



Subject:	A Smart City framework to support the innovative delivery of the Belfast Agenda
Date:	14 June 2017
Reporting Officer:	Ronan Cregan, Director of Finance and Resources
Contact Officer:	Deborah Colville, Smart Cities Portfolio manager Mark McCann, Business Research and Development manager

Restricted Reports	
Is this report restricted?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
If Yes, when will the report become unrestricted?	
After Committee Decision	<input type="checkbox"/>
After Council Decision	<input type="checkbox"/>
Some time in the future	<input type="checkbox"/>
Never	<input type="checkbox"/>

Call-in	
Is the decision eligible for Call-in?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

1.0	Purpose of Report or Summary of main Issues
1.1	To present Members with a proposed 'Smart Belfast' framework that seeks to harness the talent of the city's digital SME sector, and our world-class university research, to support the Council, community planning partners and local communities to create more innovative solutions to complex public policy challenges as identified in the Belfast Agenda. This work is part of a wider ambition to foster innovative methodologies and complements the Council's parallel work on Social Innovation with local communities and our corporate commitment to service transformation.

1.2	<p>The Smart Belfast framework is the product of a twelve-month co-investment agreement between the Council and the UK Future Cities Catapult which also delivered a series of ‘demonstrator’ projects that utilised a mix of ‘smart city’ approaches to address current city issues. (One of these demonstrator projects has already identified more than £370,000 of additional annual Rates income for the region.)</p>
1.3	<p>This report provides an overview of the framework and the results of the demonstrator projects. It also sets out a proposed programme to deliver the Smart Belfast framework within a wider Council commitment to innovative service delivery. It also includes details of an offer from Invest NI to support a ‘Smart Belfast’ challenge programme which has the potential to provide over £860,000 funding support to local SMEs. And an offer from the Digital Catapult to provide £50,000 funding support to local SMEs for an innovation challenge around the city’s visitor experience.</p>
1.4	<p>At its June 2017 meeting Strategic Policy and Resources Committee agreed to:</p> <ul style="list-style-type: none"> • Consider and adopt the Smart Belfast framework as a basis for driving collaborative innovation between city partners. • Agree the proposed programme of work including the delivery of a Smart Belfast challenge programme with Invest NI and the delivery of the Digital Catapult’s open challenge competition on the visitor experience. • Agree to a September launch event for the framework and Challenge programme. (Details to be issued to Members later in the summer.) • Agree that the Council develops an approach to innovation that integrates opportunities presented by the Smart Belfast work, the Social Innovation programme with communities, and the organisational development programme
2.0	Recommendations
2.1	<p>Committee is asked to:</p> <ul style="list-style-type: none"> • Note the contents of the report including plans for the launch of a Smart Belfast framework and supporting Challenge programme for SMEs in September 2017.
3.0	Main report
3.1	<p><u>Key Issues</u></p> <p>Many cities around the world have created ‘smart city’ frameworks that aim to foster the conditions in which city partners can better exploit leading-edge technologies, data science</p>

and industrial design practices to address urban challenges in more innovative ways (while at the same time providing a welcoming environment for start-ups and entrepreneurs to develop new products).

3.2 Places such as Glasgow, Dublin, Bristol, and Manchester are successfully using such frameworks to:

- leverage substantial private sector investment and grant funding (e.g. Innovate UK and Horizon 2020 funding);
- provide a creative environment in which local digital SMEs and entrepreneurs can develop new products and services;
- deliver innovative joint projects that make substantial contributions to urban challenges such as waste, energy, traffic and water management; and
- Improve public services for citizens and communities.

3.3 At the January 2016 SP&R Committee, Members agreed that the Council would co-invest with the Government's Future Cities Catapult in a twelve-month programme to design a bespoke Smart Belfast framework that would seek to tap into our city's own unique strengths (particularly our growing digital sector) to support the delivery of elements of the Belfast Agenda. The joint programme also included a commitment to deliver a series of 'demonstrator' projects which would be used to build the Council's capacity in this area whilst also delivering solutions to real-world problems.

