In the 2018 edition of the Sustainable Cities Index (SCI), we continue our exploration of the People, Profit and Planet dimensions of city sustainability to build a greater understanding of the underlying characteristics that enable some cities to outperform their peers.

Our intention is to initiate further debate on the nature of long-term success so that cities continue to challenge themselves to meet citizens’ present and future needs.

Human needs are fundamentally hierarchical in nature. And if certain needs are not met, for example if housing is too expensive, then dissatisfaction will follow. The SCI and other studies show that even highly developed cities can struggle to meet the basic needs of their citizens. As a result, the levels of people’s satisfaction associated with their purpose or well-being are undermined. For instance, a city might have a strong sustainability score, but if elevated levels of congestion prevent it from meeting accessibility needs, it is not truly sustainable from a citizen’s perspective.

This points to a series of core challenges for all cities that influence not only how they seek to improve their performance, but also how they prepare for a digitally-driven transformation. It is important to look at how cities maintain services at current levels as they evolve, specifically if they use innovation to ensure that currently recognized needs and wants are met. Also important is how cities allocate new resources to meet changing citizen requirements, and whether they’re prioritizing initiatives that deliver the greatest benefits. Finally, it’s critical for cities to ensure that they’re fit for the future. Preserving resources to meet the needs of tomorrow’s citizens and respond to changes in business models and economic circumstances is vital.

Peter Glus, Arcadis City Executive
The Sustainable Cities Index ranks 100 global cities (28 in North America) on three pillars of sustainability: People (social), Planet (environmental) and Profit (economic).

For the first time, the 2018 report seeks to complement this exploration by furthering the data with additional insight on sustainability from the citizen perspective.

The SCI overall findings highlight the following:

- The importance of the Profit pillar as a driver for long-term sustainability.
- The need for mid-ranking cities to improve their performance across all pillars.
- The growing potential for cities to use the digital evolution of their service provision to promote engagement with citizens and improve their experience.

New York City came out on top as North America’s most sustainable city in 2018, driven by particularly strong performance in the Profit sub-index. New York, San Francisco and Seattle are the only North American cities to make the global top 20.

Seattle stands out among its North American peers with high scores across all three pillars. While most North American cities show a balance across the sub-indexes, they also exhibit room for improvement for all three, pointing to broad challenges the cities face in improving their sustainability.

San Francisco sits atop the People pillar
Affordability of city life, access to public transport, and income inequality are the big swing variables for the People pillar. San Francisco’s strong showing in public transport and digital service puts them on top, followed closely by Seattle and Ottawa. Certain U.S. cities face specific problems that seem to inhibit progress in the People sub-index and impact quality of life, including high crime, low affordability, limited public transport and education. In these cities, enterprise and technology become the principle experiential touchpoints, perhaps reflecting a citizen experience that values innovation and commercial success highly.

New York City is first in Profit
High levels of economic development and a pro-business environment mean the scores of the 22 U.S. cities in the Index tend to primarily be driven by the Profit pillar. The top of the sub-index is dominated by global financial centers. New York, San Francisco and Boston lead the way, and are the only North American cities to score in the top 10 in the global rankings.

Cities at the bottom of this pillar are marred by poor economic development and employment scores, the two most critical values in determining overall Profit rankings.

Planet pillar shows mixed results for North American cities
North American cities tend to score below average for energy use, greenhouse gas emissions and green space. U.S. cities fare better in terms of waste and water management, however, due to nearly universal piped water supplies and recycling schemes. The two California cities, San Francisco and Los Angeles, have the highest recycling rates in the world, but they also have some of the highest exposure to natural disasters. Canada had a strong Planet sub-index showing, with Montreal ranked first followed by Ottawa, Toronto and Vancouver. New York is the top U.S. city at number five. Determinants of a high ranking include low carbon energy infrastructure and significant green spaces. The expanded 2018 Index also tracks investment in low carbon transport infrastructure, including bike sharing and electric vehicle incentives – highlighting the rapid adoption of these solutions in many cities.
City clusters: Explaining citizen experience trends

The research features new work on city archetypes and clusters aimed at connecting a city’s SCI ranking to its citizen experience. The Arcadis Citizen-centric Cities Framework perspective identifies seven core City Needs that a city should aim to fulfill in order for citizens to thrive: Basic Needs, Home, Infrastructure, Government, Purpose, Well-being and Play. Within the research, there are four consistent groups, or clusters, of cities. The four city clusters are based on an analysis of the citizen experiences of city living combined with the Index data. The city clusters are:

- **Balanced Innovators**: Three North American cities in the SCI fall into this cluster, where the key citizen experiences are convenience and security associated with Automation and Sensing and high quality of life. They are particularly strong in People and Profit sub-indexes.

