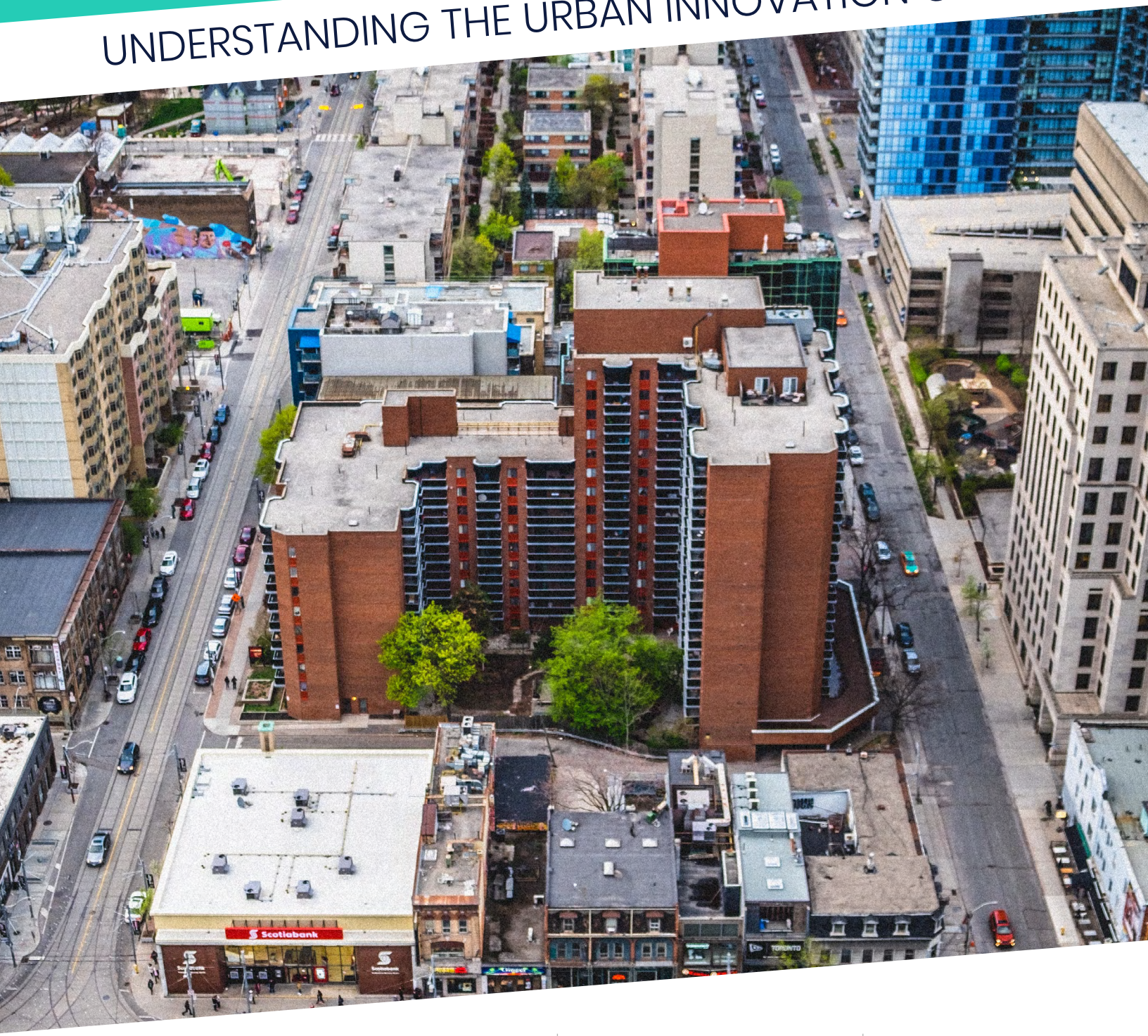
NOT 'WHAT', BUT 'HOW'

UNDERSTANDING THE URBAN INNOVATION CYCLE



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Not 'What', But 'How' Understanding the Urban Innovation Cycle

This is not a report about smart cities

The concept of smart cities - places that enhance the quality of living for residents through the application of information and communication technologies - has been interpreted and packaged in myriad ways ever since the concept emerged in the 1990s and took hold in the 2000s. The fact that no consensus definition of smart cities exists could potentially lend itself to inclusivity. Yet in talking with many local and regional public bodies throughout North America, we started to get the sense that they believe smart cities are something that is happening elsewhere.

So instead of a report about smart cities, this is a report about urban innovation: the ongoing, evolutionary journey of trying new things to improve your city. Unlike smart cities, urban innovation is something that we know is happening in places of every imaginable size and in all corners of the world.