3.4 The 'demonstrator' projects

The programme adopted a 'learning by doing' approach: delivering a number of substantial 'demonstrator' projects that provided practical learning and 'proofs of concept' as the framework was developed. These projects included:

1. **Business Rates Identification:** Historically it has proven difficult to maintain an up-to-date Rates Register of businesses. (This is mainly due to the dynamic nature of the city's economy with a large number of businesses opening, closing or moving in any given financial year). The existing approach to maintaining the list is expensive and time-consuming resulting in significant loss in potential Rates income for Council and the NI Government.

To address the issue the Council, working with colleagues from Land and Property Services and the Department for the Economy, ran a Small Business Research Initiative (SBRI) competition which provided small pots of R&D money to six SMEs to develop innovative solutions to this problem. In a second phase of the competition two

of the SMEs were provided further support to develop machine-learning proto-types. In their first iterations these solutions identified nearly £370,000 of new recurring non-domestic Rates revenue for the region. Further iterations are expected to grow this figure.

In addition, the project attracted £100,000 of funding from Department of Finance and has been featured nationally as a best practice example of SBRI. Both companies have also indicated that they intend to develop their proto-types into commercial products which they plan to sell to cities across the UK.

2. **Belfast Growth-planner:** Working with the Planning Department the Smart Cities team developed a software tool - the first of its kind in the UK – that supports urban planners in determining the capacity of different parts of the city for future physical development. It includes user-friendly analysis of utility provision, water, transport and housing growth capacity.
Partners are keen to continue development of this product with the Council and use it to promote Belfast's reputation as a place to innovate and develop complex tech solutions.
3. **A Rates forecasting model** sought to build upon the Council's new planning authority role to support longer term financial forecasting. A design-led process has established the likely approach – with further work required to gather relevant data from public sector partners. The project will also inform the specification of the city's future planning system.
4. A specification was developed for a **city indicator dashboard** to support Members and Community Planning partners to track the impact of the Belfast Agenda over time.
5. **Ipedal:** This R&D collaboration between the Council, See.Sense (a local SME), BT, Next Bike and Queen's University seeks to deploy state-of-the-art motion sensors on a number of the city's bikes. The project seeks to understand cycling behaviour (including bike theft) and may inform future bike lane investment decisions. The project also has the potential to identify pot-holes and to measure local air quality. The project attracted £5,000 of co-investment from the Department of Infrastructure and substantial in-kind investment from BT and See.Sense.
6. **Waste Management analytics:** The Council has been awarded 20 hours of world-class 'big data' analytics expertise to analyse household recycling behaviour with the aim of providing insights that can assist in driving up recycling levels.

	<p><u>The Smart Belfast framework</u></p> <p>3.5 The Smart Cities team drew practical learning from the delivery of these demonstrators to identify the key elements of the framework. The team also drew on the best practice of other cities and adopted many of the concepts in the BSI Standard for Smart Cities (PAS 181)¹. They also engaged with a broad range of local stakeholders through a series of workshops, one-to-one interviews and an online co-design process.</p> <p>3.6 In general there was strong support for the concept of a Smart framework, particularly from the local SME community which saw it as an opportunity to deploy proto-types and products in a real-world environment, and from public sector partners who recognised the potential to bring innovation to bear on existing challenges. There was also broad agreement that Belfast City Council has an important convening role to play in bringing a diverse range of partners together for a common social impact.</p> <p>3.7 The resulting framework is attached as Appendix One and sets out the following:</p> <ul style="list-style-type: none"> - The guiding principles for a Smart Belfast - The ‘foundations’ that the city needs to have in place to deliver innovative programmes - A pipeline of potential projects that can directly contribute to the Belfast Agenda whilst also strengthening the city’s smart foundations; and - A roadmap that describes proposed workstreams and resources. <p><u>The foundations for a Smart Belfast:</u></p> <p>3.8 Belfast has a growing community of innovators, designers, researchers, data scientists, and technologists. The city also has a strong digital infrastructure (enhanced by our recent investment in Superconnected Broadband and City WiFi) that offers first class connectivity for organisations and individuals. However, in order to harness these resources to better address city challenges, the city needs to strengthen four ‘foundations’:</p> <ol style="list-style-type: none"> 1. Shared understanding of city challenges: Partners need to find new ways to work together to understand and analyse shared problems. There is the opportunity to adopt innovative ‘design-led’ approaches from industry that allow public sector partners to think differently about challenges, and then to develop and test their ideas before applying them at scale.
--	--