- **Post-industrial Opportunists**: 21 North American cities in the SCI fall into this cluster, where citizen experiences supported by a growing role of technology are mostly positive but might potentially be undermined by the impact of automation on legacy employment. Typical strengths are aligned to the People and Planet sub-indexes. Most U.S. and Canadian cities examined for the global report belong to this cluster.

- **Evolutionary Cities**: Three North American cities in the SCI fall into this cluster, typically characterized as cities that are changing rapidly in response to new circumstances. These cities are particularly weak in the Profit pillar.

- **Fast-growing Megacities**: No North American cities in the SCI fall into this cluster, which is made up of cities in rapidly growing economies including China and India.

Canadian cities vary across sustainability sub-indexes

The five Canadian cities in the 2018 Index — Toronto, Ottawa, Vancouver, Montreal and Calgary — were generally consistent and all ranked within the top 40 cities worldwide. However, digging deeper into the sub-indexes highlights some contrasts among cities in the Great White North.

Four out of the five Canadian cities fell within the top 20 of Planet rankings, with Montreal breaking into the top 10. The country’s strengths within the Planet sub-index include air pollution, electric vehicle incentives, and natural disaster monitoring. Toronto and Montreal posted strong showings in the Planet categories while Calgary had notably lower scores, attributable to greenhouse gas emissions and bicycle infrastructure.

The Profit sub-index proved to be Canada’s greatest opportunity to improve city sustainability. All five cities scored well for ease of doing business but lacked in tourism and transportation infrastructure indicators.

Consistent low crime rates and strong health indicators boosted Canada’s scores in the People sub-index. Transport applications and digital capabilities, on the other hand, proved to be one of the greatest discrepancies among the five cities. Wi-Fi availability was also mixed, with Vancouver earning a perfect score while Ottawa and Calgary lagged.

The SCI findings for Canadian cities highlight the importance of the Profit pillar as a driver for long-term sustainability. There is growing potential for Canadian cities to use the digital evolution to engage with citizens and improve the citizen experience of city life.
Cities such as New York, San Francisco and Seattle represent the upper crust of American urban sustainability. These Balanced Innovators are economic influencers with firm identities rooted in profit and digitization, and their sustainability outlook is fairly bright.

But the bulk of North American cities cluster together as Post-industrial Opportunists. On a global sustainability scale, they sit in the middle of the pack. Although these cities tend to be relatively well-managed, their future sustainability is not assured.

Competition is brewing among these cities to drive change that attracts talent and businesses. Those that embrace citizen-centric techniques for developing their People, Profit and Planet pillars can steel themselves against the rigors ahead.

Navigating post-industrial opportunity

The citizen experience across these cities is generally good. But a rapidly changing world demands that they seize every opportunity to enhance sustainability for citizens. Failing to recognize or act on these trends could upend a city’s economy, sap investment opportunities, or repel new residents.

Waging the war for talent

A common concern for Post-industrial Opportunists is increasing dynamism. The war for talent is underway as cities fight to attract industry leaders to their city. Look no further than the competition for Amazon’s second U.S. headquarters to see the value cities place on being home to major corporate centers.

But overemphasizing economic aspects of a city can threaten work-life balance and community integration. Chicago, for example, leads the cluster in the Profit pillar but owns the worst work-life balance score.

That’s not to say these cities shouldn’t strive to become economic hubs, it’s that economic success doesn’t have to feel like hard work to citizens.

In comparing citizen experiences at the top of the Profit pillar to those at the bottom (across all clusters, not just Post-industrial Opportunists), business does not have a strong influence on the citizen experience. Instead of enterprise and commerce dominating the lives of people living in the top cities, citizens experience the impact of strong economic sustainability through technology and infrastructure.

Resilience through individuality

While shifting the paradigm toward greater sustainability is ideal, cities mustn’t lose their identity as they evolve. Given the potential pace of change and sense of dislocation in these cities, a coherent identity will give increasingly diverse and connected groups of citizens a bond to rally around.

A strong sense of self could help create a more resilient community that’s better equipped to bounce back from incidents like an economic recession, natural disaster, or terrorist attack.

What’s ahead for Post-industrial Opportunists?

The future sustainability of these cities is not assured, despite being well managed. Each will have to address underlying tensions affecting their resiliency. Failure to incorporate citizen-centric solutions could drive away the talented citizens and new investments vital to improving sustainability.