But just because we know innovation is happening everywhere, it does not necessarily give us a better idea of *how* it is approached in different places. We formed a loose hypothesis: that even though the products of urban innovation might change from place to place, it would look pretty similar everywhere in terms of process. We theorized that it would evolve through cycles of innovation: multiple iterations of exploring what others had done, discovering potential solutions, testing these ideas to see how they work, and sharing the results to help peers make informed decisions.

To test our hypothesis, we surveyed 581 local and regional public sector representatives from all over the United States and Canada about their

approach to innovation. We learned about the pain points and successes that are encountered when it comes to discovering new ideas, piloting solutions, and communicating results. We discovered that over 40% of participants utilize 'innovation pilots' as a model for small-scale experimentation of solutions. We found that learning, piloting, and sharing innovation is possible on a wide range of budgets. And we were very happy to have our instinct confirmed: innovation is occurring in places of every size, from rural hamlets to megacities.

This being said, we also received a handful of (digitally) raised eyebrows about what we meant by terminology such as 'innovation cycles' and 'pilot programs', all of which highlighted something we had hoped to avoid when we framed this report around innovation instead of smart cities: excluding participation because of unclear terminology. So with the need for inclusive context in mind, we have integrated our survey data into a 'question and answer' format to increase the likelihood that the glimpse we are providing into the inner workings of urban innovation is both clear and inclusive.

Overwhelmingly, the most common sentiment we received over the course of the project was the desire to learn about the process for innovation in other places: how others are approaching common challenges, defining success, discovering new ideas, piloting solutions, and sharing results. We want to thank everyone who took the time to help us with our survey and hope that the contents of this report are a welcome first step to answering these questions.

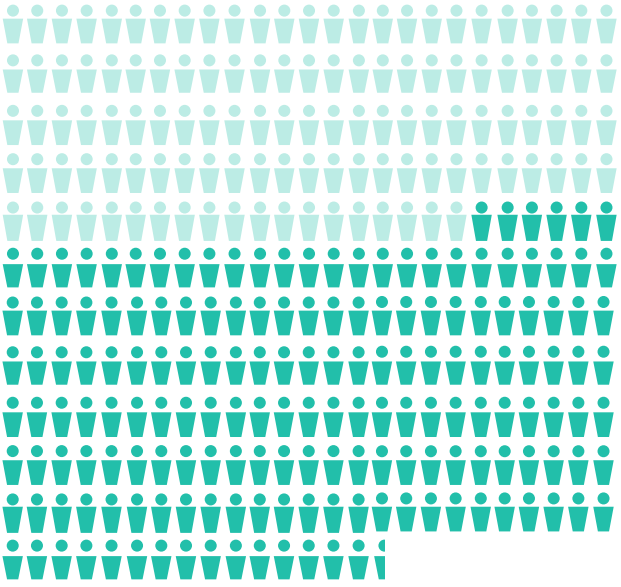
Our Survey

In order to better understand how innovation is being approached in Canada and the United States, we surveyed representatives from public bodies - which we defined as local and county governments of all sizes, public utilities, and special districts - located all across the US & Canada. Our survey was distributed via email to a select sample of top-level local government practitioners and officials, such as city managers and clerks. We also included technology and innovation managers in local government.

Representatives from 581 public bodies elected to participate in our survey. The survey consisted of a combination of "yes/no", multiple choice, and short answer questions. Following the survey, we spoke with a range of participants who had expressed interest in participating in a follow-up interview. The format was semi-structured: all interviewees were asked the same set of questions, but we allowed for the conversation to flow and asked additional questions as they arose.

Participants indicated a broad acceptance of the innovation life cycle as a model for how ideas are discovered, piloted, and shared. Nearly 41% of the 581 participants indicated that they utilized some form of an innovation pilot in 2018, which is a significant indicator that a certain process for testing solutions is being utilized.

We thank all of the 581 participants who took the time to participate in our survey. For additional survey response data, please write to contact@newcities.org.



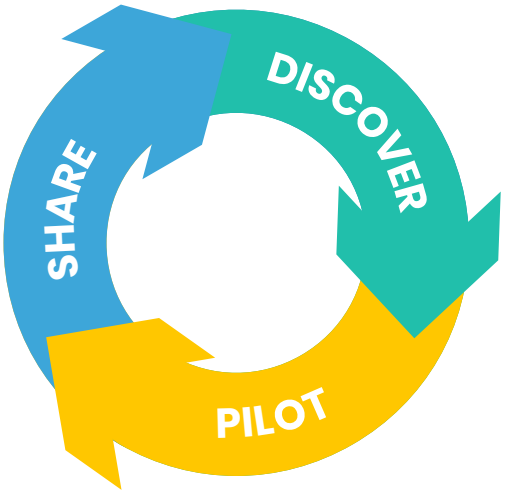
238 (40.96%) attempted at least 1 innovation pilot in 2018

581 participants surveyed.

