Implementing Sustainable Development Goals Into City Plans *p.2*

Building an Equitable and Resilient Future *p.4*

The USA Sustainable Cities Initiative *p.33*

sustain

VOLUME 41
Fall/Winter 2020

Sustainable Solutions

A Brief Introduction to Sustainable Development Goals Created by the United Nations *p.9*

UofL CHRISTINA LEE BROWN ENVIROME INSTITUTE

Editor
Allan E. Dittmer

Assistant Editor
Lauren Beth Anderson

Design/Layout
Nick Dawson
Canon Solutions America
Design & Printing Services
University of Louisville

The Envirome Institute was created in June, 2018, within the University of Louisville to support and promote research on the impact of the environment on human health.

The Envirome Institute pioneers a new, interdependent vision of health, supports research on the effects of the environment on health, and promotes holistic scholarship, locally and globally. The envirome is the personal, social and natural environment that impacts human development, growth, and disease. Envirome provides an infrastructure for transdisciplinary knowledge, bridging academic research with community engagement.

The Enirome Institute, directed by Dr. Aruni Bhatnagar, brings together 9 centers including: Superfund Basic Research; Diabetes & Obesity; Healthy Air, Water & Soil; Integrative Environmental Health Science; Environmental & Occupational Health Science; Environmental Policy & Management; Kentucky Pollution Prevention; Environmental Engineering; and American Heart Association Tobacco Regulation & Addiction Center.

Sustain is published semi-annually by the:

Envirome Institute
Cardiovascular Institute
302 E. Muhammad Ali Blvd.
Louisville KY 40292

Send electronic correspondence to
Dr. Ted Smith, ted.smith@louisville.edu

This publication is printed on recycled paper.

For previous issues of Sustain Magazine, please visit: **partnershipgreencity.wixsite.com/greencitypartnership**
or
tinyurl.com/SustainLouisville

UNIVERSITY OF LOUISVILLE®
CHRISTINA LEE BROWN ENVIROME INSTITUTE

2 **Implementing Sustainable Development Goals Into City Plans**
Jeffrey Sachs
Caroline Fox

4 **Building an Equitable and Resilient Future**
Greg Fischer

8 **Responsibility and Opportunity: What it Means to be a Member of the United Nations Sustainable Development Solutions Network**
Neeli Bendapudi

9 **A Brief Introduction to Sustainable Development Goals Created by the United Nations**
Alake Myers

12 **2019 Cities Index**
Caroline Fox
Alainna Lynch

16 **University Partnerships and Local SDG Implementation**
Lauren Anderson

22 **Resilient Louisville – Aligning with Local Government and the United Nations**
Eric Friedlander
Betty J. Adkins

28 **A Pathway to Sustainable American Cities: A Guide to Implementing the SDGs**
Nilda Mesa
Melika Edquist
Jessica Espey

33 **The USA Sustainable Cities Initiative: Lessons for City-Level SDG Action (Sustainable Cities)**
Sandra Ruckstuhl
Jessica Espey
Leslie Rae

38 **Towards a Transdisciplinary Superfund Research Center at the University of Louisville**
Jamar M. Wheeler
Lauren C. Heberle

43 **Los Angeles Sustainable Development Goals A Voluntary Local Review of Progress 2019**
Eric Garcetti

Jeffrey Sachs

Implementing Sustainable Development Goals Into City Plans

Jeffrey Sachs
Director, SDSN
Director, Center for Sustainable Development, Columbia University

Caroline Fox
Head of SDSN USA

In times of crises, the United States has shown time and again that with dedicated and coordinated efforts we can solve tremendously complex problems. From landing a man on the moon, to building an interstate highway system, discovering many antibiotics, eradicating polio, inventing the Internet, and sequencing the human genome, public policies and private efforts have combined to make history. Sustainable development, the challenge of our time, requires nothing less, both by the US and globally. So far, we have lost time and ceded actions to other countries. Now is the time for the US at all levels, cities, states, and federal government, and all sectors, business, academia, and civil society, to step up the efforts!

Cities are at the forefront of this challenge. Eighty percent of Americans live in cities, and the quality of life in cities can swing the scale of progress on a range of sustainable development challenges. The UN's Sustainable Development Goals (SDGs), adopted by 193 countries and with an achievement timeline of 2030, offer a set of integrated objectives that cities should adopt, and many have done so. The SDGs are a blueprint for action for prosperous, inclusive, equitable, safe, and environmentally sustainable societies. SDG 11 specifically calls for making cities "inclusive, safe, resilient, and sustainable," and all of the 16 other SDGs contain targets and indicators that also must be addressed at the city level.

To their great credit, many cities are taking this challenge on in the US and around the world. They are integrating the SDGs into their sustainability plans, seeking to overcome data gaps for better monitoring and reporting, and are sharing lessons learned in an enlarging community of practice of cities around the world. By taking on the SDGs, mayors and local governments can connect their social, economic, and environmental efforts, break down administrative silos, and better serve their local residents. The SDGs are flexible; the goals can, and must, be customized and localized to local priorities and conditions. In the United States, New York and Los Angeles have released Voluntary Local Reviews to share their progress on the SDGs globally, and additional cities such as Orlando, Pittsburgh, and others are set to follow their lead. Los Angeles has an online data platform for the SDGs, and Hawaii's Aloha+ Challenge integrates the SDGs into local priorities in a statewide initiative and reports on them in real time.

At the Sustainable Development Solutions Network (SDSN), we endeavor to mobilize global scientific and technological expertise to promote practical solutions for sustainable development, including the implementation of the SDGs and the Paris Climate Agreement. Our members are mainly universities and think tanks, and our partners include businesses, governments, and civil-society organizations. The SDSN was founded in 2012 under the auspices of the UN Secretary-General to take on complex challenges and bring to bear expertise in economics and other disciplines to find workable solutions. The SDSN leads 33 regional and national networks around the world, with over

1,000 total members. The United States network, SDSN USA, was launched in December 2018 and includes over 115 members from 44 states, Washington DC, Puerto Rico and the Virgin Islands. With little federal-government activity on the SDGs, our universities, think tanks, businesses, civil society organizations, and individuals need to take action on the SDG agenda.

Universities can and should be in the forefront of this effort. Universities can provide the technical and scientific expertise to overcome gaps in knowledge; assist local, regional, and national planning and policymaking; and educate the leaders of tomorrow and the broad public on sustainable development. Universities should provide special briefings to the elected representatives of their district (local, state, and Congressional). Across the United States, there are countless examples of universities backstopping efforts of their local cities and communities, and seeking to build partnerships and dialogue.

Los Angeles, for example, has an official partnership with Occidental College to advance the Sustainable Development Goals. In Baltimore and San José, the University of Baltimore and San José State University, respectively, partnered with their cities to produce reports on the SDGs at the local level. Millersville University's website asks visitors "what problem will you solve?" and connects university programs of study to the SDGs. Other Universities are undertaking faculty surveys to better understand the landscape of SDG related work, as is illustrated in Yale University's recent report "Yale Scholarship and the Sustainable Development Goals."

In this issue of Sustain Magazine, the University of Louisville is bringing attention to the critical role universities can play to augment and support SDG research and action in the United States. We are most grateful to the University of Louisville for this great leadership. SDSN is thrilled to have SDSN's work on cities, universities, and the SDGs featured in this issue, and grateful for the expertise that the University of Louisville brings to the SDSN network.

The SDGs will be advanced notably by the important work of the University of Louisville. The Envirome Institute's commitment to sustainability, its work to localize the SDGs through action and research in Louisville, and its work to raise awareness and build dialogue around these important issues in the US is a powerful and inspiring demonstration of how universities everywhere can build on their expertise to increase the reach and impact of their research, teaching and policy advising.

Building an Equitable and Resilient Future

Mayor Greg Fischer
Louisville, Kentucky

Mayor Greg Fischer

The impact of global warming is no longer theoretical– it's a serious challenge we face every day. We're seeing increased rainfall that causes flooding, heatwaves that claim lives every summer, and reduced air quality that hinders human health, just to name a few. Our changing climate warrants an immediate, multidimensional response that meets our environmental and economic needs today while still ensuring sustainable future for generations to come.

In Louisville, we face several environmental challenges: a rapidly growing urban heat island, air quality issues (due to the Ohio River Valley's topography), and water quality concerns, specifically as it relates to the Ohio River.

That said, for Louisville, sustainability is about more than the environment — it's about building an equitable and resilient future. It's about the health of people in all areas of our city and the opportunity for everyone to reach their full human potential.

While the members of Louisville's industrial sector have made great strides to improve air quality, like cities across America, we're still dealing with a legacy of negative health outcomes, many of which are linked to living in proximity to industrial pollution. This contributes to health inequities in some neighborhoods, especially in west Louisville, including elevated cancer rates, asthma, breathing problems and lead exposure, as outlined in our Louisville Metro Health Equity Report 2017.

That is unacceptable. The ZIP code where someone is born should not be a predicter of their health. It's important that we acknowledge the connection between the quality of our air, water, soil, and built environment to our residents' health, and we must make sustainability a top priority for ensuring quality of life for everyone.

Metro Government faces this ongoing challenge in the context of an extremely tight city budget in FY20, as the result of an increasing state pension obligation and Metro Council's rejection of a new revenue stream. Going forward, we know that our pension obligation will increase by an estimated $10 million a year for at least four more years, requiring that we think seriously about our priorities and how best to address sustainability and resilience issues to ensure that our city can thrive and grow.

While we recognize that we have much more to do, we are proud of our achievements thus far.

Sustainability Accomplishments

Sustain Louisville, the city's first sustainability plan (released in 2013), laid out ambitious goals to make Louisville one of the nation's greenest and most environmentally friendly cities. This comprehensive sustainability plan focuses on six areas -- Energy, Environment, Transportation, Economy, Community and Engagement -- with 19 broad goals to chart a path to leave our Earth better than we found it.

With input from residents, community and business leaders, *Sustain Louisville* is our vision for a greener, healthier city. And we have made progress on many of its goals through initiatives such as the Cool Roof Rebate Program, the LouVelo bikeshare program, and the annual Sustainability Summit. In 2018, Louisville ranked 3rd in the nation for the most Energy Star certified buildings, and working with partners such as the Transit Authority of River City, our city now has 15 all-electric buses, the second largest all-electric fleet in the country.

In 2013, Louisville Metro worked with Johnson Controls on $27 million worth of energy upgrades and repairs to municipal-owned buildings. The project touches more than 200 buildings and includes water conservation efforts, lighting upgrades, HVAC upgrades, solar panels, and building management system controls to improve energy efficiency and sustainability in the city's buildings, libraries, and parks. In 2017-18, these improvements resulted in $1.9 million saved in energy costs and a CO^2 reduction of 14,765 tons, equivalent to taking 2,900 cars off the road.

In signing the Global Covenant of Mayors for Climate & Energy (GCoM), our city committed to reducing its contributions to climate change while preparing for the impacts of rising global temperatures and changing weather patterns. Louisville has completed a Greenhouse Gas Inventory, set a GHG reduction goal of 80 percent by 2050, and is currently working on an Emission Reduction Plan and a Climate Adaptation Plan. This commitment makes Louisville part of a global network of cities facing the same challenges, allowing us to act locally but connect globally.

In 2005, Louisville Metro Air Pollution Control District worked with local industry and the West Jefferson County Community Task Force (WJCCTF) to develop and implement the Strategic Toxic Air Reduction (STAR) program, after a 2000-01 report found unsafe levels of 18 toxic chemicals present in and around the Rubbertown industrial complex. In the 14 years since its adoption, the STAR program has led to a 26 percent decrease in overall air toxics, with some companies eliminating emissions of the most harmful pollutants. Louisville's STAR requirements are more stringent than federal EPA guidelines and have resulted in air quality improvements for our city.

While many cities feel the effects of higher temperatures due to the urban heat island (UHI) effect, Louisville's urban heat island is increasing more rapidly than most other U.S. cities, due in part to significant tree canopy losses – 54,000 trees each year -- and a concentration of impervious, heat-absorbing surfaces (Louisville Urban Heat Management Study 2016).

Louisville is addressing this challenge. After an in-depth tree canopy assessment in 2015, we released the *Urban Heat Management Study* with strategies to reduce the urban heat island effect. Since its release, we have increased tree-planting efforts, particularly in neighborhoods most impacted by high temperatures; the city and our partners have planted 100,765 trees across the city since 2011 (Division of Community Forestry).

We also incentivized installation of more than 600,000 square feet of cool roofs – with 60 percent of funding allocated to high-heat neighborhoods. And we established the Energy Project Assessment District, providing a financing mechanism to commercial property owners for energy efficiency and renewable energy upgrades.

Transportation contributes significantly to our greenhouse gas (GHG) emissions and is therefore an integral part of our sustainability strategy. The city's multi-modal transportation plan *MOVE Louisville* sets a goal of reducing vehicle miles traveled and prioritizes projects that provide options for commuting, recreation, and short trips using transit and active modes like biking, walking, and electric scooters.

Investing in multi-modal transportation not only reduces GHGs but also improves air quality and overall community health. Our first major *MOVE Louisville* investment was the New Dixie Highway project, which will introduce Louisville's first Bus Rapid Transit service later this year. This project will serve as a model for moving from car-centric solutions toward more sustainable travel for our community.

The project also sets out to make the sustainable and healthy choice for mobility an easier choice, with improved safety along a corridor that has a fatality rate three times that of other Kentucky highways of similar size and traffic count.

Sustainability as a Core Principle

In 2013, Louisvillians embarked on *Vision Louisville*, a city-wide initiative that brought private enterprise, community and governmental organizations, nonprofits, cultural institutions, and citizens together to define the future look, feel, and flow of our city through the perspective of our built environment.

This broad ranging, engaged, creative process inspired big ideas, and through more than 80,000 comments, themes emerged: connectivity, creativity, economy, energy, health, living, and identity.

Key ideas submitted included better bike and pedestrian infrastructure, multi-modal hubs and better transit, diversified energy sources, green practices to reduce the UHI, improving air quality, building complete streets, and enhancing green spaces and recreational opportunities.

Residents also called for equitable access to healthy activities. One way we have met this challenge is our work building on recommendations of the 2013 Louisville Loop Master Plan. Metro has provided funding to construct a 43 percent expansion -- an additional 15.35 miles -- of the Louisville Loop, which, when complete, will be a 100-plus-mile multi-use trail encircling the city.

Importantly, we used *Vision Louisville* as we updated Louisville's Comprehensive Plan, the 20-year strategic plan for the city's built environment. Using the themes from Vision, we developed the CHASE principles -- Connectivity, Health, Authenticity, Sustainability, and Equity -- to inform every aspect of the comprehensive plan and as a guide to direct future development and investment.

Incorporating sustainability as a core principle means that decisions about economic development, mobility, and housing will include a review of environmental impacts and encourage green practices.

Ensuring a Resilient Louisville

In 2016, the Rockefeller Foundation invited Louisville to join its global network of 100 Resilient Cities to increase the capacity of our community to survive, adapt, and grow in the face of a changing climate. This effort complements our commitment to compassion and equity, since climate change most directly impacts communities that have the least capacity to address it.