There’s no universal formula for success, but quality of life is a powerful indicator of progress. Sustainability plans should place a premium on socio-economic equality, strong community, and an appropriate work-life balance for citizens.
Collectively U.S. cities led the way in digital innovation, however results were mixed across the cluster. All the cities allow citizens to pay property taxes online, but scores divert from there. Houston has the best cost of broadband score, but it’s offset by weak free Wi-Fi availability. Conversely, Jacksonville, Philadelphia, Miami and Phoenix earned perfect scores on free Wi-Fi access but trail others in the cost of broadband category.

No matter where a city falls on the digital spectrum today, it’s imperative that they prioritize digitization as part of their long-term sustainability plans. Without it, cities will trail their peers in automation, mobility, data-tracking and other functions that can optimize city infrastructure.

These examples only scratch the surface when it comes to the vast digital opportunities and data that exist within cities. Leveraging innovative technologies customized for their city and citizens, efficiency improvements can help cities gather new insight into what it means to live and work in their community.

These digital rankings will continue to evolve as new technologies emerge and cities start proactively shaping new and more connected experiences for their residents.
Chicago is an economic powerhouse. But it must refine the Planet- and People-focused aspects of its citizen experience to create a more sustainable, competitive future.

**Citizen Experience**
Chicago shares a citizen experience similar to cities such as Los Angeles, Atlanta, Baltimore and Miami. Citizens’ experiences in these cities are supported by a growing role of technology and are mostly positive.

**People**
The People sub-index is Chicago’s greatest area for improvement
The Windy City offers residents relative affordability, decent education, and exceptional digital capabilities. It also boasts the second-highest cultural offerings score for its collection of notable attractions to visit, trailing only New York City.

Chicago's struggles with violent crime mars the citizen experience and drags down the city’s People score. Income inequality also plays a role, as do poor showings in work-life balance, public transport access, and even Wi-Fi availability. Each problem presents its own unique challenges that the city must address to bolster its sustainability.

**Planet**
Chicago sits right near the midpoint of the Planet sub-index
Chicago earns high marks for its substantial bicycle infrastructure network, tying eight other cities for the top score. It is also one of the few cities in the report to earn positive scores for negative carbon emissions technology, supporting The Chicago Climate Action Plan’s aim to achieve an 80 percent reduction below 1990 greenhouse gas emission levels by 2050.

Prioritizing efforts to add green spaces, reduce greenhouse gas emissions, manage waste, and address water and sanitation issues will be vital in creating a more sustainable environment for Chicagoans.

**Profit**
Chicago ranked 5th among U.S. cities in the Profit pillar
Home to a large, diverse economy, Chicago leverages strong connectivity and an ease of doing business into a position as a Profit leader. Its outstanding university technology research scores, fueled by some of America’s finest educational institutions, are second to none.

The city’s average economic development — Chicago trails 12 North American cities in this department — dims its long-term sustainability outlook. Transportation infrastructure and tourism scores didn’t fare extremely well either. Enhancing all three could put Chicago on the Profit podium in future reports.
Los Angeles is a top-10 performer in the Profit and People sub-indexes. Evolving its transit system and addressing environmental issues could ensure a more sustainable future.

**Citizen Experience**
Los Angeles shares a citizen experience similar to Chicago, Miami, Houston and Atlanta. Citizens’ experiences in these cities are supported by a growing role of technology and are mostly positive.

**People**
Los Angeles boasts affordability, but income inequality persists

Citizens enjoy relative affordability and decent health, crime, and cultural offering scores. Digital capabilities for transportation are strong and could be the key to improving mobility for Angelenos.

On the negative side, income inequality is evident among residents and access to public transportation services is subpar. Focusing on both will be critical to building a more sustainable future for the city.

**Planet**
The Planet sub-index is Los Angeles’ greatest area for improvement

L.A. sports a stellar waste management score thanks to one of the highest recycling rates in America. It has put incentives in place to encourage electric vehicle usage, supporting a decent greenhouse gas emissions level despite the city’s single-car culture.

The city’s Planet problems are manifold. Exposure to natural disasters such as droughts, earthquakes, and extreme temperature is exacerbated by inadequate natural disaster warning systems. Below-average scores in green space, air pollution, and water and sanitation drive L.A.’s Planet score further down the ranks.