Discover-Pilot-Share: Introducing the Innovation Cycle

In setting out to discover what comprises the 'how' of urban innovation in North America, we wanted to have a model against which we could test our ideas. We hypothesized that innovation as a process would require a few key steps: exploring what others had done, discovering potential solutions, testing these ideas to see how they work, and sharing results and experiences. We also hypothesized that this process-based model would begin with setting desired outcomes. As challenges, approaches, and solutions evolved, how we define success is evaluated and outcomes framed would also change. In both hypotheses, innovation is iterative and ongoing; not just a journey, but a journey made easier by the information provided by others.

Our cycle is composed of three phases: discovery, piloting, and sharing. In the discovery phase, a local public body identifies a challenge within their community and begins looking for viable approaches and potential solutions to the problem. Upon learning about a potential solution, they want to test it to see if and how it works. The piloting phase would be where a public body can evaluate whether this solution meets their desired outcomes. Following the piloting phase, it is time to share experiences and results with the local community and peers. This launches the cycle anew, with efforts undertaken within the sharing phase of one public body supporting the discovery phase for another.



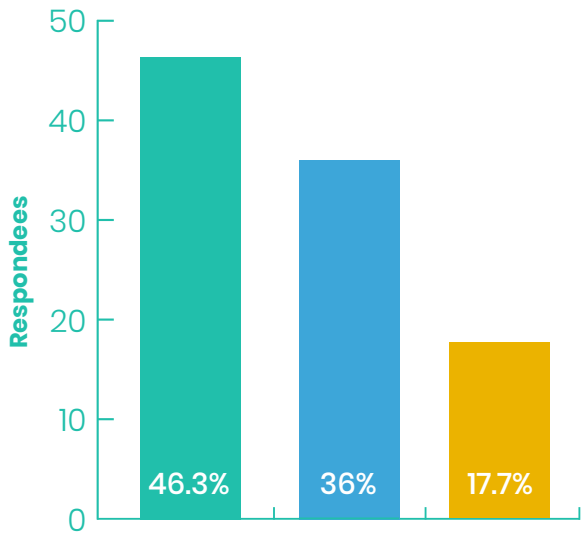
Discover-Pilot-Share

Does all urban innovation follow this cycle?

Not necessarily. For example, while our survey data showed that 41% of participants engage in innovation pilots, it doesn't mean that the other 59% aren't innovating. Piloting is just one way of testing out a solution, and our follow-up interviews highlighted the importance of a strong platform for sharing results. Multiple participants noted that robust results for a pilot in one context can be sufficient grounds for skipping the piloting phase and moving straight to implementation in another.

Even if a public body isn't using pilot projects, or does not approach innovation with a phased approach, the innovation cycle model can be useful for understanding challenges and strategies for success.

For instance, 46.3% said they found the discovery phase most challenging. They cited staffing limitations and the amount of time available to research potential solutions, or how the lack of a streamlined method of identifying possible solutions approaches makes the task more difficult. 36% of participants noted how managing and tracking a pilot project and coordinating among vendors requires staffing time, skills, and capacity that can be hard to come by. And 17.7% of survey participants noted how sharing results is particularly difficult, both due to sharing failure publicly and because of a lack of platforms for disseminating results. Multiple participants also spoke about how the quality of each and every process goes a long way to informing the quality of a final product.



Figuring out what to pilot can be difficult.

We asked which part of the innovation cycle (discover - pilot - share) is the most challenging.

- 46.3% indicated finding potential solutions
- 36% indicated that managing the pilot itself
- 17.7% indicated sharing their results

DISCOVER

How are potential approaches and solutions discovered?

A number of the government bodies we surveyed made it clear that they see the act of discovery as comprising two complementary phases: brainstorming and vetting.

For brainstorming, public representatives learn about what's going on in a similar way to most of the population: internet searches. When a government identifies a challenge in the way it's functioning, it seeks out various approaches to come to a solution. In attempting to frame the challenge at hand and define the desired outcomes, governments turn to others to vet approaches.

When it comes to vetting the quality of an idea without testing it oneself, a strong professional network is invaluable for learning from and sharing with peers. Strong relationships with peers in other governments are also useful for ideation of solutions that are at least partially vetted, particularly for smaller government bodies where there are significant restrictions on time and money.

