stores, bars, hangouts, and how they get you through the day: Paragon House New York.

Renew Newcastle. (2011). About. from http://renewnewcastle.org/about

Rough Guides. (2014). Gallery: The World's Friendliest Cities - As Voted By You. from http://www.roughguides.com/gallery/the-worlds-friendliest-cities-as-voted-by-you/ - /15

San Francisco Planning Department. (2013). San Francisco Parklet Manual (Vol. 1.0, pp. 86). San Francisco: Pavement to Parks.

Scottish Government. (2012). Go-ahead for Glasgow city centre regeneration.

(Endnotes)

1. Clark G, Moir E, Moonen T What are Future Cities? Meaning Origins and Usages 2014 Future Cities Catapult and UK Government Office for Science.

Glasgow Chamber of Commerce
30 George Square
Glasgow
G2 1EQ
www.glasgowchamberofcommerce.com
chamber@glasgowchamberofcommerce.com

Urban Land Institute
50 Liverpool Street
London
EC2M 7PY
www.uk.uli.org
uk@uli.org

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