

Infrastructure Canada | Smart Cities Challenge

Oxford County, Blandford-Blenheim, East Zorra-Tavistock, Ingersoll, Norwich, South-West Oxford, Tillsonburg, Woodstock, Zorra

<p>Question 4</p> <p>Please describe the outcome (or outcomes) your proposal seeks to achieve by elaborating on your Challenge Statement.</p> <p>This section should include:</p> <ul style="list-style-type: none">• Specific goals you hope to achieve by implementing your proposal, justifying both the level of ambition and the achievability of the outcome (or outcomes) sought.• Baseline data and evidence to establish the current state with respect to the metrics used in your Challenge Statement, and context around the outcome (or outcomes) sought.• Evidence to support the selection of this/these outcome (or outcomes) over others, in reference to the	<p>Setting the Stage for the Oxford Smart Cities Application:</p> <p>It stands to reason that if we are to improve the wellbeing of residents in our community our most impactful opportunity lies in where our residents spend most of their time. Across North America, that opportunity lies in our buildings. In buildings we live, we work and we play. We live in buildings that are private or multi-residential dwellings, owned or rented. We work in storefronts, malls, offices, industrial complexes and factories of all shapes and sizes that cross multiple sectors, provide a wide variety of services and create products. When not in buildings, we are likely on-route to another building and in doing so, are most likely encapsulated within another form of building, namely a vehicle whether private or public, alone or with a group of passengers.</p> <p>According to the Heart and Lung Association, we in North American spend 90% of our time in buildings. A study published by the National Human Activity Pattern Survey (NHAPS) suggests we spend 87% of our time in buildings and another 6% of our time in vehicles. Research studies suggest the economic, social and physical environments that surround us can have a much greater impact on our health than how often we go to the doctor's office.</p> <p>In 2014, Oxford began a community journey that would result in the comprehensive Future Oxford Community Sustainability Plan. The underlying desired outcome of the Future Oxford plan is to shape the Oxford of tomorrow by taking definitive action today. In 2016, 60.3% of Oxford residents reported a positive sense of wellbeing and 78% reported life satisfaction. Oxford is a vibrant small urban-rural community that is proud of what we have and dedicated to an even brighter future for all. The Future Oxford plan was developed on the premise that strong Community health and wellbeing will flourish within a vibrant economy that supports a clean and healthy environment.</p> <p>As committed by Oxford County Council, achieving our Future Oxford vision includes achieving Zero Poverty. In 2016, 21.6% of Oxford households are living in core housing need (identified as living in a dwelling that is considered unaffordable, unsuitable or inadequate), 10.8% of our population is living in poverty and our social housing wait list has expanded to 1500 residents and families. There is no simple or single solution to addressing poverty in any community.</p> <p>Notwithstanding, access to affordable housing can be transformational to those less fortunate. In addition, through Oxford County's commitment to 100% Renewable Energy we estimate that Oxford residents could reduce their building related</p>
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needs of the community.

- Rationale for applying a smart city approach to achieving the identified outcome (or outcomes).
- Strategy for measuring progress toward outcome (or outcomes) and achievement of outcome (or outcomes).

energy consumption by as much as 50% through wiser, more thoughtful energy choices. New building technologies today can reduce heating and cooling energy consumption by as much as 90%.

Finally to the issue of community connectivity. As a founding member of the SouthWestern Integrated Fibre Technology (SWIFT) initiative, Oxford County has been an active participant in a Federal/Provincial/Municipal funding program designed to accelerate ultra-high-speed fibre broadband technology to small urban/rural communities across Southwestern Ontario.

With this in mind, Oxford's Smart Cities proposal brings the valued outcome of reducing poverty in our community while contributing to our 100% Renewable Energy goals through the transformation of new building construction. Where better to demonstrate the value of ultra-high energy efficiency where the housing created can also dramatically transform the health and wellbeing of the most vulnerable in our community. Our demonstration includes the building data collection and transparent information transfer that can only be accomplished through enhanced connectivity and an open data commitment. Oxford is committed to sharing building performance and 100% Renewable Energy data and achievements.

The Oxford Approach

Creating a healthy, affordable and energy efficient place to live, work and play is a pre-requisite to further development of all other aspects of sustainable living. Before people can begin to consider higher level thinking (such as innovation or environmental awareness) we must first address core needs. Addressing Shelter is the highest priority and most impactful to our wellbeing.