Academic literature and journal searches are seen as more useful for vetting than for ideation. Based on our results, academic literature is not a common source for public servants when they are trying to uncover a potential solution to a challenge. This may be due to paywalls that prevent non-academics from accessing studies in academic journals or the inability for academic literature to keep up with the rapid evolution of issues and potential solutions.

How are outcomes defined? What's considered innovative?

Taking the time to define target outcomes is a critical factor for success, and what's innovative depends on the desired outcomes; the most up-to-date technology isn't necessarily more innovative than something that already exists. As a general trend, ideas that help a government deliver services more effectively and reduce operational costs are often seen as the most innovative. But alongside efficacy comes the desire to improve the quality of life for the community and to ensure that all populations are fairly represented.

A significant number of survey responses indicated that an enabling environment for innovation is, in and of itself, innovative. Simply being encouraged to suggest unorthodox ideas and solutions goes a long way

to creating a culture of innovation. This sort of culture is not commonly associated with government, where there exists an ingrained fear of the political repercussions of failure. However, even in places where a culture of innovation already exists, the right architecture needs to be in place in order to support it. Having sufficient organizational capacity and appropriate infrastructure for managing data, tracking the progress of a project, handling communications, and ensuring data privacy, is essential to fostering an innovative environment.

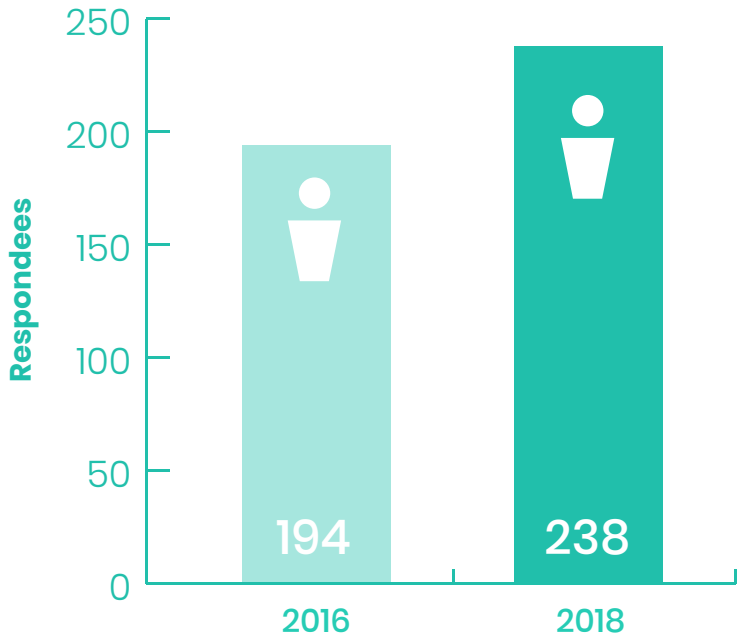
> **"It is our job to reduce costs and improve efficiency. The solutions and technology change, but the job doesn't. This was the job in 1990 and it will be the job in 2020."**
>
> Chief Administrative Officer,
> District of less than 5,000 inhabitants

PILOT

What constitutes an "innovation pilot"?

Innovation pilots are short-term 'test periods' that allow for potential solutions within a section of a town, city, or county. The amount of time allotted to each pilot is pre-determined before the test period begins, but typically ranges between six to twelve months.

But why do people pilot, instead of implementing off-the-shelf solutions at scale? Sometimes the problems faced by a community are fuzzy and undefined, or they simply don't have access to a clearly appropriate set of solutions, or the set of available solutions is incomplete or not aligned with the needs of the city. Piloting allows governments to test new approaches for a short period of time, without the risk of dedicating significant sums of money on a large-scale solution that might fail to meet desired outcomes.



The 238 respondees that attempted at least 1 pilot in 2018.

This is a 23% increase from 2016.

Who participates?

A prototypical innovation pilot is launched by a local or regional government in collaboration with a solution provider from the private sector or civil society.

For solution providers – which range from multinational companies to local startups – innovation pilots provide an opportunity to test their products or services in a live environment, which provides invaluable feedback in the late stages of testing and early stages of commercialization.

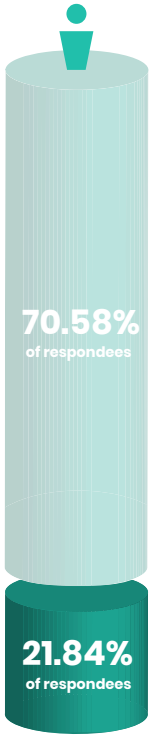
For public bodies, a major advantage of using innovation pilots is that they enable the testing of potential solutions to local challenges without incurring substantial up-front costs or risking the long-term impacts of deploying an ill-suited technology or selecting an unreliable service provider. There are a range of different business models for funding or financing a pilot project, and an uptick in collaborative approaches to testing solutions: increasingly, departments, agencies, and regional governments work together on the same pilot projects, allowing parties to have access to more ideas and approaches, and to reduce the risks by sharing costs.