In Louisville, we know that west Louisville neighborhoods suffer the most from the urban heat island (Louisville Urban Heat Management Report), air quality issues (Louisville Metro Health Equity Report), and lack green spaces that improve health outcomes (West Louisville Outdoor Recreation Initiative Master Plan).

Preparing our city for the challenges of climate change means building resilience in our people and neighborhoods, as well as developing policy to mitigate its effects. So *Resilient Louisville,* the plan developed as a result of our partnership with 100 Resilient Cities*,* lays out a vision for our future with four goals to build resilience in our community:

- Embrace life-long learning,
- Ensure a safe and healthy city,
- Build a vibrant economy and place, and
- Maximize innovation and civic engagement.

Through robust community engagement, this plan reflects residents' concerns and ambitions and builds on the work being done not only by city government but by our local nonprofits, advocacy groups, institutions, and concerned residents.

To further build human resilience, the plan sets goals to ensure inclusive economic growth in historically marginalized communities, increase opportunities for economic mobility, and build on our cultural assets. *Resilient Louisville* also sets goals to cultivate social-change agents and foster community cohesion in order to be transparent and empower the work many are already doing to address these challenges.

For example, our Give a Day Week of Service annually brings together thousands of volunteers to work on projects that improve our environment and help neighbors. Since appointing a Chief Equity Officer, Louisville has trained city employees on implicit bias and racial equity in order to provide more inclusive services to all residents. And Louisville has been recognized as one of the top four cities in America by the What Works Cities initiative for its transparency, performance improvement, and innovation, which builds trust with community and allows for better delivery of services.

Looking forward, priorities include advancing trauma-informed care to improve education and health outcomes for children, adopting an environmental justice policy for the city, and continuing to work toward our citywide renewable energy goals are all steps that will increase our resilience and improve the quality of life for all residents.

Louisville's investment in affordable, energy-efficient housing through the Louisville Affordable Housing Trust Fund (LAHTF) and Creating Affordable Residences for Economic Success (CARES) ensures that residents making 80 percent or less of area median income have safe, sustainable housing in areas across the community. Louisville Metro Housing Authority developments such as Sheppard Square and Liberty Green have incorporated solar energy, green infrastructure, and energy-efficiency in order to provide sustainable housing options for all residents.

Resilient Louisville not only aligns with the Mayor's Strategic Plan but also supports the United Nations Sustainable Development Goals (UNSDG), which promote sustainable, inclusive and equitable growth, reduce inequalities, raise basic standards of living, foster equitable social development and inclusion, and promote integrated and sustainable management of the environment.

The Future of Sustainability in Louisville

Efforts to support sustainability, access to green space, and environmental education are taking place in many Metro agencies.

Metro Parks and Recreation, for example, is providing equitable access with investments like upgrades to California and Victory parks. The West Louisville Outdoor Recreation Initiative will bring much needed outdoor activities and a state-of-the-art facility to Shawnee Park. These projects not only encourage use of the parks but also improve our community's health and set up career pathways in park management, environmental education, and recreation for young people.

Recently, oversight of Louisville's sustainability efforts has been moved to the Office of Advanced Planning. The renamed Office of Advanced Planning and Sustainability will engage the community to develop and implement long-range solutions to create a vibrant, sustainable community.

Advanced Planning creates and implements strategic, long- and short-term planning initiatives focused on neighborhoods, multi-modal corridors, brownfields, and public art. Incorporating sustainability in this office further ensures that green practices are integrated into all planning efforts, and our city develops in an environmentally sustainable way.

We aspire to a future that is sustainable, equitable, and inclusive. Like every American city, we still have much work to do to realize our dreams, and every day, we strive to be better, do better, and make a better future for everyone.

At the same time, we also must be clear eyed about the extensive need for more resources to do much of our sustainability work. We must decide as a community what our future budget priorities should be – and how we'll pay for those priorities, including necessary upgrades to MSD's aging sewer infrastructure and treatment capabilities, which will require an investment of several billion dollars.

I am proud of the work the city has done and all we've achieved, yet we must do more, and that means working harder, thinking bigger and embracing innovation and collaboration to achieve sustainability, which is essential for the future of Louisville.

My team and I are committed to continuing our sustainability endeavors and making Louisville a place where everyone has the opportunity to reach their full human potential in a clean, green, safe, healthy and compassionate city.

Responsibility and Opportunity: What it Means to be a Member of the United Nations Sustainable Development Solutions Network

Neeli Bendapudi, Ph.D.
President, University of Louisville

Neeli Bendapudi

Among the most important goals of any university are those that enable our faculty and our students to build a better future, to improve our communities and to contribute to a better world. One of the most important ways we can achieve those goals is by protecting and enhancing the health of our planet.

As I announced at the 2018 Louisville Sustainability Summit held at the University of Louisville last fall, the UofL Christina Lee Brown Envirome Institute was honored to join the United Nations Sustainable Development Solutions Network (SDSN) as a founding member of the U.S. Solutions Network. This membership carries both a great responsibility and a great opportunity for our university. Members of the SDSN must have a deep expertise in one or more areas related to sustainable development and commit a substantial amount of work to finding solutions for problems in sustainable development.

At the University of Louisville, we have done just that.

The University of Louisville has committed to the health of our planet by offering degree programs in sustainability, implementing sustainable campus operations, engaging members of the community and conducting research to discover new sustainability solutions. Our research includes work being done in UofL's Christina Lee Brown Envirome Institute to understand the many ways the environment affects human health, as well as in the Department of Urban and Public Affairs, in the Conn Center for Renewable Energy Research and elsewhere.

By participating in this global network, UofL faculty members exchange ideas with other experts in this emerging field and contribute to local and global sustainability efforts.

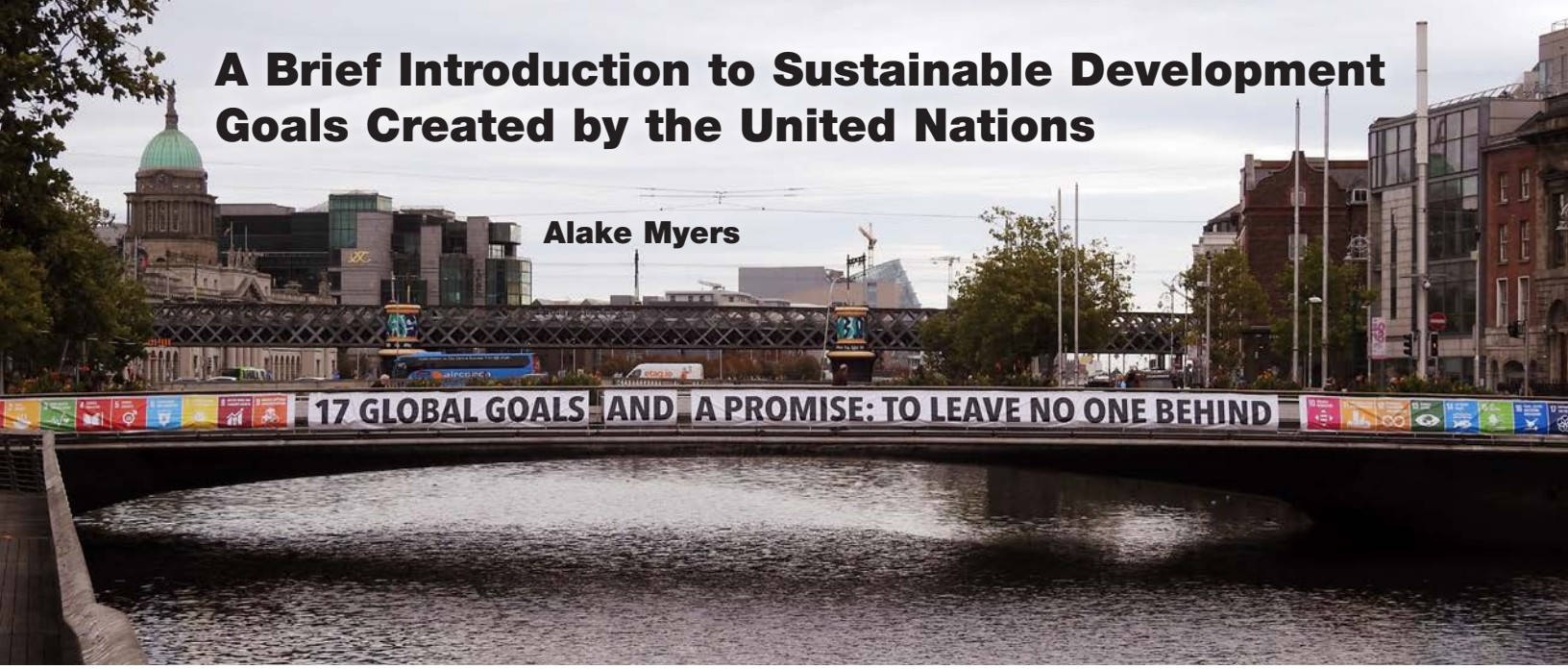
In addition to joining a prestigious cohort of organizations in the SDSN, UofL is one of 13 universities selected to pilot the SDSN's Sustainable Development Goals Academy. The SDG Academy is a free online educational platform for the 17 Sustainable Development Goals for people, prosperity and the planet adopted by member states of the United Nations.

Starting in Fall 2019, students in UofL's interdisciplinary Masters in Sustainability program will be able to take graduate-level online courses through SDG Academy led by the world's foremost experts on issues integral to sustainability including health, education, climate change, agriculture, food systems, sustainable investment and others. The fully interactive platform allows students the chance to meet, debate and learn in a global classroom.

The collaborations brought about by our participation in the SDSN and the SDG Academy magnify the ability of our faculty, staff and students to help solve the environmental issues facing human populations around the world. Please join me in celebrating UofL's participation in the SDSN in this issue of *Sustain*!

A Brief Introduction to Sustainable Development Goals Created by the United Nations

Alake Myers



In current efforts to address global dilemmas, the Sustainable Development Goals were created by the United Nations General Assembly in 2015. They provide a proposal for all cooperating countries from around the globe to ambitiously tackle several of the World's most pressing and leading issues by 2030. This proposal is referred to as the 2030 Agenda for Sustainable Development. With the oversight of the United Nations, cooperating countries are tasked to adhere to a list of goals they share in a vision of ending poverty, making sure that everyone has an opportunity to prosper, and defending the "health" of the planet. Each goal branches off into 169 objectives, or targets that should be accomplished within the following 15 years. These targets were formed to examine the progress towards completing each goal.

The Sustainable Development Goals focus on aiding all people who do not have the essential necessities of life and face a variety of inequalities that render them helpless. In tandem, these goals were established to enhance the lives of everyone, now and future generations to come. One of the key features of the Sustainable Development Goals is to find ways to protect the environment and maintain the "health" of the planet. To further elaborate, scientists have linked the "health" of the planet directly to the progression of climate change. These goals offer a progressive approach to combat the effects of climate change.

There are a total of 17 Sustainable Development Goals. Each goal clearly identifies an issue and then, proceeds to define it using statistical data that is used for others to better grasp the gravity of the issue at hand. All in all, these goals were constructed to encourage "dignity", "peace", and "prosperity" for everyone in the world:

Goal 1: No Poverty

Poverty comes in multiple forms. Poverty is a state of being deficient in social and economic resources. It is also the lack of obtaining the basic needs of life, education, exercising civil rights, etc. After the year 2000, the rate of global poverty has reduced by half. However, in developing countries, there are regions where there are millions of people who are living on less than $1.90 US per day. Obtaining economic stability and growth are vital for the wellbeing of the citizens who are often afflicted with natural or manmade disasters.

Goal 2: Zero Hunger

When making sure that everyone has enough to eat, food resources must be cultivated, distributed, and consumed responsibly. A successful operation that supports and regulates agriculture, forestry, and seafood markets can supply nourishing food for multitudes of people. It can generate business opportunities for individuals in rural areas as well. The number of climate change related calamities have increased. Thus, they are threatening resources that are neccesary to maintain the health of the population. The depletion of nutrient rich soil, fresh water, clean oceans, healthy forests, and the decrease in biodiversity are issues that must be addressed.

Goal 3: Good Health and Well-Being

Reducing morbidity and mortality rates through effective healthcare related campaigns and initiatives promote healthier lives for individuals. Decreasing maternal deaths will indirectly decrease child mortality. The objective for this goal in the 2030 Agenda for Sustainable Development is to reduce the maternal mortality rate to less than 70 maternal deaths per 100,000 live births. Improving health care systems, increasing access to health care facilities, reducing environmental pollution, etc. are just a few methods to increase the life expectancy of millions of individuals from around the globe.

Goal 4: Quality Education

Quality education is one of the cornerstones of developing sustainable development. Quality education must offer more than basic literacy skills, an objective in past years. It must strive to

offer universal education that can improve fundamental reading and math skills. The inclusion of more girls and women students is a priority to increase diversity and improve equality in the classroom.

Goal 5: Gender Equality

Taking drastic, yet, necessary measures to continue to improve the lives of women is vital. Women are often subject to violence and discrimination all over the world. To make sure that women have and maintain their basic human rights, they must be offered economic incentives, employment, and better social opportunities. Quality education, improved work environments, and political involvement are three ways to prevent women from being disenfranchised. Strongly endorsing women's empowerment will decrease the number of women who suffer from physical, sexual, and domestic violence.

Goal 6: Clean Water and Sanitation

In developing countries, waterborne illnesses arise from local water sources that have not been properly sanitized increases the danger of the health and wellness of the individuals who must rely upon contaminated water as their sole resource. This is particularly detrimental to the health of children and infants who have undeveloped immune systems that cannot properly respond to these types of infections. Lack of hygiene education, sanitation resources and technologies exacerbate this problem in areas that are prone to having habitual droughts and financial insecurities. Establishing facilities that offer water sanitation services and health education while increasing access to freshwater to more than 2 billion people who are at risk for consuming unsanitary water is essential to solve this problem.

Goal 7: Affordable and Clean Energy

Supplying energy to everyone in the world is a difficult tasks to accomplish. It has been estimated that there are more than a billion people who do not have access to electricity. Approximately, half of those individuals live in Sub-Saharan Africa. 3 billion people are exposed to an energy source that increases their contact with harmful levels of air pollution. It is predicted that investing in renewable energy resources that are deemed "clean" is a way that will stimulate economic growth, offer employment opportunities, and form a proper response to complex environmental problems such as climate change.

Goal 8: Decent Work and Economic Growth

Unemployment is a problem that needs sound resolutions. The Global unemployment rate is 5.7 %. Approximately, 50% of the World's population maintains their livelihood on an estimate of US $2 per day. The belief that obtaining employment ensures that one will rise from poverty is simply not the case. Meaningful jobs that boost the economy and produce safe and clean working environments must be created.

Goal 9: Industry, Innovation and Infrastructure

Supporting and making practical investments in infrastructures that support safe transportation, clean energy, advancements in communication and information technology, etc. are instrumental in the development of communities in several different countries. These would empower them to enhance their productivity, generate incomes, and increase the availability of health and education facilities.

Goal 10: Equality

Socioeconomic disparities decrease the availability of education and health care opportunities and increase inequality in countries that are less developed. Environmental, social, and economic development are the three crucial ways to foster economic expansion. They can better aid populations that are disadvantaged such as landlocked countries that rely mainly on external resources.