¹ <https://www.bsigroup.com/en-GB/smart-cities/Smart-Cities-Standards-and-Publication/>

2. **An engaged innovator community:** If we want to co-opt the local SME sector and our universities to tackle challenges together, we need to find new ways of doing this beyond traditional procurement channels. These might include establishing innovative city challenge programmes, Small Business Research Initiatives (SBRIs), R&D collaborative agreements, social innovation programmes, competitions, joint investment vehicles, etc.
3. **Building city data assets:** In a modern knowledge economy access to data is as important an economic resource as access to financing or a skilled workforce. There is a growing demand from digital SMEs for access to public data that will allow them to create new products and services. Partners in a smart city need to get much more sophisticated in how they generate, manage and share public data safely and securely.
4. **Robust delivery mechanisms:** City partners need to find better ways of attracting investment; co-opting the support of partners; and designing agile delivery mechanisms that can develop ideas, test them, and rapidly scale proven successes in timescales that are measured in weeks rather than months.

Roadmap

3.9 The framework identifies a series work strands that the Council and its partners need to deliver in order to strengthen the foundations described above:

1. **Building governance structures** A cross-sector group to guide the Smart Belfast work; build partner commitment; provide data assurance, and contribute to the delivery of the programme.
2. **Building the Smart Belfast team** The Council and other city partners to build a core team to champion the approach; to engage with challenge owners, and; to coordinate collaborative programme and projects.
3. **Building engagement channels** Utilise digital and more traditional engagement methods for coordination and to communicate the smart city work with stakeholders including local communities, while promoting Belfast as a place for innovators to invest.

4. **Building the innovation network** Provide mechanisms and opportunities for responsive, agile partnerships to deliver projects that address city challenges. These partnerships would draw upon Social Innovation or Living Labs² -style techniques to better understand challenges and work towards solutions.
5. **Building IoT and data infrastructure** Individual projects generate lots of data that can often be developed into a shared city platform that can be used by other innovators. Internet of Things (IoT) technology allows cities to deploy inexpensive sensors for a vast range of purposes from air quality monitoring to tracking tourist and retail behaviour in the city centre.
6. **Building innovation experience** Providing new procurement challenges through such mechanisms as open calls and competitions supported by an Innovation Fund.

Smart Belfast project pipeline

3.10 The aim is to drive the framework through the delivery of challenge-focused projects. That is, the Council and its partners will identify a series of projects over the next period that build our capacity as a Smart City, but also, at the same time, practically address Belfast Agenda challenges.

3.11 Over the past few months officers have engaged with partners (including Tourism NI, Department for Infrastructure, Queen's and Ulster University) to draw up a pipeline of likely projects for which there is a demand from 'challenge owners' and potential smart city solution-providers. Further work is required to identify collaborative investment opportunities but emerging proposals include:

- **A circular economy grand challenge:** A SME-led challenge in support of the Resourceful Belfast strategy to rethink the city's waste as an economic resource.
- **A Belfast Health and Leisure Passport:** Developing a detailed understanding of the physical activity citizens to improve programmes and interventions and enhancing the impact of the Council's £105m leisure transformation programme.
- **Public transport challenge:** Nearly half Belfast's workforce travel to work by car. Attitudes to travel by public transport or active travel remain a barrier. As major improvements to public transport are completed (Belfast Transport Hub, Rapid Transit System), this barrier will need to be lifted in order to maximise these opportunities.
- **City centre parking:** Adopting new technologies to understand driver behaviours and providing interactive solutions to address the parking challenge.

² <http://www.openlivinglabs.eu/FAQ>

- **Building an integrated employment pathway:** Belfast has a complex, underperforming employability pathway with many providers offering a broad range of interventions for those working towards employment. A key step is understanding employability as a total system.
- **Understanding visitor trends:** Building a more sophisticated model of tourist and conference delegate behaviours to enhance the city experience.
- **Leveraging the public estate:** Drawing on new technologies to provide innovative ways of managing the wider public estate including the planned leisure estate.
- **Understanding the future labour market:** The Northern Ireland Skills Barometer reveals areas of significant imbalance, such as an undersupply of STEM skills, and an over-supply of hospitality skills. More work is needed to create actionable insights at a local level.