This collaboration across departments and agencies is also a reflection of the increasingly complex nature of the challenges being addressed. Issues such as congestion don't stop at the city boundary and impact multiple agencies, such as public works, economic development, housing, and public safety.

When equity is stated as a target outcome for an innovation pilot, "who participates" can also expand to include community representatives, who act as "equity advisors" within the pilot.

Size is no indicator of success when it comes to population and budget

To see if we could uncover any insights into how innovation is being approached in different types of places, we disaggregated the survey data across four categories of population size (less than 5,000 inhabitants; 5,000–10,000 inhabitants; 10,000–100,000 inhabitants; and greater than 100,000 inhabitants). We discovered that while some public bodies dedicate significant budgets to piloting ideas within innovation cycle and others dedicate very little, this has little to do with population size. Moreover, for those who have the funds to take on pilot projects, dedicating a significant budget for testing ideas is not necessarily an indicator of success. Indeed, a wide range of budgets for communities of all sizes can result in successful innovation, proving that success isn't limited to large cities with large budgets.



Innovation is being pursued on a wide range of budgets.

Reported that they spent between:

$1 - $100,000 USD annually

Reported that they spent more than:

$100,000 USD annually

7.58% of participants did not specify a budget figure.

If it's such a great idea, why isn't everyone piloting?

Why doesn't everyone use innovation pilots? For many governments, organizational capability, resources, and funding are fundamental barriers to embracing piloting. Several participants, especially those from smaller communities, noted that their resources are simply too stretched and limited to put any time or money toward innovation.

> **"Day-to-day operations will often take precedent for time/ resources."**
>
> Top Appointed Official, City of 10,000 - 100,000 inhabitants

There is a distinction to be made between budgets and resources. In order for a public administration to take on piloting, they need to have enough resources, including staffing capacity and time, to direct toward such projects. One participant noted that "day-to-day operations will often take precedent for time/resources." However, once these limitations are overcome, the size of a budget put toward innovation projects doesn't matter. Resources are the hurdle, and once that hurdle is jumped, communities of all sizes, with small to large budgets, can successfully engage in innovation pilots.

Organizational resistance to innovation and the fear of public fallout in the case of failure are also common issues. Some survey participants noted that team members only want to get involved in projects that don't present any risk, which stifles innovation. For others, even if innovative ideas are presented, they struggle with getting approval from board members and councils, preventing them from moving beyond the discovery phase.

What thematic areas do innovation pilots cover?

Our survey data reveals that innovation pilots are being trialed in the full range of thematic areas for which a public authority is responsible, from public works and transportation to administration, finance, and information technology. Increasingly, many innovation pilots take on a cross-cutting approach, wherein various thematic areas and benefits are linked.

One innovation trend that our survey uncovered is that governing bodies are moving beyond the phase of opportunistic point solutions and increasingly looking at broader foundational approaches. Governments are seeking complex infrastructural strategies that aren't simply solutions for a single problem, but rather that can be applied to a number of issues. As one participant explained: "Complexity is increasing. Started out with 'solution based' approaches from vendors. Now they realize that there is much to be done around foundational stuff such as data governance, technology enablers."

> **"We want to establish a data strategy: a system which allows us to successfully manage and scale data intensive projects. It's not "sexy", but it's important foundational work."**
>
> Smart City Program Manager, City of greater than 100,000 inhabitants

Because innovation pilots are responses to identified challenges, they can just as easily be clustered by the benefits that they are attempting to deliver. This can include intangible benefits, such as well-being and quality of life for residents, as well as quantitative targets, such as improved transportation efficiency, less environmentally harmful waste management, and reduced carbon footprint.

> **"Equity. We want to ensure that innovation benefits every demographic."**
>
> City Manager, City of 10,000-100,000 inhabitants

What is the process for launching a pilot?

The process for launching a pilot varies from case-to-case. Some government authorities approach innovation pilots on an ad-hoc basis, where there is no defined strategy and the decision to try something new is often reactive. Some take a specific challenge approach, wherein they recognize that they have a challenge and launch a call for proposals which respond to this unique problem set. Other governments take a more systematic, planned approach: the City of Ottawa, Canada, for instance, has a dedicated web portal for solution providers to submit proposals for pilots which align with Ottawa's smart city strategy and economic focus areas.