Goal 11: Sustainable Cities

The number of people in cities will grow to approximately 5 billion by 2030. Therefore, proper preparation for this population growth is important as cities become further developed and land and resources will have to be shared with more people. Advanced sanitation facilities and environmental protection programs will become instrumental in maintaining the cleanliness of these cities.

Goal 12: Responsible Consumption and Production

The use of resources such as energy, fresh water, and food sources that supply nutrient rich foods must be consumed efficiently. This is to make certain that everyone will have access to these vital resources. Pollution is a byproduct of material use of these resources. All forms of it will be injurious to human life and the earth.

Goal 13: Climate Action

Every country on the seven continents are experiencing the destructive effects of climate change. It is negatively altering the weather patterns, increasing the sea levels, and increasing the number of natural disasters. Greenhouse gas emissions are historically at an all-time high. The temperature of the surface of the world is increasing. Consequently, this will have a catastrophic effect on the ecosystem and will disrupt and tremendously reduce the quantity and quality of fundamental resources.

Goal 14: Life Below Water

Every living organism needs water to live. The oceans of the world provide water to every ecosystem on the planet both directly and indirectly. They contain sea life that is a vital food resource for humans and other landbound organisms. Transit by ship on the open waters is still one of the main methods goods are traded

from one country to another. The quality of ocean water is being diminished by pollution that causes it to be acidic.

Goal 15: Life on Land

30 percent of the surface of the earth is covered with forest. Forests offer shelter to a plethora of organisms and indigenous populations. Thus, they safeguard biodiversity. Forests can prevent the manifestations of climate change. Deforestation destroys the natural protections offered by forest and other vegetation. Approximately 13 million hectares of forest are demolished every year.

Goal 16: Peace, Justice, and String Institutions

Worldwide homicide cases and human trafficking are two of numerous threats against peace that greatly impede sustainable development goals from being achieved. Policies that provide effective regulations can be used to restore basic human rights to the vulnerable and protect the welfare of children against such repulsive acts of violence.

Goal 17: Partnerships

It will take enormous effort from multiple parties to improve the quality of human lives. The 2030 Agenda for Sustainable Development fervently encourages all public and private sectors, communities, and governments from all over the world and at every level to communicate and work together in efforts to solve these problems.

Finally, it is not difficult to foresee that as the population increases, more natural resources will be used to support the growth of the population. As a result, those resources will have to be fairly allocated to safeguard the welfare of everyone. This is what makes the Sustainable Development Goals invaluable as a global endeavor. They will establish and fortify human-rights protections and sustain justice and equality for everyone.

Citations

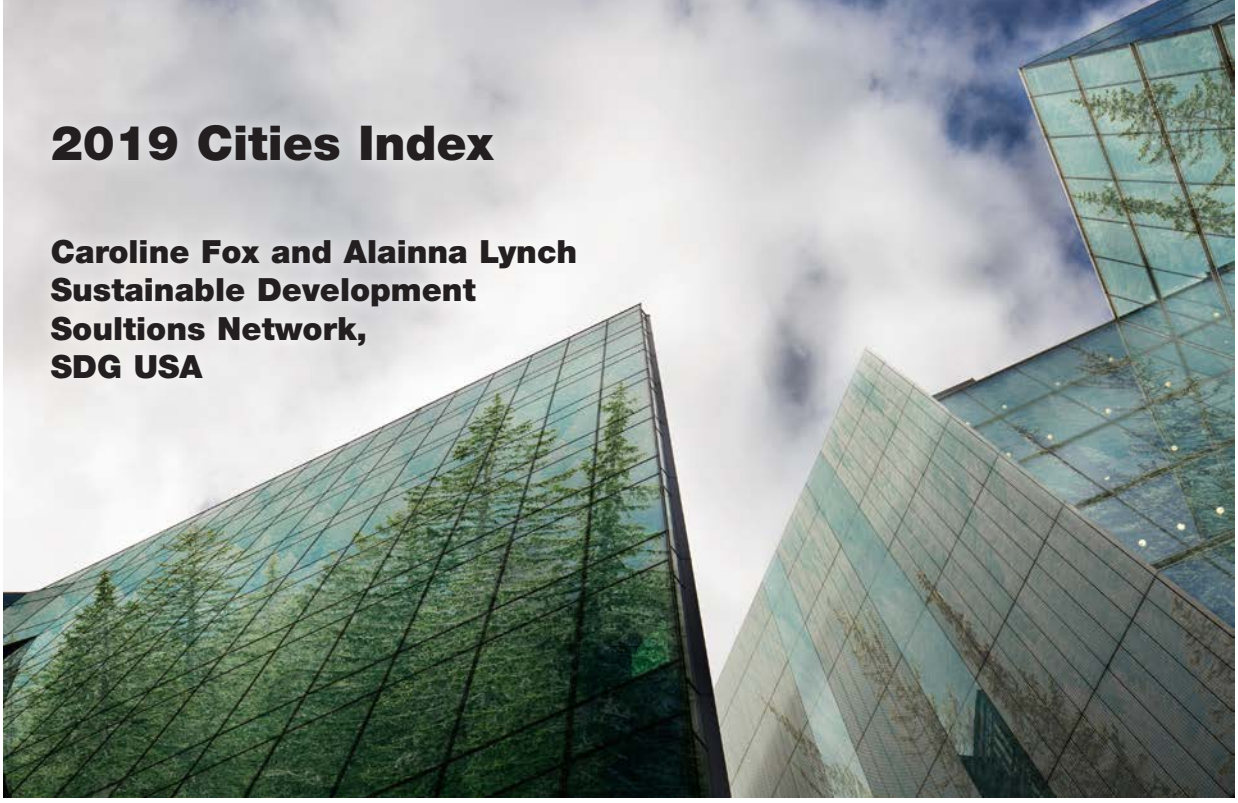
About the Sustainable Development Goals - United Nations Sustainable Development. (n.d.).

Retrieved from http://www.un.org/sustainabledevelopment/sustainable-development-goals/.

The Sustainable Development Agenda - United Nations Sustainable Development. (n.d.). Retrieved from http://www.un.org/sustainabledevelopment/development-agenda/.

Why Sustainable Development Goals Are Important. (n.d.). Retrieved from http://www.raptim.org/why-sustainable-development-goals-are-important/.

Why the SDGs Matter - United Nations Sustainable Development. (n.d.). Retrieved from http://www.un.org/sustainabledevelopment/why-the-sdgs-matter/.



2019 Cities Index

Caroline Fox and Alainna Lynch
Sustainable Development Soultions Network, SDG USA

Introduction

Currently, more than half of the world's population lives in urban areas, and the number is rising ("World Urbanization Prospects: The 2018 Revision" 2018). As urban populations rise, so must services expand, jobs be created, and resilient infrastructure be built, updated, and maintained. Cities can be hubs for sustainability, adaptation, and resiliency. A well-designed urban center can both inspire and improve the lives of its residents, while a poorly planned or managed city can degrade not only its residents' quality of life, but also undercut the natural and social systems that underpin it.

Cities around the world are rapidly changing. Climate change, growing populations, demographic shifts, and other factors have resulted in challenges to the status quo and provide opportunities for innovative problem-solving. Home to most of the world's residents and producing more than 70% of the world's carbon emissions, change at the city level will be essential for achieving the SDGs by 2030 ("Consumption-Based GH Emissions of C40 Cities" 2018; Leahy 2018; Markolf et al. 2017). This holds true in the United States, where many cities have experienced the impacts of stronger weather events, life expectancy is declining amidst a public health crisis of opioid addiction (in contrast to increasing life expectancy in other OECD countries), and, where even in the densest areas, residents rely on cars as their main mode of transit to-and-from work (OECD n.d.).

To address these worrisome trends, stakeholders across all levels of government and in all sectors of society must build long-term strategies towards a more sustainable future. The Sustainable Development Goals (SDGs) offer a framework for us to use as a blueprint for the path forward. As the experiences of the first cities to adopt the SDGs are shared, and practical resources expand—such as the index below, SDSN's *A Pathway to Sustainable American Cities: A Guide to Implementing the SDGs*, the SDG Academy's *Sustainable Cities Massive Open Online Course*, the TReNDS network's *From Progress to Promotion: How Sub-national Data Efforts Support SDG Achievement* —it is clear that progress, feasibility and momentum are quickly scaling up as well (SDG academy n.d.; TReNDS 2019; Mesa, Edquist, and Espey 2019). Other organizations, such as the Global Economy

A Pathway to Sustainable American Cities: A Guide to Implementing the SDGs

and Development Program at Brookings Institute, Hawaii Green Growth, and Carnegie Mellon's Heinz College of Information Systems and Public Policy are engaging across stakeholder groups of students, businesses, city officials, and others to foster dialogue towards tackling some of the largest monitoring, reporting and policy barriers towards SDG attainment.

The SDGs focus closely on local, community-driven change and on putting the welfare of those with the least, first. With those priorities in mind, sub-national reporting such as this city-level Report provide context for communities to focus on progress closest to home, and offer a tool to support community members who are advocating for positive change where they live (Sachs et al. 2018). This report and index offer an analysis of progress and opportunities in US cities towards achievement of these SDGs. There is much progress to be made in US cities if the SDGs are to be achieved by 2030. It will require both localized action that is aligned with specific needs and challenges, as well as a networked approach, where communities and organizations such as SDSN USA can rely on each other to share lessons, practices, resources and inspiration. This guide offers a starting point to both parts, and places cities into a larger context to support coordinated action.

FIGURE 1: OVERVIEW OF RESULTS

100	0 cities scored 100
69.7	Best score on index, San Francisco-Oakland-Hayward, CA
48.9	Average score
40	11 cities score 40 or less
30.3	Worst score on index, Baton Rouge, LA
0	101 cities scored 0 on at least one indicator

Source: SDSN USA analysis of results

How are US Cities Doing?

The 2019 US Cities Sustainable Development Report shows that none of the United States' largest metro areas have overall "good performance" on the SDGs. The best performing cities are 60-70% of the way to achievement, and the worst performing cities are only 30-40% of the way there. The next ten years are crucial for cities if they are to achieve the SDGs. Indeed, as so much of the population lives in metro areas in the US, progress in cities will be essential for the US as a nation to achieve the SDGs. In a similar vein, the strengths and lessons developed by a city could be applicable to not only regional partners, but communities of all different sizes, both locally and globally.

Using 57 indicators across 15 Goals, this report provides a window into SDG achievement overall, illuminates gaps and successes, and makes comparisons across the country's largest urban areas. Overall, the results of this report demonstrate that cities in the United States are about halfway towards achieving the SDGs. Beyond that, only nine of the 105 MSAs included in this report score above sixty percent, a barely passing grade in most academic programs. This report also highlights a call to action in communities around the US. Whether it be to customize these results to local communities, advocate for change based on these results, or work to fill in data gaps (table below), the SDGs and this Report are a starting point for community-led action.

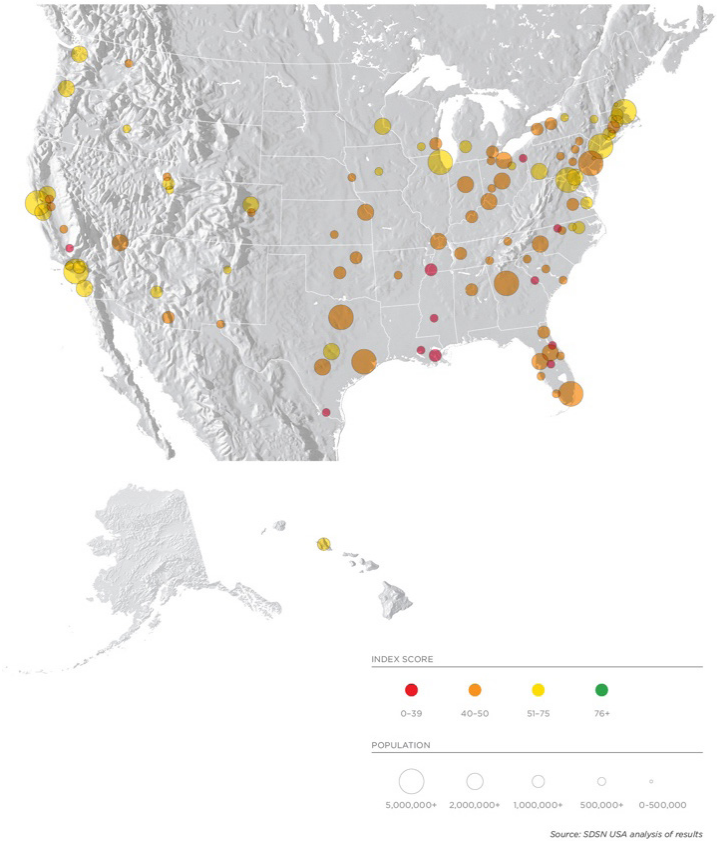
The 2019 US Cities Sustainable Development Report generates 7 main findings:

1. None of the most populous US cities currently show good performance on the Goals for 2030.

FIGURE 2: DASHBOARD

MSA	INDEX RANK	INDEX SCORE
San Francisco-Oakland-Hayward, CA	1	69.7
San Jose-Sunnyvale-Santa Clara, CA	2	67.9
Washington-Arlington-Alexandria, DC-VA-MD-WV	3	66.7
Seattle-Tacoma-Bellevue, WA	4	66.0
Madison, WI	5	65.9
Portland-Vancouver-Hillsboro, OR-WA	6	65.6
San Diego-Carlsbad, CA	7	63.2
Boston-Cambridge-Newton, MA-NH	8	62.8
Austin-Round Rock, TX	9	61.8
Raleigh, NC	10	59.2
Albany-Schenectady-Troy, NY	11	59.1
Urban Honolulu, HI	12	58.2
Minneapolis-St. Paul-Bloomington, MN-WI	13	58.0
Bridgeport-Stamford-Norwalk, CT	14	58.0
Des Moines-West Des Moines, IA	15	57.7
Oxnard-Thousand Oaks-Ventura, CA	16	57.4
New York-Newark-Jersey City, NY-NJ-PA	17	57.3
Worcester, MA-CT	18	57.0
Los Angeles-Long Beach-Anaheim, CA	19	55.9
Providence-Warwick, RI-MA	20	55.7

FIGURE 3: MAP OF MSAs AND PERFORMANCE



Source: SDSN USA analysis of results

2. Localization is key – communities will need to customize data and action to their local context to successfully move towards SDG achievement.

3. There are pernicious inequalities that need to be addressed, and improvements on sustainable transit, rent affordability, and energy transition are sorely needed.

4. Improved data is required, most urgently on maternal mortality rates. Localizing the goals to specific communities may help fill some data gaps.

5. Compared to the "2019 SDG Index and Dashboards Report: European Cities", EU cities are generally outperforming US cities, in some cases with the US lagging seriously behind, like infant mortality rate, where the US average (6.5) is more than 2 times higher than the EU average (2.93), and gender wage gap, where the average gap in the US (27.3) is over 3 times larger than the average EU gap (8.79). On some Goals, most notably 12 and 13, both the US cities and EU cities have quite a bit of progress to make.