**Profit**
L.A. is a venerable trade hub despite transport infrastructure issues

Visitors might be drawn to the glitz of the Hollywood hills, but industry leaders in manufacturing, tech, aerospace, and entertainment have made L.A. a permanent home. The city is an international trade hub thanks to the thriving Ports of Los Angeles and Long Beach. Beyond economic development, Los Angeles’ notable Profit ranking is propelled by university technology research, digital connectivity, and tourism.

L.A.’s Profit score is weighed down by poor employment numbers, but the transport infrastructure — which earned the second-worst score in North America — is equally culpable. City leaders hope that innovative transit plans centered on connected and autonomous vehicles will increase public transport use and encourage citizens to abandon single-car occupancy in the future.
The city that never sleeps is North America’s economic leader. Driven by a diverse, interconnected citizen experience, New York City draws business and tourism from across the globe.

Citizen Experience
New York shares a citizen experience similar to cities such as Boston, Seattle and San Francisco. These cities boast a high quality of life thanks to services and infrastructure that support convenience, security and connectiveness.

People
The city enjoys an excellent People score with room to improve
New Yorkers boast strong education, health, work-life balance, and cultural scores. The city is arguably the safest it’s been in decades, and its diversity creates robust cultural offerings. Digital capabilities, like public transit apps and Wi-Fi availability, underscore a digitally connected citizen experience.

The city’s economy is flourishing, but some citizens struggle with affordability and income inequality. Access to public transit could be improved, and its age dependency ratio indicates some financial stress between the workforce and dependents.

Planet
The Big Apple’s Planet score is best in the U.S. While the city is a bonafide concrete jungle, it prioritizes providing green spaces, quality air, and clean water for residents. Coupled with a strong bicycle infrastructure and electric vehicle incentives, these initiatives help make New York the top-ranking American city for the Planet pillar.

The city could stand to improve on its negative emissions technologies and natural disaster monitoring to push its Planet score past the Canadian cities atop the Planet sub-index.

Profit
New York paces North America in the Profit sub-index
Home to the world’s largest stock exchange, New York’s healthy economic development and unmatched ease of doing business scores bolster the city’s reputation as a global financial leader.

Digital innovation is also critical to the city’s Profit score. New York posted one of the top connectivity scores in North America, and the city’s top universities are global leaders in engineering and technology research.

New York has been striving for better public transit since the introduction of the El trains, and it’s still a challenge today. Traffic flows to the tune of 2.4 billion passenger trips per year; a better transit infrastructure could alleviate growing congestion problems and create better access for all residents.
San Francisco is a tech hub at the forefront of digital implementation. Its citizen experience wrests in the city’s automation capabilities and data-driven service economy.

**Citizen Experience**
San Francisco shares a citizen experience similar to cities such as Boston, New York City and Seattle. These cities boast a high quality of life thanks to services and infrastructure that support convenience, security and connectiveness.

**People**
The premier People city in North America, hands down
Emphasizing digital solutions and citizen-sourced data for improving quality of life makes San Francisco the leader in the People sub-index. Residents enjoy accessible public transportation solutions linked to mobile apps that allows them to easily assess, track, and pay for their transit options.

Mobility, critical to any city’s sustainability, is heartened by Silicon Valley’s dominant tech sector. Forward-thinking connected and autonomous vehicle technologies, such as remote operated shuttles and mobility as a service, are creating more efficient transportation options for citizens.

Low affordability and income inequality are the only marks against San Francisco’s People score. Closing the wage gap and addressing the cost of living issues could improve its global standing.

**Planet**
The City by the Bay must bolster its natural disaster monitoring
On one hand, San Francisco boasts one of the highest recycling rates in the world, clean air, and many electric vehicle initiatives. But the city is vulnerable to natural disasters, and it lacks adequate natural disaster monitoring and early warning systems considering its level of environmental exposure.

The city’s geography — rich with hills and steep inclines — isn’t bike friendly. Increasing green space around town could help offset the car-based culture and boost its Planet score going forward.

**Profit**
San Francisco’s tech-focused culture fuels a remarkable Profit score
Economic development and university technology research round out a strong Profit pillar for San Francisco. It’s a top-10 city across the globe, behind only New York in North America.

Addressing issues with homelessness could bolster San Francisco’s Profit score. Not only does it dampen employment scores, it hurts some aspects of tourism — especially for international visitors.
What do we mean by a citizen?

Citizen:
Noun. An inhabitant of a particular town or city

Derived from Anglo French citesein (city-dweller, town-dweller, citizen); a citizen is an inhabitant of a particular town or city.

Citizens belong to a community because they live in it and because they have rights, duties and responsibilities in that community.