In both the specific challenge approach and the systematic approach, the major milestones are similar. To begin, the local government outlines the need for an innovation pilot and decides on the timeline and pertinent logistical details, such as location. They then accept applications for a limited period before beginning the selection process. The innovation pilot is implemented in the trial area and its success is evaluated. Following the trial, a decision is made on whether to increase the pilot to a larger scale.

What does it mean for a pilot to be successful?

Our survey results saw 45.6% of participants claim that over half of their pilot projects are successful. Full disclosure: we entered into this research project with a loose hypothesis that a large majority of survey participants would be reporting success rates between 10-25%, based on the findings reported by numerous other organizations (only 10.6% of participants reported success rates between 10-25%). So while we were excited to hear that so many local governments are piloting so effectively, it did leave us collectively scratching our heads and wondering "how are different organizations defining success?"

In general, success is measured by whether or not the desired outcomes were achieved. Sometimes, this means implementing the pilot as a long-term solution; a decision which typically corresponds to a range of context-specific metrics set by the administration, which could choose to evaluate the pilot based on any number of criteria, from its cost savings to its environmental impact.

For example, the City of Dallas established an urban "lab" project with Dallas Innovation Alliance (DIA)

to prototype a smart city. The lab has seen the City implement nine projects since 2017, with thematic areas including lighting, water use, connectivity, and parking. The most successful of these projects replaced an area's street lights with smart LED lighting, which reduced energy usage by 35% during the 12 months. The City now believes that if implemented citywide, it could save $90 million over the life of the LED bulbs in energy and staff costs.

This project is an excellent example of a successful innovation pilot that checks multiple boxes for evaluation. The City was able to test out a smart lighting project through a partnership with little to no cost, while reducing energy consumption and civic operational costs, and the solution itself is capable of being implemented citywide.

MINI CASE STUDY

How successful innovation is defined in Portland, Oregon

Smart City PDX is a people-based data and technology project of the City of Portland and the Bureau of Planning and Sustainability. The project partners with the Portland community to help make the city a place where data and technology are used to improve people's lives, particularly in underserved communities. The Smart City PDX vision is to proactively prepare for future technologies to promote community-driven goals and values, and to do this by using data and technology responsibly to support a healthy, safe, more affordable and prosperous Portland for everyone.
We asked Kevin Martin, Smart City PDX Manager, how success is defined in Portland:

"Success means that a pilot becomes part of how the city operates – it scales, it is broadly deployed. The pilot addresses a problem identified by our underserved communities, and brings clear value to these communities. It has sustained budget and becomes part of the fabric of the city operations.

Even for a small pilot, it is hard to figure out if a pilot is successful. We have pilots that have been running almost two years that we still don't know if they will be 'a success'.

We have previously let the technology tail wag the dog, launching technology without clear criteria for success. Our focus now is on better community involvement in all stages of project development, from conception, implementation and closure. Our Equity Community Advisors will play a crucial role in shaping this work.

So what's the secret to successfully delivering meaningful outcomes?

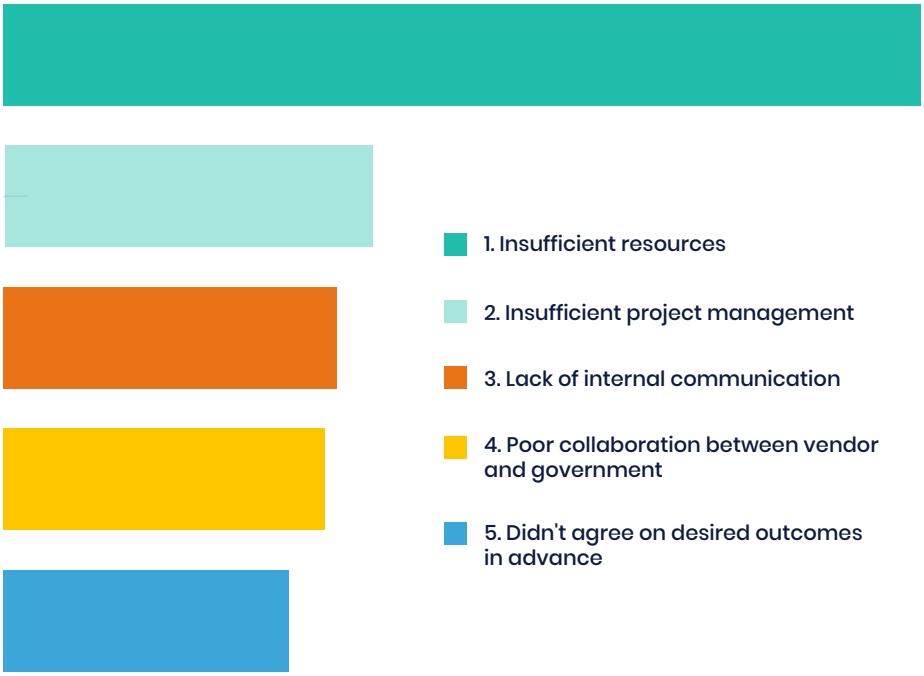
Our survey data revealed that there is no silver bullet approach that guarantees success.