6. Best performing city overall is San Francisco-Oakland-Hayward, California and worst, on average, is Baton Rouge, Louisiana.

TABLE 6: DATA GAPS

SDG 1: END POVERTY
- Deep poverty
- Living wage
- Disability poverty gap

SDG 2: ZERO HUNGER
- Urban agriculture
- Investment in rural infrastructure
- Land access for Indigenous Peoples

SDG 3: GOOD HEALTH AND WELL-BEING
- Maternal mortality
- Access to high quality, comprehensive, health care
- HIV/AIDS
- Sexual and reproductive healthcare
- Prenatal care
- Universal health care tracer index
- Environmental health
- Smoking

SDG 4: QUALITY EDUCATION
- Affordable education
- Literacy
- Psychosocial wellbeing for youth
- Gender disparities in education
- Education for sustainable development
- Safe and inclusive learning environments
- Double segregation by race and economic status in schooling

SDG 5: GENDER EQUALITY
- Domestic workers/temporary workers
- Trafficking
- Family planning needs met
- Disparity in access to economic resources
- Sexual violence

SDG 6: CLEAN WATER AND SANITATION
- Water affordability
- Access to sanitation
- Wastewater
- Water-related ecosystems

SDG 7: AFFORDABLE AND CLEAN ENERGY
- Energy access
- Energy efficiency
- Research/investment in energy technology

SDG 8: DECENT WORK AND ECONOMIC GROWTH
- Sustainable tourism
- Migrant workers
- Forced labor and modern slavery
- Decoupling economic growth from environmental degradation
- Banking access

SDG 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE
- Sustainable infrastructure
- R&D investment
- Access of small businesses to affordable credit

SDG 10: REDUCED INEQUALITIES
- Migration policies
- Religious discrimination
- Regulation of global financial markets
- Disability

SDG 11: SUSTAINABLE CITIES AND COMMUNITIES
- Affordable transportation
- Cultural and natural heritage
- Disability access
- Urban displacement
- Rural/urban linkages
- Homelessness

SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION
- Food and municipal waste
- Corporate sustainability
- Sustainable public procurement
- Fossil fuel subsidies
- Carbon intensity of fuels

SDG 13: CLIMATE ACTION
- Climate finance
- Climate change education
- Climate planning support for developing countries
- Natural disaster resilience

SDG 14: LIFE BELOW WATER
- Not included

SDG 15: LIFE ON LAND
- Freshwater, forest, and mountain ecosystems
- Biodiversity/threatened species
- Genetic resources
- Wildlife poaching/trafficking
- Conservation funding

SDG 16: PEACE, JUSTICE AND STRONG INSTITUTIONS
- Violence against children
- Illicit financial and arms flows
- Corruption
- Access to information
- Voting

SDG 17: PARTNERSHIPS FOR THE GOALS
- Not included

7. The Goals with the most overall progress made to date are Goal 6: Clean Water and Sanitation, and Goal 15: Life on Land, and the Goals with the least progress made are Goal 7: Affordable and Clean Energy and Goal 2: Zero Hunger.

Call to Action – DATA GAPS

Though every attempt was made to cover issues urgent and central to the SDGs, there were many areas where data was not available or not comprehensive enough to be included. A partial list of gaps is below (Table 6: Data Gaps). One of the most striking gaps is maternal mortality, where there are not only difficulties of data standardization but also of reporting and aggregation (Merelli 2017; MacDorman et al. 2016; "U.S. Has The Worst Rate Of Maternal Deaths In The Developed World" 2017; Truschel and Novoa 2018). Because maternal mortality rates in the US are appallingly high for black mothers (42.8) — more than 2.5 times higher than high-income country averages (16.9) —city data on maternal mortality is especially relevant for achieving the SDGs in US cities (Rabin 2019; Kassebaum et al. 2016). Other notable gaps include Goal 14: Oceans, and Goal 17: Partnerships for the Goals. These Goals were not included due to methodological difficulties developing consistent measurements across city contexts.

We hope to include these Goals and indicators in future editions. If you or your organization has data, is conducting research on these topics, or if you have suggestions on how we might cover these gaps in future editions, please let us know at usa@unsdsn.org.

Conclusion

The 2019 US Cities Report provides an entry point into the United Nations' Sustainable Development Goals at the city-level in the United States. As was shown in the 2017 and 2018 Reports before it, cities have much to do if they are to achieve the SDGs by 2030. To date, cities have made the most progress on Goals 6: Clean Water and Sanitation, and 15: Life on Land and will need to do the most work on Goals 2: Zero Hunger, 5: Gender Equality, 7: Affordable and Clean Energy, and 9: Industry, Innovation and Infrastructure. In particular, cities will need to address economic, racial, and gender inequality; find clean energy solutions; provide sustainable transit options; and ensure equitable access to housing. While a comprehensive assessment of all SDG indicators is not yet possible, progress on Youth Out of School and Out of Work indicator, for example, is encouraging. Further, while all cities will need to improve in some areas, US cities are far from monolithic. No city is immune from the challenges of sustainable development, yet US cities have a wide variety of challenges and strengths: even within individual states, cities have a wide variety of outcomes. Localizing the Goals to specific communities will be central to their achievement in cities, and in the US in general.

Beyond an overview of progress towards the SDGs at the city-level, this report can point to areas for prioritization, collaboration, and further research. In connection with the State and Global Reports, the results can be put in a larger context and highlight areas of collaboration outside of traditional city networks by region and size. These are opportunities not only for cities to learn from what has worked elsewhere, but also to share with a wider audience the successes and lessons it has developed. Achieving the SDGs will require focused, intentional action that centers its solutions around the most impacted communities in devising solutions. This work extends beyond the limitations of any one administration or political party. The SDGs collaborative, international framework is an opportunity to bridge those limitations and move citizen-led initiatives towards implementation.

University Partnerships and Local SDG Implementation

Lauren Anderson, MPA, PMP

In December 2018, the University of Louisville and Louisville Metro Government's Department of Community Services and Resilience were honored to attend the launch of the Sustainable Development Solutions (SDSN) USA Network. Of the 113 unique organizations that have signed on to be in the founding group of the US Network, 78 members are colleges and universities from 40 states, US territories, and Washington DC spanning from Alaska to the Virgin Islands. While sustainable development practices are implemented by municipalities through the Sustainable Development Goals (SDGs), universities are uniquely positioned to help cities form localized solutions. Therefore, it is critical for universities to partner with local governments and communities to guide cities towards implementation of SDG practices and policies that are based on research and evidence.

There are many ways for universities to engage with the SDGs from acting as a repository of existing knowledge and a hub for knowledge creation to evaluating impact and fostering innovative collaborations. Universities can take on a unique role in city partnerships by using their academic expertise to identify, guide, and evaluate potential and implemented sustainable development solutions. However, all of this is in addition to the regular responsibilities university staff have to educate students, conduct research, and share findings through scholarly writing. To balance the equation and to help make a case for universities to actively partner with cities in SDG implementation, the SDSN Australia/Pacific Network has mapped the benefits such partnerships offer to Universities. Through SDG research, implementation, and guidance universities can demonstrate impact to potential students and funders, create innovative partnerships, access new funding streams, and contribute to the betterment of a global society (Mead, 2017). *Getting Started with the SDGs in Universities* guide maps out the mutual benefits of universities that take on SDG implementation, see Figure 1.

In addition to helping build the case for university action around the SDGs, the Australia/Pacific Network is finding methods for universities to operationalize and actualize SDGs. This is of special importance because in addition to guiding cities towards best practices in SDG implementation, universities must also lead by example. By implementing SDGs at the university level, city governments can learn from their model and test potential solutions before scaling up to the city level.

Nine universities in the Australia/Pacific region have agreed to the University Commitment to the Sustainable Development Goals. By signing the commitment, these nine universities recognize their responsibilities in addressing critical global challenges; to lead by example and ensure that university operations model the kind of innovation that is promoted by the SDGs; to equip the next generation of leaders with the knowledge to understand global challenges, and to identify sustainable social, economic, environmental and technical solutions through research (SDSN Australia/Pacific 2019).

Using University Operations to Lead by Example

Universities are trusted with the creation and dissemination of knowledge. Industry, regulatory agencies, and media all depend on universities as a trusted source of information. They are uniquely positioned to promote adoption of the SDGs because they offer education, research, information, and leadership to multiple sectors of stakeholders from students and city residents to elected local and state officials. Therefore, universities should lead by example by adopting SDG policies, practices, and targets into their research, governance and operations. Figure 2 below provides examples of how universities can contribute to the SDGs through their internal operations.

Universities are often major employers, consumers, investors, and real estate holders within their communities. Their staff, students, and contractors can make up a large swath of a city's population and play a significant role in shaping the sustainability agenda for city leaders and planners. Campuses can function like and be the size of small cities. They can create a significant flow of people and goods that support the local economies. As a result, universities can impact each SDG and use their weight within their communities to further the reach beyond campus (Australia/Pacific, 2017).

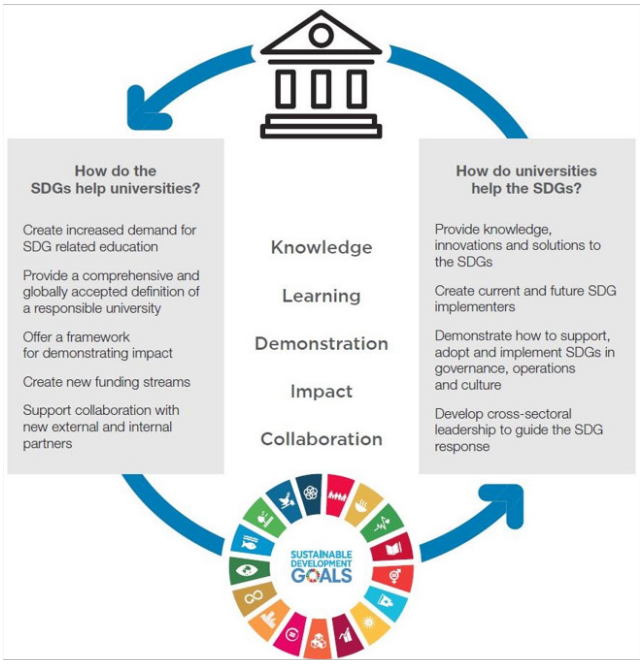
Creating Demand
As governments and societies adopt SDGs as a strategic focus, the demand for graduates who understand and can implement the SDG agenda will grow.

Responsible & Globally Aware
Universities are re-thinking their role and looking to be responsive to societal needs and to become agents of change towards solving global challenges. As a universally agreed framework, the SDGs provide an organizing structure for what this looks like for a university.

Demonstrating Impact
The SDGs provide a way to communicate and demonstrate how universities contribute to global and local wellbeing.

Accessing new funding streams
Global funders are increasingly framing funding calls around the achievement of the SDGs.

Supporting Collaboration
The SDG agenda provides a common framework for different sectors and organizations to work together on shared interests. This creates opportunities for new collaborations with government, industry, and citizen scientists. The framework also provides areas of common interests, helping to drive transdisciplinary partnerships, collaboration, and innovation.



Knowledge & Solutions
Implementing the SDGs will require new knowledge, new ways of doing things, hard choices between competing options, and in some cases profound transformations. Universities drive technological and societal progress through research, discovery, knowledge creation, and adoption. They attract and nurture talent and creativity and are central players in regional and national innovation systems.

Creating SDG implementers
Universities provide people with professional and personal skills and capabilities. Universities equip current and future leaders, decision-makers, teachers, innovators, entrepreneurs, and citizens with the knowledge, skills and motivation that will help them contribute to achieving the SDGs.

Demonstrating SDGs Through Governance & Culture
Universities have significant social, economic, and environmental footprints. By implementing the principles of the SDGs, universities can promote SDG achievement within their extensive sphere of influence.

Developing Cross-sectional Leadership
Universities are trusted by their communities. Therefore, they have the capacity and responsibility to guide stakeholders towards transdisciplinary collaborations that further the SDG mission.

Figure 1. The case for university engagement in the SDGs. Adapted from "Getting started with the SDGs in universities" by SDSN Australia/Pacific, 2017.

Universities can set an example for cities to follow by;

1. Implementing SDGs through operational policies and governance,
2. Promoting diversity within research and academic fields,
3. Facilitating transdisciplinary dialogue and action around the intersectionality of health, medicine, sustainable development, and urban design,
4. Providing accessible, affordable and inclusive education to all who have the desire to learn,
5. Equipping residents with the knowledge, skills, and motivation to research, advocate, and implement the SDGs,
6. Providing evidence-based methods and innovative technology to support SDG implementation,
7. Engaging the public in conversations about SDG rationale, benefits, and implementation,
8. Collaborating with innovators to design and implement SDG solutions, and
9. Guiding stakeholders like city leaders, developers, and local innovators to implement sustainable development solutions through research and expertise.

Many universities are already undertaking action in the first five areas of contribution listed above. However, as stated in the SDSN Australia's guide (2017), "for the SDGs to be truly successful at a global scale, universities need to become champions of sustainable development and play a leading role in the implementation of the SDGs." The last four areas of contribution listed above require that universities extend beyond their campus boundaries to engage in city-wide efforts that encourage the adoption of SDGs and sustainable development practices.

Educating the Next Generation of Urban Leaders

Perhaps one of the best ways universities can contribute towards the achievement of the SDGs and the global issues they address is through educating the next generation of world leaders. In order for the SDGs to gain more traction, leaders of the future require cross-cutting skills such as systems and strategic

Goal	Examples of actions
1 NO POVERTY	• Ensuring Fair Trade and ethical supply chains • Investment policies that promote Environment, Social and Governance (ESG) principles • Providing support structures for students living in poverty, such as scholarships and assistance packages
2 ZERO HUNGER	• Providing sustainable, nutritious and affordable food choices on campus • Facilitating food production on campus • Offering fresh food markets on campus • Introducing measures to reduce food waste on campus
3 GOOD HEALTH AND WELL-BEING	• Providing access to affordable health and wellbeing services on campus • Providing wellbeing programs for staff and students to reduce incidence of non-communicable diseases and promote mental health • Implementing 'no smoking' policies on campuses • Ensuring appropriate practices are in place for dealing with hazardous substances
4 QUALITY EDUCATION	• Supporting vulnerable and disadvantaged people to access and participate fully in the university, including persons with disabilities, indigenous peoples, and people experiencing financial difficulty • Providing programs to enhance literacy and education in communities and schools in the university's local area and beyond • Providing facilities that promote and encourage inclusivity in learning
5 GENDER EQUALITY	• Implementing workplace gender equity strategies, including those for improving the representation of women in university leadership positions and senior academic roles • Working to close the gender pay gap • Providing childcare on campus and promoting workplace flexibility • Participating in national campaigns for preventing violence against women and committing to report on the number of sexual assaults that have taken place at the institution

Figure 2. Examples of actions universities can take to contribute to the SDGs through their internal operations. From "Getting started with the SDGs in universities" by SDSN Australia/Pacific, 2017.

thinking, integrated problem-solving, and normative philosophy, entrepreneurship, and partnership competencies (Australia/Pacific, 2017).