County Council has recognized the importance of expanding affordable and social housing in our community and has aggressively pursued its development through partnership and direct investment. In 2015 Council adopted a "Housing First" policy that ensures surplus property owned by the County is either re-purposed for affordable residential development or monetized for direct investment in affordable housing. Since the adoption of this industry leading policy, Oxford County has worked with the Private and Not for Profit housing sector, investing \$3,997,795 in Federal/Provincial Investment in Affordable Housing (IAH) funds along with an additional \$3,138,275 in municipal funding. Combined, these committed investments result in 126 housing units that have been developed or are approved for design and construction. Eighty (80) of the new housing units are being developed to Passive House and/or EnerPHit energy standards, projected to reduce energy consumption by up to 80-90% of traditional Ontario Building Code requirements.

Quality and affordable housing is transformational to those living

in poverty. Affordability is enhanced dramatically by building energy performance. In addition to building energy performance, air quality and comfort levels is substantively enhanced within Passive House/EnerPHit standard buildings.

Through our Smart Cities proposal, Oxford can dramatically enhance the lives of the most vulnerable in our community. Our proposal demonstrates that our Future Oxford Community Sustainability Plan implementation will be accelerated through connected technology and data outcomes associated with the built environment. With buildings and our most vulnerable population as the focal point of our program, we will demonstrate the Future Oxford plan through advanced building technology. Open data and public dialogue illustrating the results will empower others to follow.

The Future Oxford Community Sustainability Plan is best illustrated by the three pillars of sustainability. In fact, advancing Economic vitality, Community health and wellbeing and taking definitive action to enhance our natural Environment is the essence of the Oxford Smart Cities application.

The Oxford Smart Cities approach will:

1. Emphasize Affordable, Accessible and Energy Efficient Shelter Using Advanced Building Technologies:

- Reduces Core Housing needs in our community
- Reduces the financial burden, time and stress through housing stability for the most vulnerable
- Improves the personal security and stability of the most vulnerable
- Enhances the personal wellbeing, mental and physical health of the most vulnerable by:
 - Creating disposable income to address food insecurity
 - Opportunity for improved diet and exercise
 - Enhanced in home air quality and comfort
- Advances Oxford's commitment to achieving Zero Poverty enhances our overall Community Wellbeing Directly enhancing Oxford's COMMUNITY (Health and Wellbeing)

2. Advanced Building Technology Implementation Led by the Not For Profit sector will:

- Demonstrate the value of advanced building technologies
 - Capital cost effective
 - Operating cost effective - conserves energy by reducing building related energy use/costs
 - Reduces greenhouse gas (GHG) emissions
 - Reduces dependency on fossil fuels
- Advances Oxford's commitment to achieve 100% Renewable Energy

- Optimize opportunities to advance the value and application of renewable energy opportunities (Solar, RNG, energy storage) through Net Metering and Virtual Net metering applications
 - Enhances our natural environment and eco systems
 - Reduces waste, support Oxford's commitment to achieving Zero Waste
 - Enhances air quality
 - Reduces Climate Change risks
- Improves community health and wellbeing
- Creates economic growth through new and expanded business opportunities
- Enhances the viability and community value of an Oxford Sustainability Cluster (Living Lab) for Technology commercialization research and development in partnership with academia and industry
- Enhances community readiness and support for entrepreneur growth/development and that will advance:
 - Renewable energy solutions and technologies
 - Advanced Zero Waste technologies and programs
 - Agricultural advancements
 - Stimulate social enterprise
 - Create enhanced arts, culture and educational opportunities
 - Enhance community access and connectivity
 - Enhanced access to medical care and other services that enhance wellbeing
 - Open data sources
 - Information sharing
 - Demonstrating sustainability achievements and performance
 - Encourage accelerated implementation and achievement
 Directly enhancing Oxford's ECONOMY, COMMUNITY (Health and Wellbeing), and ENVIRONMENT.

Proposal Openness

By using shelter as the nucleus of our Smart Cities plan, we will link every aspect of our sustainability plan back to our built environment. Starting with the most vulnerable residents in our community, we will establish a high-performance place of shelter that will enhance quality of life for the occupants, while setting a stage for advancement of other services. It is not enough to design, model and construct a building; post-occupancy performance and ongoing data mining and analysis of outcomes (technology and social) will form the basis for our demonstration.

All lessons learned through each building connected technology

and data outcome will be leveraged across all other sectors within Oxford County and shared with any municipality across Canada interested in learning with us.

Oxford County has already set the stage for sharing and transparency of our Smart Cities approach through the Oxford County Internet project page Build-Better (Blossom Park). We invite readers to visit this site and monitor our progress in real-time by partnering with us in this journey through your comments and questions.