Smart Belfast Challenge programme

3.12 Invest NI has been particularly supportive of a Smart Belfast and have identified it as an opportunity to provide R&D support to the region’s burgeoning digital SME sector. They also see it as a means by which city partners can develop ideas that may form the basis of future applications to the Government’s Innovate UK³ funding programme. As Members may be aware, over £2 billion of innovation funding is being provided to business growth sectors over the next few years – with urban infrastructure challenges being a particular focus for funding. Work on Smart Belfast challenges can provide important experience in the development of more complex future applications to Innovate UK.

3.13 Invest NI is therefore proposing to provide up to £25,000 each to eight SME-led networks addressing four or five Smart Belfast challenge areas over an eight month period. These networks would then be eligible to apply for a second phase of funding of up to £170,000 each to help them design proto-types and concepts that address a Belfast challenge. The potential maximum funding pot available is approximately £860,000.

3.14 To deliver the programme the Council would be expected to facilitate engagement between city partners and work with the network members on the challenge areas. Officers are recommending that the Council work with Invest NI to deliver this programme with an initial ‘challenge’ workshop with partners in June 2017 and a public launch in late September 2017 at City Hall. Further details of this launch event will be presented to Members in August 2017.

³ <https://www.gov.uk/government/organisations/innovate-uk>

3.15	<p><u>Digital Catapult Open Challenge competition</u></p> <p>The Council has also been approached by the Northern Ireland node of the Digital Catapult. This organisation also support the concepts behind the framework and are offering to provide £50,000 of funding to local SMEs in a two-stage design competition to unlock local expertise in immersive technology to develop proposals to support the visitor experience in the city. The Catapult is seeking £25,000 of match-funding from Council in support of the competition (which is scheduled to open on 26 May).</p>
3.16	<p><u>Wider innovation ambition</u></p> <p>The Smart Belfast framework is part of a wider ambition by the Council to foster innovation in service delivery and it complements our parallel work on Social Innovation with local communities and the Outcomes-Based Accountability model adopted for community planning. Each of these strands adopts a number of core methodologies (such as design-led innovation, partnership working, agile and scalable deployment of projects, etc.) There is an opportunity to support a growing innovation culture within the Council by incorporating these Smart City and Social Innovation methodologies into aspects of the Organisational Development programme.</p>
3.17	<p><u>Financial & Resource Implications</u></p> <p>During its first twelve months the Smart Belfast work has already attracted over £200,000 of co-investment (from Future Cities Catapult, Department of Finance and Department for Infrastructure). The Smart Cities team also led the successful application to the 100 Resilient Cities programme which will attract substantial funding from the Rockefeller Foundation over the next two years. This ability to attract co-investment is only likely to grow during the implementation phase – particularly if the framework is successful in creating the conditions for attracting Innovate UK funding.</p>
3.18	<p>Invest NI has offered to support SME partners to a potential value of £860,000 while the Digital Catapult has offered an initial £50,000. There are also offers of in-kind support from other partners including data science, Queen’s University and Ulster University (which include access to Phd researchers and UU’s new Cognitive Analytics and Research Laboratory).</p>
3.19	<p>Delivery of the first year of the framework will require a budget of £378,000. This total includes the delivery of six main work-strands:</p>

<p>3.20</p> <p>3.21</p>	<ul style="list-style-type: none"> • Smart Belfast framework implementation: £105,000 • Smart Belfast challenge programme with Invest NI and Open Challenge call with Digital Catapult: £55,000 • City data management and digital strategy: £70,000 • Further development of existing demonstrator projects: £123,000 • Develop new pipeline projects proposals £20,000 • Development support for a corporate Innovation programme £5,000 <p>Having been agreed by SP&R the financial implications for the framework outlined above will need to be considered as part of the year end finance report which will be presented to the June SP&R Committee.</p> <p><u>Equality or Good Relations Implications</u></p> <p>Equality and good relations implications will be taken into consideration and it is proposed that we will take this through equality screening; however it is anticipated that any collaborative efforts should have a positive effect on section 75 groups.</p>
<p>4.0</p>	<p>Appendices – Documents Attached</p>
	<p>Appendix 1: Draft Smart Belfast framework and pipeline of potential projects</p>