Education plays a crucial role in urban planning at the local level and the SDG framework should be integrated into urban development curriculums to ensure the creation of sustainable cities. SDG education prepares learners to contribute to SDG achievement by equipping them with the knowledge and competencies to transform their communities into sustainable cities (UNESCO, 2017). Universities or individual faculty members and students can incorporate SDG-framed learning objectives into curriculum. For example, SDG 11, Sustainable Cities and Communities aims to make all cities and human settlements inclusive, safe, resilient, and sustainable. To incorporate SDG 11 into curriculum and student learning, a 2016 UNESCO report SDG Education recommends several learning objectives, topics and approaches. See Table 1.

- **Target 11.1:** By 2030, ensure access for all to adequate, safe and affordable housing and basic services,
- **Target 11.2:** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport,
- **Target 11.6:** By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, and
- **Target 11.7:** By 2030, provide universal access to safe, inclusive and accessible, green and public spaces.

SDG 11 incorporates a wide variety of targets under one single goal. In addition to the targets listed above, SDG 11 also touches on disaster response, social inclusion, and regional planning. The SDSN often calls for action from every sector because of the varied nature of the seventeen SGDs and the 169 targets contained within them. This message also sets an example for how universities can train their students to perform on cross-sector and multidisciplinary teams for SDG achievement. For example, in Kentucky, the University of Louisville has convened urban affairs, communication, public health, sociology, and medical students in a transdisciplinary research partnership for the Green Heart project. This project, within the Christina Lee Brown Envirome Institute, will address SDG 11, Target 11.7 to test a green infrastructure intervention for improvements in social cohesion, health outcomes, resilience, biodiversity, and other metrics. Projects like these serve not only to improve city infrastructure, policy, and the lives of community members, but also demonstrate community involvement on the part of both the city and the university, commitment to improvement, and can yield more engaged residents and appetite for further sustainability work.

One of the ways that the SDSN is facilitating uptake of sustainable development curriculum towards specialized, cross-cutting skills and the learning objectives above is through the SDG's Academy University Partner Program (UPP). Because the SDSN US Network is newly established, very few universities have the experience and resources necessary to educate students about all seventeen goals and strategies to accomplish them. To support education for sustainable development, the UPP provides resources such as teaching guides, tool kits, and best practice manuals from the world's leading experts on sustainable development. Within the first year of joining the US Network, the University of Louisville is honored to join the SDG Academy's

Table 1. Learning Objectives for SDG 11. Adapted from "Getting started with the SDGs in universities" by UNESCO, 2017.

SDG 11 Learning Objectives	
Cognitive learning objectives	Understanding of basic physical, social and psychological human needs and can identify how those basic needs are addressed in their community.
	Ability to evaluate a community's food, energy, transport, water, safety, waste treatment, inclusion and accessibility, education, green spaces, and risk reduction systems.
	Understanding of the need to balance innovations towards sustainable systems while maintaining a sense of place and while respecting cultural heritage.
	Understanding of the basic principles of sustainable planning and building and ability to identify opportunities for improvement.
	Understanding of political and cultural landscape, the role participatory governance, and how to interact within the public policy system.
Social and emotional learning objectives	Ability to identify collaboration points and methods to participation for advocacy for sustainable policies, practices, and infrastructure in their community.
	Ability to connect with and support community groups in developing a sustainable future vision for their community.
	Understanding of the roles that the natural, social, and personal environments have had in building their community's identity, health, and culture.
	Ability to feel responsible for the environmental and social impacts of their own individual lifestyle.
Behavioral learning objectives	Ability to plan, implement and evaluate community-based sustainability projects.
	Ability to participate in and influence decision processes about their community.
	Ability to advocate for or dissent against decisions, policies, and practices in their community.
	Ability to co-create in inclusive, collaborative group that spans disciplines and sectors to identify and implement sustainable solutions.

UPP network and to offer SDG related coursework in the fall 2019 semester. While university faculty have the expertise to support SDG education through additional assessments, experience, and local case studies, the course modules and tools offered by the UPP are necessary to create independent study opportunities for SDG education for graduate level urban studies programs. Participation in the SDG Academy's partnership is one of the first steps universities can take to begin educating the next generation of urban planners in sustainability practices – benefitting not only their communities but the entire SDSN network.

Connecting Education and Urban Development

Education influences how a city is designed and built and impacts a city's future trajectory. Quality education leads to significant benefits for individuals, communities, and cities such as creating a skilled workforce to support strong economies, improved population health outcomes, and greater resilience from disaster events and stresses (UNESCO, 2014). Beyond the benefits of a well-educated citizenry, universities have a special role to provide knowledge and evidence from research to support progress towards achieving the SDGs (Australia/ Pacific, 2017). Through transdisciplinary, collaborative research projects students, community members, and city officials can work together to create reality-tested solutions to global challenges.

Universities can take specific actions to build stronger relationships between their education and research activities and city decisions and planning. See Table 2 below for examples of what universities can do. Table 2. How Can University Leadership Can Guide Urban Design. Adapted from "Getting started with the SDGs in universities" by SDSN Australia/ Pacific, 2017.

Provide Leadership

To achieve the SDGs, communities must acknowledge their unique complex social, economic, and environmental relationships. No matter the size or location of a community, achieving sustainability will require transformations in how communities function and how its residents interact as a society. Because universities are often knowledgeable about the structures, systems, and histories of the communities, researchers are in a unique position to identify the best testing grounds to build evidence for successfully implementing SDGs.

By design, communities large and small can localize SDG solutions. For example, SDG 3, Good Health and Wellbeing targets include;

- Target 3.a: Create framework convention on tobacco control and
- Target 3.6: Reduce death and injuries from road traffic accidents.

Table 2. How University Leadership Can Guide Urban Design. Adaped from *Getting started with the SDGs in universities* by SDSN Australia/Pacific, 2017.

Activity	Methods	
Provide leadership for sustainable policy development	Partner with policy makers to identify problems and potential solutions, test options, and evaluate success	Develop guidance and advocacy platforms that are based on realities and evidence to guide political conversation and action
Lead by example in SDG commitment	Support the implementation of the SDGs within the university through teaching, research, and operations	Participate in activities that demonstrate the benefits and importance of SDGs implementation
Strengthen public participation	Engage the community in lifelong learning to increase awareness and knowledge of the SDGs and their relevance within localities	Facilitate transdisciplinary collaborations to achieve evidence-based action and innovation to improve urban conditions

Purdue University and the University of Illinois at Champaign are both located in communities with less than 100,000 residents. Columbia and Brown Universities are both located in New York City which supports a population of over 8 million people. These three vastly different locations require different strategies to successfully address tobacco control and roadway safety. The research teams at each of the universities are uniquely suited to inform what those localized solutions are because of historical work and their position within those communities. University faculty and leadership should be well connected with local urban planners, community groups, and elected officials who can help inform the structure and methods employed by the strategies.

Lead by Example

University-based research drives development of social and technological innovations and solutions. Universities receive research funding to develop, pilot, and engage with communities with an eye to scale up potential interventions to increase sustainability (Australia/Pacific, 2017). This activity can serve to drive markets, generate consumer awareness and demand, and yields innovations for all sectors. When cities can sign on as partners to university research, it sends a strong signal that local governments are not only committed to supporting the university institution, but also to improving conditions within their cities through thoughtful, evidence-based methods. All parties benefit from such collaborations and each partners' expertise. Collaborative projects are hubs for creativity and innovation that other cities and universities can learn from. Through sustainable learning environments, socially inclusive policies, and a global-citizen mindset, educators, students, and the public can begin to see how sustainable practices can be integrated into the fabric of the city for the good of all (UNESCO, 2016).

Strengthen Public Participation

Universities must build strong advocacy and leadership relationships within their communities in order to engender change towards sustainable practices. One way to foster these types of relationships is for universities to take on deeper involvement in city initiatives and processes. Universities should introduce both faculty and students to city leaders and should encourage participation in the city's decision making processes such as budget and policy hearings. Beyond acting as gatekeepers to municipal processes and empowering students to use their voice in advocating for innovative change, universities hold a unique position in their communities because of the perception that they are unbiased creators of knowledge. This position makes universities, their faculty and students, well-suited to provide facts and rationale to guide city decisions (SDSN Australia/Pacific 2017).

Education stakeholders, community leaders, and elected officials must create learning to career pipelines in order to gain the full benefit of having a university as a part of the city's landscape. Stronger bonds between universities, municipalities, and communities will ensure that education and lifelong learning not only will always be a part of city discussions, but will also benefit cities by keeping trained talent within their urban limits. Education encourages productivity and innovation in cities, and can transform them into knowledge economies. Education and lifelong learning need to be integrated in urban planning to take advantage of their positive effects on cities in economic and social terms (UNESCO 2017).

Conclusion

- Universities have an opportunity
- Have a duty to act for the benefit that they can provide
- Responsibility
- Call to action

Cities and the universities within them are inextricably linked. While sustainable development practices are mostly implemented by municipalities, universities are uniquely positioned to help cities form and test localized solutions. Universities play key roles in identifying, vetting, informing, and evaluating potential policy decisions and community-level interventions. Universities can expand SDG implementation within cities leading by example, guiding current and future leaders through education, and support action and interventions through research (Australia/Pacific, 2017). Further, given the complex nature of urban planning, design, and policy, education and lifelong learning must be integrated into a city's systems.

References

Mead, Leila. (2017). Reports Focus on Role of Universities in Achieving SDGs. International Institute for Sustainable Development. Accessed 7/2/19 via http://sdg.iisd.org/news/reports-focus-on-role-of-universities-in-achieving-sdgs/.

SDSN Australia/Pacific. (2017). A new guide aims to help universities accelerate action on the SDGs. Sustainable Development Solutions Network – Australia/Pacific, Melbourne. Accessed 7/2/2019 via http://ap-unsdsn.org/a-new-guide-for-universities-on-the-sdgs/.

SDSN Australia/Pacific. (2017). Getting started with the SDGs in universities: A guide for universities, higher education institutions, and the academic sector. Australia, New Zealand and Pacific Edition. Sustainable Development Solutions Network – Australia/Pacific, Melbourne. Accessed 7/2/2019 via http://ap-unsdsn.org/regional-initiatives/universities-sdgs/university-sdg-guide/.

SDSN Australia/Pacific. (2019). University Commitment to the Sustainable Development Goals. Sustainable Development Solutions Network – Australia/Pacific, Melbourne. Accessed 7/2/2019 via http://ap-unsdsn.org/regional-initiatives/universities-sdgs/university-commitment/.

United Nations Educational, Scientific and Cultural Organization (UNESCO) 2014, Sustainable development begins with education, UNESCO, Paris, unesdoc.unesco.org/images/0023/002305/230508e.pdf

UNESCO. (2016). Education for people and planet: Creating sustainable futures for all: New Global

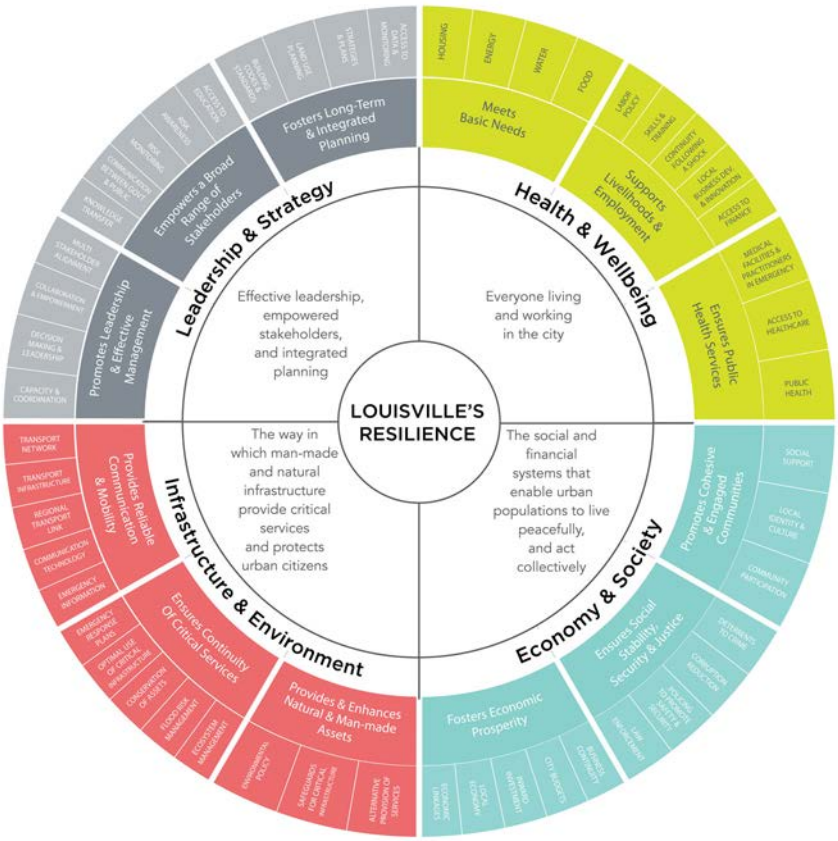
Education Monitoring Report Series. UNESCO, Paris. Accessed 7/10/2019 via https://en.unesco.org/gem-report/report/2016/education-people-and-planet-creating-sustainable-futures-all.

UNESCO. (2017). Education for Sustainable Development Goals: Learning objectives, UNESCO, Paris. Accessed 7/8/19 via https://unesdoc.unesco.org/ark:/48223/pf0000247444.

Resilient Louisville – Aligning with Local Government and the United Nations

Eric Friedlander, Louisville Metro Chief Resilience Officer

Betty J. (BJ) Adkins, Louisville Metro Community Resource Development Director



R=E+C+T is the intersection where our community's resilience is built upon the foundation of equity, compassion and trust and how our community and local government align with the charge of the United Nations.

Introduction

The Resilient Louisville team worked within the 100 Resilient Cities (100RC) premise that *urban resilience is the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what type of chronic stresses and acute shocks they experience*.[1] Our multi-year journey began in May 2016 when 100RC selected Louisville to be a member city in its international network of cities – a network where cities around the world form a learning collaborative recognizing each city's respective uniqueness and common attributes. In Louisville, stakeholders (Community Voices) identified our city's acute shocks and chronic stresses; that is, Louisville's propensity toward acute events that significantly impact a city (shocks) and the chronic conditions that weaken the fabric of a city overtime (stresses). This undertaking was designed to provide multiple modes of community engagement activities that culminated in Louisville's 2019 Resilient Louisville Strategy Document – a document that ties together the community's voices, the Louisville Metro Strategic Plan, and the United Nations Sustainable Development Goals.

Community Voices

18 Core Team Members
38 Steering Committee Members
1,720 Workshop Attendees
55 Individuals Interviewed
883 Survey Respondents
357 Focus Group Participants
114 Working Group Members

The City Resilience Framework. 100RC set the framework providing a method and common language for all selected cities to operate based upon four essential dimensions: Leadership & Strategy: (1) promotes leadership & effective management, (2) empowers a broad range of stakeholders, and (3) fosters long-term & integrated planning; Health & Well-being: (1) meets basic needs, (2) supports livelihoods & employment, and (3) ensures public health services; Economic & Society: (1) fosters economic prosperity, (2) ensures social stability, security & justice, and (3) promotes cohesive & engaged communities; and Infrastructure & Environment: (1) provides reliable communication & mobility; (2) ensures continuity of critical services, and (3) provides & enhances natural & man-made assets. These dimensions formed the basis of the Agenda Setting Workshop attended by 200 people followed by the two-year, two-phase process that intentionally evolved based upon the direction provided by the community's diverse voices, skills, and expertise. The participants included Louisville residents, leaders, advocates, students, subject-matter experts, and representatives of neighborhoods, businesses, non-profits, faith-based organizations, universities, government and other non-government organizations.