Proposal Integration

Our building projects are modeled to several standards, including Ontario Building Code, Passivehouse, EnerPhit standard and Canada Green Building Council Zero energy building standards. But that is just a beginning. Our building projects will experience extensive performance monitoring and reporting and by design, will be required to address sustainability themes as noted above. Ongoing communication with stakeholders and partners will be conducted, with success and failure outcomes analysed in the spirit of continuous improvement.

Our Build-Better approach transcends the concept of building technology as a means to an end. Silos are inherently created simply by not taking the approach to building outcomes far enough. By designing the six data and connected technology themes that are outcomes of our sustainability plan, we propose that barriers between technologies and services will dissolve naturally.

Proposal Transferability

All identified improvements and linkages to other sustainability themes are inherently transferable across sectors and across jurisdictions throughout Canada.

Linkages from multiple service themes, via building technologies that are based on a goal of improving quality of life within the context of a limited environment will naturally drive value transfer. We are not addressing multiple services in isolation; we are in effect, transferring value to people and organizations through subtle integration of multiple services, and doing so where people are located, most of the time.

Concepts and outcomes developed through our approach to building technology and data will be immediately transferable, and as we improve processes and outcomes, this transfer of knowledge will only accelerate.

Proposal Collaboration

Collaboration is at the root of our Sustainability Plan and by incorporating the service concepts of well-being, eco-system, innovation, connectivity, energy and zero waste into the built environment, we engrain the concepts of collaboration across multiple sectors.

Building on the spirit of our Future Oxford Partnership and Sustainability plan, partnerships will continue to mature and the various elements of our sustainability plan develop as a result of creating the story of connected technology and data harvest through the built environment.

The Oxford baseline

In 2016, Oxford County created an energy and waste baseline profile with a goal of identifying energy consumption and waste generation across all sectors and from every resource. This baseline has since grown to include a community-wide Greenhouse Gas (GHG) inventory. In 2018, we intend to continue building on our baseline approach to include drivers of poverty within our community.

Our sustainability plan includes several very aggressive goals that include targets, timelines and milestone dates. These goals are helping us to establish programming and milestone accomplishments that would otherwise be intangible; all of our goals must be driven by established baseline data if we are to be successful in our measurement of outcomes.

Thinking back to the sections of collaboration, transferability, integration and openness, it becomes apparent that multiple services must converge and work from a commonly understood baseline.

In November 2017, Oxford County Council adopted a resolution to target Zero Poverty in the County. Our first building project will tackle the challenges of affordable, healthy housing for those with mental health and addiction challenges.

In 2016, 21.6% of Oxford households do not meet core housing need, 10.8% of our population is living in poverty and our social housing wait list has expanded to 1500 residents and families. There is no simple or single solution to addressing poverty in any community. Notwithstanding, access to affordable housing can be transformational to those less fortunate.

- Evidence to support the needs of the community
Our projects aim to illustrate that technology already exists to tackle many of the challenging aspects of poverty, affordability and healthy environment. Our first project (Blossom Park) will be constructed to Passivehouse standard and will demonstrate that

energy requirements for heating and cooling can be reduced by up to 90%, indoor air quality can be substantially improved and utility costs can be substantially lowered. Furthermore, performance data will be harvested and studied to both validate our claims and to identify required areas of improvement where outcomes fail to meet expectations based on modelling predictions.

By enhancing the built-environment and integrating multiple services through the lens of poverty reduction and quality of life, we believe our approach will accelerate multiple human services in ways that other initiatives with a single outcome cannot come close to achieving.

- **Rationale for applying a smart city approach**

The Smart City approach as defined within The Smart Cities Canada Challenge parallels the Oxford Community approach to accomplishing goals. Our Future Oxford Sustainability plan is based on the same core values. We have demonstrated this through our many outcomes that span the very same service improvements represented in the Smart Cities Challenge guideline.

Even before the Smart Cities program launch, Oxford County and partners were in the process of planning a Sustainability Cluster concept; an approach that would combine technology and social innovation and incubator/living-lab concepts based on a campus style approach and through collaboration with multiple partners.

- **Strategy for measuring progress**

Most of our baseline studies required for establishing a baseline are already in place. Our sustainability plan includes 70 outcomes that continue to be measured and adjusted and we continue to monitor and adjust outcomes through ongoing monitoring and reporting (through both internal and third party audit and reporting processes).

In terms of connected technology and data outcomes of our building projects, we have an established team of research scientists from academia, private sector professionals (both volunteer and contract) and members of staff from across multiple services.

A primary focus of our Smart Cities Build-better approach is to plan for expected outcomes, design to aggressive performance standards (Passivehouse for example), apply stringent quality control and to conduct comprehensive and long-term performance monitoring that includes building performance, occupant comfort and cost-effectiveness (from both a capital and O&M perspective).