That being said, during our post survey interviews a number of city representatives expressed that in the early days of piloting, they were more opportunistic in their approach to what they'd pilot – a civic interpretation of throwing a bunch of ideas against the wall and seeing what sticks. Several years on, they now view establishing the foundation for innovation as being the key to successful piloting.

Although some participants still report taking an ad-hoc approach to piloting, adopting a systematic, planned process leads to greater success. For 36% of participants, piloting represents the biggest challenge in the innovation cycle.

As reflected in the graphic below, there may not be a silver bullet for success, there are several ingredients which make success much less likely. While the single most reported cause of failure is a lack of resources, four other factors, which all represent poor organization and management of projects, together form the most significant reason for pilot failure. From agreeing on desired outcomes in advance to maintaining sufficient internal communication throughout, systematic project management from the outset is an indicator of project success. This means implementing thoughtful approaches for both discovery and sharing, such as civic data platforms, open data strategies, standardized approaches to financing new ideas, and project management tools and platforms.

When pilots aren't successful, there are a number of reasons. We asked what the most important contributing factors were.



SHARE

Why share approaches and results?

Sharing results, both internally and with peers, is essential for strengthening the innovation life cycle. For over 17% of participants, however, sharing poses the biggest challenge in the innovation cycle. Effectively disseminating results in a simple yet interesting way isn't always easy, especially without the right medium. Yet, even for those who have an appropriate medium, sharing can be daunting when the pilot has failed: "Unlike the private sector, failure can be challenging to admit, accept and share when acting as stewards of public dollars and working under officials often seeking re-election".

Sharing approaches helps others in their own discovery phases and is invaluable for mitigating the risk inherent in testing out a new idea. For these reasons, and to further cultivate a culture of innovation, it is as important to share challenges as it is to share successes. The political risk in sharing a failure reflects the benefit of piloting a solution before implementing it at scale.

> **"We share information on sharing sites for municipalities, but we rarely go beyond. It would multiply the value of the results if we communicated more."**
>
> Chief Technology Officer, City of greater than 100,000 inhabitants

Key Takeaways

At the outset of this project, we set out to learn more about the process-oriented building blocks that make innovation in urban areas tangible. The survey responses and subsequent interviews have helped us better understand many of the things we already suspected, and turned a number our assumptions on their head. After collating the data collected across various formats, we have landed on the following five key takeaways.

1. We are seeing a significant amount of reported success within an environment where there is a lack of clarity about how success can and should be defined. A number of survey and interview participants spoke about the difficulties inherent in standardizing measurement and evaluation for such a wide range of solutions. On the other hand, others shared positive experiences when project reporting was aligned with strategic planning.