The Process

The 100RC efforts are divided into a series of phases: Pre-Phase, Phase I, Phase II, and Phase III. The Pre-Phase, Phase I and Phase II required a milestone product that summarized

Caption: The Louisville Resilience Steering Committee meeting at Chef Space. *Photo credit: Louisville Metro Government*

outcomes and approval by 100RC before advancing through the work: Preliminary Resilience Assessment, Customized City Approach, and the Resilient Louisville Strategy Document (SD). The SD is a culmination of the work and leads to Phase III: implementation of the actions in the multi-year strategy plan. During these phases, Louisville's 17-member Core Working Team – representing a dedicated and diverse cross-section of Louisville Metro departments, agencies and perspectives – met weekly to plan meetings, structure all activities, complete required inventories, establish the stakeholder engagement plan, and analyze data. The Resilient Louisville Steering Committee formed to be the governing body that provided resources, expertise and formal decision-making support throughout Phase I and Phase II. Louisville is unique among most of the cities in the network. Normally a steering committee is comprised of government officials and top leaders in a community. Louisville took a different approach. The steering committee had no government representation and rather than the usual leaders, we asked these leaders to recommend others for this steering committee. As such, this made for a broader array of voices and perspectives that led the Louisville Resilience process. The committee participated in exercises and activities providing vital input into the process with all groups developing an understanding of the City Resilience Framework.

Louisville's Chief Resilience Officer (CRO) convened the community and openly invited all residents into the conversation.

The Pre-Phase and Phase I participants – ASW attendees, the general population, and Steering Committee – consistently identified Louisville's most threatening shocks and stresses as:

- Inequity
- Poverty
- Riot/Civil Unrest
- Drug Epidemic
- Economic Crisis
- Infrastructure Failure
- Crime and Violence
- Decline of Natural and Built Environment
- Lack of Government Funding
- Low Performing School System

Participants clearly stated that Louisville needed to focus on building human resilience and in order to build resilience, we must envision Louisville's future through the lens of equity.

The results of the Pre-Phase and Phase I not only identified Louisville's shocks and stresses but also shaped four Discovery Areas that defined the Phase II working groups' direction: 01 – Enrich a Culture of Compassion and Trust; 02 – Enhance Resilience to Trauma; 03-Increase Financial Capacity, Wealth Building and Economic Opportunity; and 04 – Strengthen the Built and Natural Infrastructure that Promotes Health and Well-being. Over the course of three months, 114 people formed the Discovery Area Working Groups and met regularly to shape Louisville's strategy document defining four visions, 10 goals and 46 actions. Louisville's community members drove this process and relied upon the collaboration of action owners during the implementation phase to ensure its completion.

The Resilient Louisville Strategy Document (SD) links the community voice to the city's strategic plan for Louisville's growth and prosperity. Furthermore, each vision is linked to the United Nations Sustainable Development Goals. Threaded throughout the Louisville Resilience visions – **Embrace Lifelong Learning, Ensure a Safe + Healthy City, Build a Vibrant Economy + Place, and Maximize Innovation + Civic Engagement** – are images that represent the United Nations Sustainable Development Solutions Network (SDSN).[2]

The Connection

Resilient systems withstand, respond to, and adapt more readily to shocks and stresses bouncing back stronger after tough times and live better in good times. –100RC

At the initiation of the resilience process, the goal was not localization of the United Nations Sustainable Development Goals (SDG) nor integration of the Louisville Metro Strategic Plan. Those two events occurred as an unexpected, but welcomed, outcome of the process.

Community Vision

Louisville is committed to building resilience by creating a culture of equity, compassion, and trust (R=E+C+T). We will do that through addressing environmental and system structures, presenting new policy, and understanding the role of historical policies in preventing residents from achieving their full human potential. Built upon community feedback, Louisville will be a city where every resident has opportunities to thrive. Intentionally

to achieve resilience every vision, goal and action contained in the SD must lead to greater community, equity, compassion and trust.

Local Government

Mayor Greg Fischer leads Louisville under the values of life-long learning, compassion and health emphasizing human resilience as foundational for a community to thrive. It is the charge of our government to continue as a transformative agent for this city and to move with force. The goals of the Louisville Metro Strategic Plan clearly aligned with the community's course of action during the Resilient Louisville phases and demonstrate congruence Louisville's strategic direction.[3]

The Sustainable Development Goals

After a multi-year process reaching back to 1972, the United Nations Sustainable Development Goals (SDGs) were adopted on September 25, 2015, to succeed the Millennium Development Goals that ended the same year. The September agenda, "Transforming Our World: the 2030 Agenda for Sustainable Development," outlined the Sustainable Development Goals, associated targets and indicators setting an international call to action. The SDSN, working with a team of experts, developed and began implementing the 17 SDGs as practical solutions to address global issues, reaching across six continents.[4]

In writing our community's vision, goals and actions it became apparent that we were linking the Resilient Louisville Strategy Document, the Mayor's Strategic Plan and the SDSN into one cohesive, forward-thinking direction. The significance of this is evident. Our local efforts to build a resilient city is mirrored in a hierarchy of visions – international, local and community – setting a unified direction.

The intersection of Louisville's visions and the SDG categories' relevance occurs when considering the interdependency of the two in achieving optimal outcomes. A significant relationship of equity, compassion, and trust connect across each leading to Louisville's goal of ensuring a resilient city. The visions must be viewed through the lens of equity focusing upon sustainable development that leads to justice for people and the planet. If we are to build human resilience, we must allow all people to experience their highest human potential affording the capacity for health, well-being, and prosperity. People have the right to equitable educational opportunities, fair wages, and live in peace and harmony within safe surroundings.

A DEEPER DIVE - Goals, Actions, and Targets

Goals. The Brookings Institute identifies interrelated drivers of poverty and their impact on quality of life. These four dimensions are educational attainment, health status, quality of place and level of employment[5] aligning with the more comprehensive 11 root causes of poor health: education, employment and income, built environment, transportation, food systems, early childhood development, health and human services, neighborhood development, housing, criminal justice, and environmental quality.[6] The four dimensions, 11 root causes, and goal sets are interdependent across the spectrum of goals and their associated actions, and targets. For example, if we are to impact poverty, all residents require equitable access to education leading to living wage employment and economic mobility in order to afford fair housing and live in safe and healthy environments.

The interrelationship among the dimensions, root causes, and goals are clear. It is evident that these issues are universal and that the solutions rely on ameliorating systemic conditions that have formed historical barriers that disenfranchise population groups. If we are to strengthen human resilience, we are required to address the drivers and root causes by achieving the goals delineated in the SD and SDG. SD Goal 4.1 develops the foundation of community cohesion led by social-change agents moving within the formula of R=E+C+T. These agents are called upon to catalyze a transformative environment and build a platform for structural change. However, in view of the diverse ownerships of the

Resilient Louisville Strategy Document (SD) Visions	Louisville Metro Strategic Plan	United Nations Sustainable Development Goals Focus
Embrace Lifelong Learning	Life-Long Learning	Prosperity
Ensure a Safe + Healthy City	Equity, Resilience, and Compassion	People
Build Vibrant Economy + Place	Safe and Healthy City	Planet
Maximize Innovation + Civic Engagement	Vibrant Economy and Place	Peace
	Innovate and Operationally Excellent City	Partnership

actions, each owner entity will assume the role of a change agent as they move toward transformation.

Actions and Targets. Between the SD and SDG there are 215 actions and targets with more than 50% of the 46 SD actions aligning with SDG targets. Selected examples of alignment from each of the four SD Visions on the table below.

What does this mean?

If Louisville is to be a resilient city, we must work together to tackle generational, individual and community trauma that exacerbates chronic stress. Trauma is both environmental and experiential taking many shapes and forms and frequently driven by poverty, hunger, inequalities, violence, and social injustice – a daily reality for many Louisville residents. Research indicates that traumatic stress transfers across generations creating physiological harm to individuals.[7] Collective trauma, caused by events such as violence, impacts entire communities and may result in feelings of being threatened and post-traumatic stress disorder.[8] Louisville's neighborhoods with the highest rates of asthma, diabetes, heart disease and cancer also are the neighborhoods with the shortest life span and the greatest concentration of poverty, hunger, unemployment, poor housing and violence.

The Resilient Louisville actions impact trauma from the stance of experience and environment. By helping children who experience trauma build resilience, we reduce the negative effects of chronic stress and set a foundation for better health outcomes.[9] Our actions train decision makers, educators, healthcare providers, the faith community, social service and government workers, and parents on the impact of trauma and on developing effective interactive skills. Our actions provide access to the outdoor environment for urban children and families through programming

SD Goal	Resilient Louisville Strategy Document (SD) Goals	SDG Goal	United Nations Sustainable Development Goals (SDG)
1.1	Ensure Equitable Education Attainment for All Residents	1	No Poverty
		2	Zero Hunger
1.2	Attract Retain and Develop Talent for the Workforce of the Future	3	Good Health & Well-being for people
		4	Quality Education
2.1	Address the Needs of Louisville's Most Vulnerable Populations	5	Gender Equality
		6	Clean Water and Sanitation
2.2	Implement Trauma-informed Violence Reduction Strategies	7	Affordable and Clean Energy
		8	Decent Work and Economic Mobility
2.3	Strengthen Built and Natural Infrastructure to Promote Health and Well-being	9	Industry, Innovation and Infrastructure
		10	Reduced Inequalities
3.1	Ensure Inclusive and Equitable Economic Growth in Historically Marginalized Communities	11	Sustainable cities and Communities
		12	Responsible Consumption and Production
3.2	Increase Individual Financial Stability and Opportunity for Economic Mobility	13	Climate Action
		14	Life Below Water
3.3	Build upon Louisville's Cultural Assets	15	Life on Land
		16	Peace, Justice and Strong Institutions
4.1	Cultivate Social-Change Agents and Foster Greater Community Cohesion	17	Partnerships for the Goals
4.2	Implement Shared Transparency & Accountability Measures with the Community		

and increased natural infrastructure, green space, in urban areas supporting the research that connecting people to nature promotes health and well-being.[10]

Trauma is caused by insufficient basic needs often tied to lack of education, unemployment and inequitable practices. Louisville's strategies embrace life-long learning ensuring equitable education attainment and developing workforce talent. We will strive to increase individual financial stability and opportunity for economic mobility by implementing strategies for an equitable workforce. Actions will increase investment without displacement in neighborhoods impacted by historic discriminatory practices. Two ways that we will do this are developing and preserving affordable housing and increasing opportunities for entrepreneurship.

For our actions to effectively impact trauma, we must acknowledge the historical policies that create barriers and shape

SD Action	SDG Target
1.1.3 Ensure that students entering kindergarten are school-ready.	4.2 Ensure that all girls and boys have access to quality early childhood development care and pre-primary education so that they are ready for primary education.
1.2.1 Develop partnerships with the business community to provide youth with mentorship and real-job experience.	8.6 Reduce the proportion of youth not in employment, education or training.
2.1.5 Promote the development of a more robust and equitable food system focused on waste reduction, donation and composting.	2.1 End hunger and ensure access by all people to safe, nutritious and sufficient food all year round.
2.1.8 Respond to the substance use epidemic through prevention, harm reduction, treatment and recovery.	3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.
2.2.4 Promote civic engagement and collaboration, leading to community action plans that address violence.	16.1 Significantly reduce all forms of violence and related death rates everywhere.
2.3.2 Improve and maintain a stable, multimodal transportation system that effectively integrates all modes of mobility to ensure availability, accessibility and affordability.	11.2 Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport.
2.3.3 Increase renewable energy at multiple scales.	7.2 Increase the share of renewable energy in the global energy mix.
2.3.7 Implement strategies to mitigate climate change impacts.	13.2 Integrate climate change measures into national policies, strategies and planning.
3.1.2 Identify and remove barriers to racial equity in procurement and contracting practices.	12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.
3.3.1 Improve equitable access to the outdoors for Louisville youth and families.	11.7 Provide universal access to safe, inclusive and accessible, green and public spaces in particular for women and children, older persons and persons with disabilities.
3.3.4 Maintain a "Welcoming City, align community resources to integrate and empower our foreign-born community and continue to grow our foreign-born population.	10.2 Empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.
4.2.2 Foster community trust by publishing and visualizing open data.	16.6 Develop effective, accountable and transparent institutions at all levels.

A Louisville ECHO (Engaging Children in the Outdoors) youth discovered nature during an experiential field trip to Red River Gorge.
Photo credit: Louisville Metro Parks Natural Areas

implicit biases. Our actions call upon compassionate social change-agents that foster greater community cohesion and roll up their sleeves to volunteer and serve. As a city, we will reduce trauma by ensuring inclusivity and seeking equity for all residents.

By achieving our strategy document actions, Louisville realizes many of the United Nations Sustainable Development Goals.

Conclusion

"***As we embark on this great collective journey, we pledge that no one will be left behind. Recognizing that the dignity of the human person is fundamental, we wish to see the goals and targets met for all nations and peoples and for all segments of society. And we will endeavor to reach the furthest behind first***." (2030 Agenda for Sustainable Development)

For the United Nations to attain the SDGs, it will take effort from every country at every level. The SDG outcome relies upon local change. In Louisville Metro, we believe that the Resilient Louisville Strategy Document – driven by the community and reinforced by the Louisville Metro Strategic Plan - outlines a path forward for Louisville in the international charge. The Resilient Louisville Strategy Document earmarks direction and by weaving the four visions we form a platform for integration of the actions recognizing the interdependency. As noted in the 2017 Health Equity Report, to build equity, multiple indicators of inequity need to be addressed. The work is important. The national Robert Wood Johnson Foundation 2019 County Health Rankings and Roadmap program states that Jefferson County ranks 83 in Kentucky's 120 counties for poorest social and economic factors that impact health: high school graduation rate, unemployment, children in poverty and income inequality.[11] These factors significantly impact health outcomes and are established actions listed in the Resilient Louisville Strategy Document.

We recognize that this multi-year initiative faces barriers that need to be addressed. Our community stakeholders acknowledged one barrier when they identified one of Louisville's stresses as lack of government funding. While many of the actions fall under Louisville Metro Government, others exemplify what we can accomplish through community-driven initiatives. We also recognize the potential of community-government synergy through shared paths and communication.

This process made it clear that all – the community, local government, and the United Nations –realize the needs. The Resilient Louisville Strategy Document defines the action to mitigate those needs and designed the formula R=E+C+T as the blueprint. Louisville is as strong as the least resilient. We are moving forward under the vision that all in Louisville will reach their full human potential.

References

1 www.100resilientciteis.org.

2 https://louisvilleky.gov/sites/default/files/community_services/pdfs/20190607_resilient_louisville_softrelease_lowres_spreads.pdf.