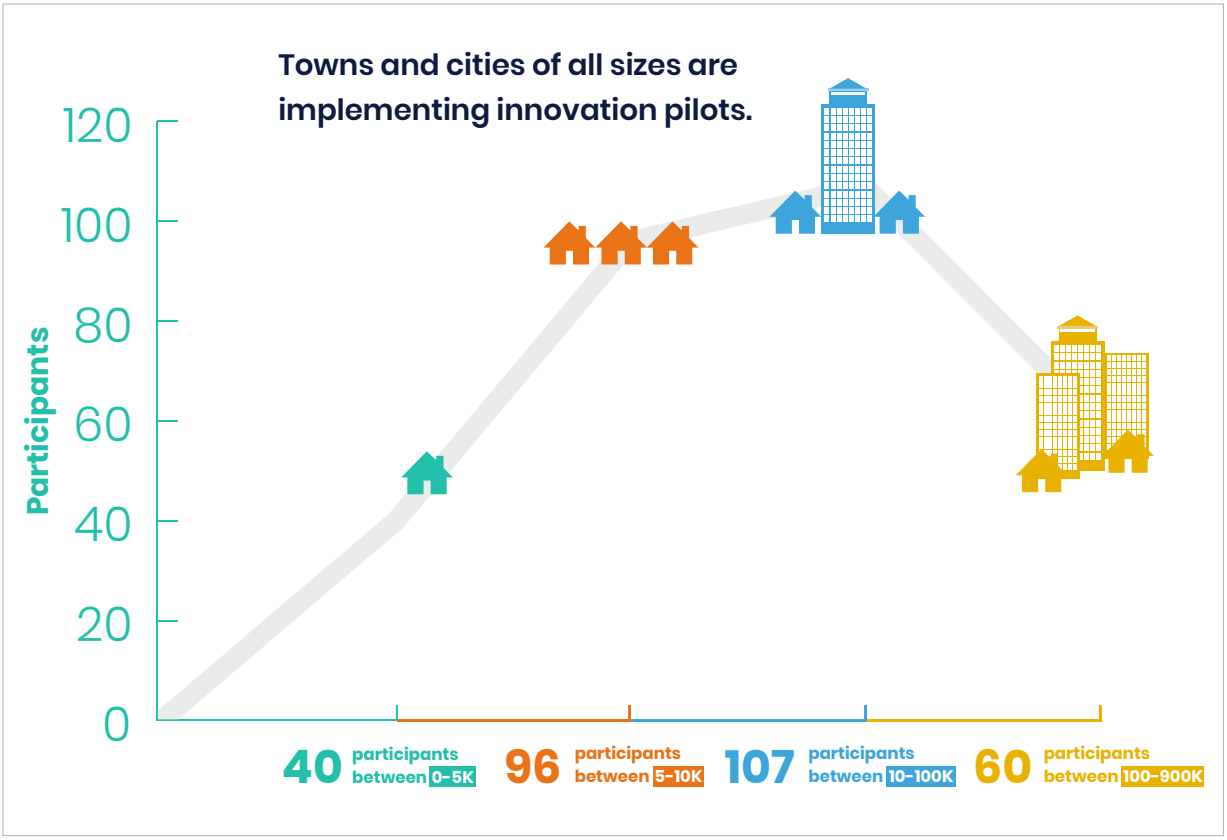
2. There appears to be broad adoption of the innovation life cycle model in places of all sizes, irrespective of budget. For some smaller communities, staffing and time limitations present a significant entry cost, making it impossible to engage in the innovation cycle. However, once this hurdle is jumped, the survey results indicate that having a comparatively smaller population is not in-and-of-itself a deterrent to innovation. Cities of all sizes are successfully innovating on a wide range of budgets, proving that this is not just the domain of large cities with equally large budgets.

3. Within public bodies, getting people to think "outside the box" and try new approaches remains very challenging and the inertia inherent in the "way things have always been done" is seen as being a deterrent to innovation. In response, many public bodies are trying to cultivate a culture of innovation wherein the innovation life cycle can flourish. Many survey participants spoke about how sharing honest results and experiences can both create a culture of innovation and make the discovery phase of the cycle much easier to navigate.

4. Strong project management is critical to success. It is integral to internal operations, particularly insofar as supporting buy-in for piloting new ideas and communicating with staff on

different teams. It is also vital for engaging with external stakeholders, the number of which increases with each innovation pilot as public bodies begin to target outcomes that require improved representation, such as equity and access.

5. A major trend to watch for is the move away from opportunistic innovation towards a more systemic approach. In the early days of innovation and smart cities, 'big bang' ideas of what a solution could deliver were widespread and many public bodies were willing to take a chance on a panacea. This has led to apprehension of what vendors can actually deliver, as well as tighter budgets when it comes to trying out new ideas. Our survey data indicates that innovation pilots are still increasing en masse. But for many public bodies, the next wave in urban innovation is more foundational in nature: data platforms and policies, standardized approaches to financing, platforms for discovering ideas and sharing results. The hope is that this systemic approach will mitigate risk and maximize reward.



Founded in 2010, NewCities is an international, independent nonprofit committed to shaping a better urban future. NewCities brings a 'whole-city' approach to our research and events - we convene and connect the key stakeholders of the urban ecosystem: the residents, governments, academic institutions, civil society organizations, and business communities of a city.

www.newcities.org

UrbanLeap

UrbanLeap is a San Francisco based startup committed to providing local and regional governments with the data, processes, and tools they need to discover and evaluate solutions to their toughest urban challenges. Our cloud based innovation management platform empowers cities to explore approaches and solutions, solicit ideas from the public and industry, pilot and test out those solutions prior to full-scale adoption, and share results with like-minded cities and municipalities. We are assisting over 45 local governments manage hundreds of innovation projects and deliver outcomes that matter - faster and with higher success rates.

www.urbanleap.io

CivicPulse

CivicPulse is a nonprofit organization dedicated to improving access to high quality information about local government. Founded in 2018, CivicPulse implements recurring national surveys of local government leaders across the United States. Through careful data analysis, reporting, and strategic partnerships, our mission is to provide trustworthy insights for policymakers, citizens, and other interested stakeholders in the broader civic community.

www.civicpulse.org

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