3 https://louisvilleky.gov/government/mayor-greg-fischer/strategic-plan.

4 United Nations General Assembly Seventieth Session, Agenda items 15 and 116.

5 Louisville A Focus on Poverty, The Greater Louisville Project. Greaterlouisvilleproject.org/reports/2015-competitive-city-update/.

6 Louisville Metro Health Equity Report 2017. https://louisvilleky.gov/government/center-health-equity/louisville-metro-health-equity-report-2017.

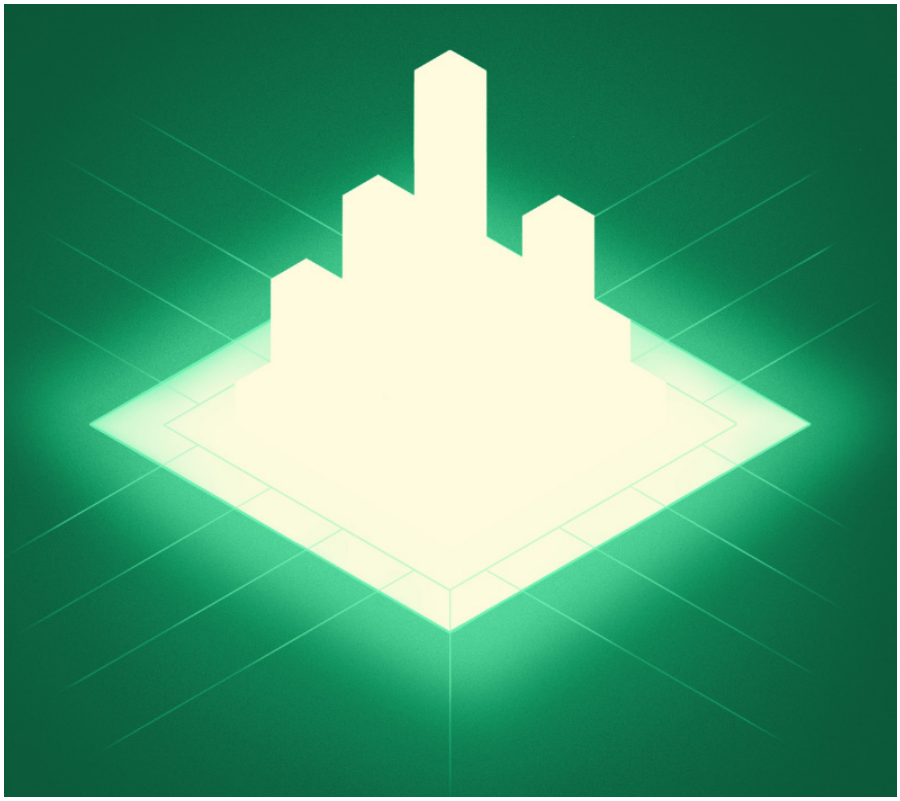
7 Franklin T.B., Russig H, Weiss I.C., Graff J, Linder N, Michalon A., Vizi S, and Mansuy I.M. Epigenetic transmission of the impact of early stress across generations. BIOL PSYCHIATRY 2010; 68-408-415.

8 Vitelli R. When the trauma doesn't end: how can people learn to live with chronic traumatic stress? https://www.psychologytoday.com/us/blog/media-spotlight/201305/when-the-stress-doesnt-end.

9 www.bouncelouisville.org.

10 University of Exeter, Hogan M. Two hours a week is key dose of nature for health and wellbeing. Science News. https://www.sciencedaily.com/releases/2019/06/190613095227.htm.

A Pathway to Sustainable American Cities: A Guide to Implementing the SDGs



Nilda Mesa
Melika Edquist
Jessica Espey

Introduction

Cities are where the rubber meets the road. Dreams are made and broken in cities. They are the economic engine for states, regions, and countries. They are centers of innovation and culture. They are also where some of our most profound and intractable problems are most challenging and most apparent. Cities are also where policy can have most direct impact, and where government is required to be most responsive and pragmatic.

If, as Tip O'Neill used to say, "all politics is local," it is also true that all cities are judged by their quality of life and opportunities, regardless of who happens to be in office. Cities large and small across the U.S. share goals such as providing safety and security, good schools, good jobs, decent housing, access to health care, clean water and air, and reliable and direct transport systems. They aim to provide a steady future and the promise of a ladder up for recent arrivals, as well as long-term residents. No matter a city's size, climate, economic health, or geography, these goals are remarkably consistent.

This guide takes the best features of the internationally-accepted Sustainable Development Goals (SDGs) and grounds them in the American system of urban government. It provides a framework that cities can customize to work toward setting their own specific goals within their unique circumstances–identifying gaps, setting up benchmarks and timelines, and taking advantage of strategies and processes that have already been developed through a common, vetted framework. It is intended to strengthen ongoing policymaking rather than add another layer of requirements and expense.

The Sustainable Development Goals: A Global Vision for Livable Communities, Thriving Economies, and a Healthy Planet

In 2015, the United States was one of 193 countries within the United Nations to adopt the SDGs and the principles that guide them, including an imperative to leave no one behind. Sometimes referred to as the Global Goals, they are a collection of broad goals related to economic, social, and environmental concerns. Each goal has independent targets, indicators, and timelines with which to assess their progress, but they are also situated within an overarching framework that recognizes their strong interdependence upon one another. For example, achieving quality education and gender equality (SDGs 4 and 5) also support the goals of ending poverty and hunger (SDGs 1 and 2), as well as decent work and economic growth (SDG 8).

While not all the goals and targets apply in equal measure to all countries and regions, they serve as a common framework to address the essential elements of long-term sustainable development.

The SDGs are big and ambitious. Their intention was to set goals that, while difficult to achieve, are not entirely out of range. They are meant to inspire policymakers and encourage collaboration. They also set targets toward achieving those goals. Last but not least, by tracking progress through specific indicators, policymakers can see how they are moving toward their aims and adjust as necessary to account for new information or changing conditions.

The SDGs have the advantage of tracking very closely with the priorities of the U.S. Conference of Mayors and its member cities,

as demonstrated by the resolutions adopted in their 86th Annual Meeting in 2018 (Annex 1). Mayors from across the political spectrum and from all corners of the country have, by consensus, adopted coherent policies around critical topics in sustainable development.

A 2018 study conducted by Bloomberg Philanthropies identified the most common concerns expressed across cities by mayors and city managers. Topics that arose again and again included infrastructure, traffic, climate, inequality, affordable housing, education, drug abuse, crime, budget, and jobs. Shifts in funding are also a primary concern for many mayors, as is a changing relationship with the federal government. These types of issues are all addressed with clear goals and targets in the SDGs.

Within the SDGs, cities are seen as so important to achieving sustainable development that they have their own goal—Goal 11 (see Page 7). The rest of the goals go into depth on issues that have a direct and specific impact on city residents, such as clean water and education, and achieving them will contribute to the economy, livability, and public health in cities. Indeed, the SDGs were written so that the entire framework would be relevant at different scales and could be localized, ensuring that no one is left behind and that different jurisdictions of government and stakeholders across society can move in the same direction, toward the same common goals.

SDG 11 Sustainable cities and communities: Make cities and human settlements inclusive, safe, resilient, and sustainable

Goal 11 has ten targets. For the most part, they track U.S. cities' common goals, many of which appear in the U.S. Conference of Mayors' priorities.

11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

11.2 By 2030, provide access to safe, affordable, accessible, and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities, and older persons.

11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated, and sustainable human settlement planning and management in countries.

11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.

11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.

11.6 By 2030, reduce the adverse per capita environmental impact of cities, including paying special attention to air quality and municipal and other waste management.

11.7 By 2030, provide universal access to safe, inclusive, and accessible green and public spaces, in particular for women and children, older persons, and persons with disabilities.

11.A Support positive economic, social and environmental links between urban, peri-urban, and rural areas by strengthening national and regional development planning.

11.B By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation, and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.

11.C Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials.

A Pathway to Sustainable American Cities: A Guide to Implementing the SDGs18. Starting to work with the SDGs in your city in ten steps

To avoid "reinventing the wheel," a city can start with the SDGs as a guide, saving valuable time and resources toward setting goals and developing strategies. While the SDGs will not all apply in the same way for all cities, they can be prioritized and customized to meet the conditions and requirements for any city. As the examples above demonstrate, the SDGs are a useful complement to ongoing city policymaking, sustainability planning, or urban and economic planning. They can also strengthen efforts already underway and identify opportunities for the future.

While the SDGs can and should be integrated into a city's existing processes, there are several key stages to ensuring a city will make the most of the SDGs as an analytical and planning tool. Following these steps will help to set up the solid system and mechanisms needed to achieve the best results.

The 10 steps to support sustainable development planning in U.S. cities are:

1. Setting up the leadership and management structure, including budget and timelines, for the planning process
2. Identifying core values for your city
3. Establishing work teams
4. Assembling baseline data, including population trends and economic conditions
5. Taking stock of what your city is already doing that aligns with the SDGs, identifying gaps, and analyzing those most important to fill
6. Identifying budget resources and potential funding sources
7. Developing a draft framework for the plan, including targets, benchmarks, metrics and indicators
8. Identifying stakeholders, outside advisors (including university and academic partners), and community resources; establishing processes to work with them; and integrating their knowledge and ideas into the drafted plan
9. Aligning budgets and accountability mechanisms, including metrics and indicators, and final reviews
10. Launching the plan while establishing the feedback and accountability mechanisms

Step 1: Setting up the leadership and management structure, including budget and timelines, for the planning process

- Leadership: Visible buy-in from city leadership, such as the mayor, will ensure that SDG integration with the city's processes is a priority. Related activities could include the mayor presiding at the kickoff meeting for the internal process, regular reviews, budget support for the team, and clear involvement of senior staff at City Hall throughout the process, including the communications and legislative offices.

- Management Structure: A lead director or coordinator who has the authority and expertise to manage the process should be designated at the start. Offices and agencies that have played this role in cities include sustainability, resiliency, planning, and City Hall advisors.

- Budget and Timelines: Senior leadership should establish a detailed timeline and budget for this process. Having a firm deadline that the mayor sets will focus the planning process and encourage efficiency. The end goal should be a comprehensive, ready-to-launch plan.

Step 2: Identifying core values for your city

- Develop a vision that incorporates the values of your city and its people and prioritizes the issues and areas that require urgent attention. At their best, goals and initiatives embody a cohesive set of values and visions of what a city could be, of a city at its best, at its highest potential.

Step 3: Establishing work teams

- Since the SDGs are interdisciplinary and cross-cutting, it is critical for the team to represent the relevant agencies and have a variety of backgrounds and expertise. They should also be competent researchers or have researchers under their direction, and be familiar with working with data for policy planning and tracking. They should also be familiar with city programs and have agency-level expertise on citywide challenges and current initiatives.

Step 4: Assembling baseline data, including population trends and economic conditions

- Establishing a baseline of data as you launch your efforts will allow you to assess progress toward your goals and ensure resources are spent wisely. Notably, you should assemble key population, economic, environmental, social, and health data as current snapshots and as trends over the last 5 to 10 years. Where possible, trends should be broken down–disaggregated–by community or neighborhood, as well as other categories such as gender and age.

Step 5: Taking stock of what your city is already doing that aligns with the SDGs, identifying gaps, and analyzing those most important to fill

- Your city may already be part of other networks and initiatives. You may already have a planning process. You may already have a sustainability or climate plan. There is no need to duplicate efforts; it is best to build upon what you are already doing so that you leverage your resources, time, and efforts wisely. Use the SDGs as an analytical tool to identify gaps and test assumptions about what is possible and thus whether your city is going in the right direction. Then leverage the SDGs to take advantage of expertise, experience, and resources from other cities, foundations, universities, and the private sector.

Step 6: Identifying budget resources and potential funding sources

- Every city will have its own budget and planning processes, which likely include long-range capital planning as well as year-to-year budgeting. These may also involve outside institutions such as a comptroller's office, bonding authorities, and a legislative body such as a city council or assembly. As a starting point, the

budget office can work together with agencies to identify what is already funded and what are the sources and legal limitations of that funding.

Step 7: Developing a draft framework for the plan, including targets, benchmarks, metrics and indicators

- Establishing interagency working groups focused on a particular SDG and its indicators, with deadlines and deliverables, are a great way to move the process along at the draft phase. It will be important to ensure all agencies relevant to that SDG are represented and actively participating in each working group. It will also be important to limit the scope of the working groups while holding them accountable to related deadlines, as some groups may attempt to expand their purview. Ideally, there should be several rounds of drafts submitted to senior leadership and the project director, as well as the internal advisory board. This is also a good time to source feedback from other stakeholders such as city council members.

Step 8: Identifying stakeholders, outside advisors (including university and academic partners), and community resources; establishing processes to work with them; and integrating their knowledge and ideas into the drafted plan

- A Pathway to Sustainable American Cities: A Guide to Implementing the SDGs30. Any plan will depend on the acceptance and participation of the city's residents, sectors, and institutions. Moreover, they will have specialized information and different perspectives and insights that will improve the quality of the final plan. While relying on the expertise and analytical power of local universities is beneficial to the successful framing of an SDG plan, local stakeholders will be the best experts on their communities and the dynamics that make a city work for them or miss the mark. They can also be champions and allies, and can play a role in assessing progress, identifying roadblocks and detours, and finding resources. It is never too early to begin the process with them.

Step 9: Aligning budgets and accountability mechanisms, including metrics and indicators, and final reviews

- Bench-marks, metrics, and indicators are vital components of an effective, long-term resiliency and sustainability plan and the entire SDG framework. They point to what is working or not and allow for modification and improvement, thereby improving program performance and cutting waste and expense. As part of a reporting system, they contribute to greater transparency for city residents and stakeholders. They can also promote confidence and trust in the goals as well as a city's efforts toward them.

Step 10: Launching the plan while establishing the feedback and accountability mechanisms

- The communications and community relations teams, who should have already contributed to the process, should now play a particularly large role. If the plan is to be a living and breathing document, these teams can strategize how best to follow through with related dialogue and engagement, such as through social media or public meetings.

Conclusion

The 17 SDGs track closely with the high-level aspirations that U.S. mayors have already identified, ranging from reducing (even eliminating) poverty, to ensuring affordable housing, to promoting clean energy and climate, to providing clean water, to safeguarding good health, to fostering innovation and infrastructure. Rather than reinvent the wheel, using the SDGs as a tool to complement city efforts can both inspire and ground a city's comprehensive, long-term planning process.

The SDGs are versatile. As U.S. cities start using them, they see that the SDGs can be used to solidify a vision and mark a city as a leader. Cities can use the SDGs as a tool to analyze how a city's existing pro-grams match up with the aspirations of its leadership. They can reveal gaps, duplication, and opportunities for coordination, as well as budget savings among agencies. They can catalyze discussions with residents and promote engagement. They can be the gateway for cities to bring in experts and additional resources through partnerships with local universities, foundations, and others. They can reveal how systems are interconnected and how to make them work together. Through management tools that track performance and measure results, cities can stay on course toward their goals.

Weaving the SDGs into a city's strategic planning can jumpstart a city's own goals. They can challenge a city to aim higher, as well as marshal the management resources and people to meet those goals. A smart city–one that responds to changing conditions while holding true to the values of its residents, with sound planning and commitment for the years ahead–will bring the livability, peace and stability that is necessary for a city to thrive. It holds the potential to bolster the institution of democracy and provide for sound governance and accountability.

Ultimately, a plan based on the SDGs and geared to a city's priorities, strengths, weaknesses, and culture, with the inclusion and participation of its residents and stakeholders, marks the way forward for a city to live up to the best it can be.

References

Chicago, City of. 2019. Accessed 2018. https://www.chicago.gov/city/en/depts/dcd/provdrs/sustain.html.

City of Boston. 2018. Climate Action Plan. Accessed 2019. https://www.boston.gov/departments/environment/climate-action-plan.

City of Los Angeles. 2019. Mayor's Dashboard: Back to Basics. http://dashboard.lamayor.org/.

City of Los Angeles. 2018. pLAn . Accessed 2019. http://plan.lamayor.org/.

City of Los Angeles. 2018. Resilient Los Angeles. March. https://www.lamayor.org/sites/g/files/wph446/f/page/file/Resilient%20Los%20Angeles.pdf.

City of New York. 2018. OneNYC. Mayor's Office of Sustainability. Accessed 2019. https://onenyc.cityofnewyork.us/.

City of Orlando. 2018. 2018 Community Action Plan Updates. Accessed 2019. https://beta.orlando.gov/NewsEventsInitiatives/Initiatives/2018-Community-Action-Plan#section-2.

City of San Jose. 2018. "San José Becomes One of First American Cities to Approve Paris Compliant Climate Plan." Accessed 2019. https://www.sanjoseca.gov/DocumentCenter/View/75360.

College, Occidental. 2018. "https://www.oxy.edu/news/occidental-los-angeles-partner-sustainable-development." Occidental College News. February 5. Accessed 2019. https://www.oxy.edu/news/occidental-los-angeles-partner-sustainable-development.

Davis, Amanda. 2018. Calculating the Percent of Households Earning a Living Wage to Monitor Progress for Achieving SDG 8. Accessed 2019. http://unsdsn.org/wp-content/uploads/2017/12/180123_trends-briefbaltimore-living-wage.pdf.

Espey, Jessica, Hayden Dahmm, Laurie Mandarino. 2018. Leaving No U.S. City Behind: The U.S. Cities Sustainable Development Goal Index. UN-SDSN, New York: UN-SDSN. http://unsdsn.org/wp-content/uploads/2018/06/US-Cities-Index-Report.pdf.

Greene, Soloman, Brady Meixell. 2017. Hacking the Sustainable Development Goals: Can US Cities Measure Up? Urban Institute, Urban Institute.

Hawaii Green Growth. 2019. Aloha+ Challenge. http://aloha-challenge. hawaiigreengrowth.org/.

Iyer, Seema. 2018. "Finding Sustainable Data Sources to Track Evictions to Monitor Progress for Achieving SDG #16." UN-SDSN. Accessed 2019. http://unsdsn.org/wp-content/uploads/2017/09/180123-trends-briefbaltimore-evictions.pdf.

Iyer, Seema. 2018. "Localizing the UN Sustainable Development Goals in Baltimore: Next Steps towards Implementation." UN-SDSN. Accessed 2019. http://unsdsn.org/news/2017/12/20/localizing-sdgs-in-baltimore-next-steps/.

Jones, Phil. 2018. What is the difference between a measure and an indicator. January 2. Accessed 2019. https://www.excitant.co.uk/whatis-the-difference-between-a-measure-and-an-indicator/.

Live Green Connecticut. 2019. Live Green Connecticut. http://www.livegreenct.org/.

Mendelson, Sarah and Pipa, Tony. 2018. US cities leading on the Sustainable Development Goals. Accessed 2019. https:/www.brookings.edu/blog/up-front/2018/12/19/us-cities-leading-on-the-sustainable-development-goals/.

NYC Mayors Office. 2016. "Global Vision, Urban Action: A City with Global Goals." Accessed 2019. https://view.publitas.com/nyc-mayorsoffice/a-city-with-global-goals-parts-i-and-ii-for-download/page/1.

NYC Mayor's Office. 2018. NYC is First City in the World to Report to UN on Local Steps Toward Global Goals. Accessed 2019. https://www1.nyc.gov/site/international/programs/voluntary-local-review.page.

NYC Mayor's Office of International Affairs. 2016. Global Vision Urban Action. Accessed 2018. https://view.publitas.com/nyc-mayors-office/acity-with-global-goals-parts-i-and-ii-for-download/page/1.

SDSN USA. 2018. SDSN United States of America. Accessed 2019. https://networks.unsdsn.org/usa/.

Stanford Sustainable Urban Systems. 2017. "SDG Data Tools Supporting Action in the California Bay Area." September 20. Accessed 2019. http://unsdsn.org/news/2017/09/20/sdg-data-tools-supporting-actionin-the-california-bay-area/.

UN-SDSN. 2017. USA Sustainable Cities Initiative. Accessed 2019. http://unsdsn.org/what-we-do/solution-initiatives/usa-sustainable-cities-initiative-usa-sci/.

US Conference of Mayors. 2018. 2018 Adopted Resolutions. Accessed 2019. http://legacy.usmayors.org/resolutions/86th_Conference/proposedcommittee-preview.asp?committee=Children,%20Health,%20and%20Human%20Services.

The USA Sustainable Cities Initiative: Lessons for City-Level SDG Action (Sustainable Cities)

Sandra Ruckstuhl
Jessica Espey
Leslie Rae
Sustainable Development Solutions Network

In September 2015, the Sustainable Development Solutions Network (SDSN) partnered with leading academic institutions through the USA Sustainable Cities Initiative (USA-SCI) to pilot technical processes for long-term strategies on the Sustainable Development Goals (SDGs) in three U.S. cities: New York, San José, and Baltimore.

The foundation of the pilot cities' SDG strategy process was "start with what we know." The cities found it most efficient to launch their efforts by building up their SDG achievement strategy from existing city plans and programs. They used the SDGs, targets, and indicator frameworks as tools to improve their city-level sustainability efforts by making them more comprehensive and coordinated. The cities determined the most efficient path was to systematically examine and coordinate their plans and data resources, as well as capitalize on existing political initiatives and will, institutional mandates, financing mechanisms, and human talent. Due to their own resource limitations, efficiency and coordination have been a consideration in every step of their process. This paper aims to provide guidance and structure for other cities with these same concerns.

The pilot cities found that SDG indicators and data provided a common language for strategy building, helping to structure coherent discussions about a coordinated city initiative in order to meet the goals by 2030 and beyond. As alignments between SDG targets and city data systems were determined, policymakers and other stakeholders established common understanding of their long-term vision, the impact they wanted to achieve, and their starting points.

Lessons Learned: Strategy Development and Target Mapping

The three pilot cities established that the best starting point for a local SDG initiative was to review existing city plans and strategies and assess how those aligned to the SDGs and associated targets. All of the cities had existing plans and policies closely related to SDG themes, representing local priorities, experience, and acute knowledge. Therefore, pilot cities felt strongly that SDG initiatives should "grow from what we know," rather than launching an altogether new strategy process that may be viewed as externally-driven, duplicative, and inefficient. Developing an organized record of the interlinkages between existing plans and policies and the SDG goals and targets helped to build stakeholder knowledge and confidence and informed the development of an SDG strategy. Each city chose to conduct a systematic assessment of this kind, using a spreadsheet-based "mapping worksheet" as a guide.

In all three cities, mapping provided a framework to assess the comprehensiveness of existing sustainability plans against the SDGs, their targets, and their indicators. Existing plans and strategies–such as master plans, sector strategies, and sustainability plans–may not cover all 17 SDGs and 169 targets, but they can help ground SDG action in work and projects that are already established. Mapping is a way to guide action so cities can build more complete plans, inclusive of local targets and monitoring systems. Mapping exercises also promote transparency, accountability, and participation while building SDG achievement strategies. Furthermore, the mapping tool allowed stakeholders to connect SDG concepts to existing language and knowledge that frame their local efforts.

The cities took the primary step of mapping existing local SDG-related targets and gaps in order to ensure that the SDG effort was built up from current plans and resources. This mapping exercise was done by reviewing local plans and strategy documents. It documented how city-based targets matched up with the SDGs and their targets. The individual steps in the target mapping process are outlined below:

1. **Create a library of existing city strategies and plans that correlate with the SDGs**. The cities surveyed official documents that they thought could provide a good overview of existing SDG-related policies, investments, human resources, and data. The documents included: city master plans, sustainability plans, and sector strategies.

2. **Review the requirements of the SDG Mapping Worksheet and determine which city documents would be most useful for completing the worksheet**. In New York, the target mapping effort focused on the OneNYC plan, which was approved in April 2015. This document was chosen because it was determined to be sufficiently comprehensive in detailing the majority of the city's relevant strategies. Similarly, San José reviewed its Envision 2040 Master Plan. The University of Baltimore determined it more relevant and comprehensive to review a series of sector strategies, some of which were under implementation and others of which had recently expired but had not been replaced.

3. **Locate SDG-aligned targets in the chosen city documents**. The USA-SCI academic partners reviewed the documents to locate SDG-aligned targets, and they noted these on the Mapping Worksheet (Column D). They also noted the institutions named as being responsible for achieving each of those targets (Column F). When no target was identified, the partners found it beneficial to insert the names of local institutions that could be made responsible for that target into the correlating cell in Column F. This helped to inform next steps in consultations as the city built an SDG achievement strategy.

4. **Where local SDG-aligned targets are blank (Column D), determine which corresponding global SDG targets (Column B) are relevant for the city and which are not**. The determination of relevant versus irrelevant targets helped to focus attention and resources during the SDG strategy-building process. Not all 169 SDG targets are relevant to a city. It has been estimated that 65 percent of the SDG agenda is dependent upon urban and local actors, while the rest is the purview of national governments and the international community.

5. **Populate blank cells (in Column D) where the SDG target is marked "relevant."** The cities identified several methods for filling blank cells in Column D that were marked as relevant. In Baltimore, the university team contacted city staff with expertise on topics related to the target (e.g. the institutions named in Column F) and reviewed additional city documents that were potentially relevant to the target. The pilot cities recommend two methods cities can use to fill in these blank cells:

    - First, expand the scope of the literature and policy document review to include SDG-aligned programs and documentation of non-government entities (e.g. charitable organizations, corporations, and nongovernmental organizations).

    - Second, use a reverse process for setting targets. The reverse process would involve following Step 2 (Measurement) to establish a local measurement indicator for the SDG target, and then using this indicator and the baseline data to set a quantified target that local stakeholder scan plan toward.

6. **Take steps to quantify SDG-aligned city targets that are not yet quantified**. When conducting the document review, the city partners often found goal statements that aligned with the SDGs, but did not include a quantified target. The cities identified two functional methods for setting targets in these cases:

    - First, a city could set quantified targets in new policy documents, such as Baltimore's Sustainability Plan and San José's Environmental Sustainability Plan.

    - Second, quantified targets could be determined through local budget planning initiatives, which link to defined work plans and outcome targets for SDG-related investments in public services and infrastructure. The reverse process for target setting, as explained above, could also be used here.

Lessons Learned: Partnership and Roles

At the outset of an SDG localization effort, it can be helpful to clarify different actors' roles and responsibilities. An inclusive localization process should involve government stakeholders, civil society, and academia to different extents.

Government focal points–Offices of Sustainability

Identifying which government department will lead on SDG coordination and implementation within a city can be challenging. This often depends on departments' resources and capacities, future plans, and departmental commitment. But the SDGs also present an opportunity for departments to build capacities and attract funding.

In the three pilot cities, the Office of Sustainability (or its equivalent) was considered a natural home for the effort. In Baltimore, the Office of Sustainability was actively involved in the USA-SCI consultation process from 2015 to 2016. Though the Office of Sustainability did not initially lead the SDG effort, they have since assumed an integral role in carrying the agenda forward and have recently launched a new sustainability plan that links to the SDGs. San José has also recently launched a new sustainability plan, entitled Climate Smart San José. It is a collaborative effort between the Mayor's Office and the Environmental Services Department, which houses the Manager for Sustainability and Compliance.

Though it may not be the initiator for the city's SDG efforts, a city's Office of Sustainability can be the general gatekeeper and coordinator for sustainability initiatives, making it an integral government partner for an efficient effort in the long term. But if such an office exists and its mandate does not cover the spectrum of the SDGs, then Agenda 2030 provides a platform to consider expanding that mandate. In San José, for example, the city considered various options for establishing a hub to coordinate sustainability policy and programs, such as by expanding the resources of the Sustainability and Compliance Manager's office or by creating a sustainability team within the Office of Civic Innovation.

Government Leadership

High-level government endorsement for a local SDG initiative can provide significant impetus for initiating local SDG effort. In San José and New York, the mayors were vocal about their interest in and commitment to the SDGs before the USA-SCI pilot project commenced; for example, both signed on to a Declaration of Support for the SDGs in New York in 2015. However, as USA-SCI was launched during an election period in Baltimore, obtaining an official endorsement from the city government was not possible. In lieu of this support, the University of Baltimore announced its support via a press release inclusive of an endorsement by University president Kurt Schmoke; this was significant as both the institution and Schmoke (as a former mayor) have a strong history with the city. Following the mayoral election, the University of Baltimore shared information on the SDG initiative with the new mayor, Catherine E. Pugh, and she consequently released her own letter of endorsement. The challenges in securing a large, government-level announcement or endorsement of the SDGs can be complex. For this reason, having a non-government partner to support communication, particularly in early stages, is significant.

Non-Governmental Partners

Cities do not always have the capacity to launch SDG efforts, no matter how good their intentions might be. Experiences in the pilot cities show that a local knowledge partner outside of city government, such as a university or research organization, can provide much-needed technical capacity to launch and maintain an SDG initiative. In USA-SCI, university commitments and activities have served as a strong foundation for local SDG efforts. In each city, the SDG process was hosted by an academic institution that had a history of collaborating with city authorities and residents on urban policy and development issues. It was important that each of the local universities had a strong working relationship and history of partnership with city government. Under USA-SCI, SDSN partnered with the University of Baltimore and University of Maryland-College Park in Baltimore, San José State University (SJSU) and Stanford University in the San José area, and Columbia University in New York City. USA-SCI participants in the cities also suggest that independent research organizations could play a similar role.

Implementing partners in the pilot cities noted several positive factors for centering SDG activities within an academic or research institution:

- **Laying the groundwork:** Political will within the government is required in order for a coalition to effectively build an SDG localization initiative. Academic and research institutions can lay the groundwork for political engagement and support by conducting relevant analyses, informing government stakeholders, and communicating the results of mapping exercises. Once this groundwork is done, it can be easier to engage and excite political officials on the relevance and utility of the work and foster a broad sense of city and community ownership.

- **Student support:** Academic institutions can use SDG localization efforts as an opportunity to tap into student talent to conduct analysis and consultations. In turn, students benefit from a practical education on sustainability and research, which can ultimately lead to career opportunities. Baltimore maximized the involvement of university students when the University of Baltimore and University of Maryland-College Park conducted a broad review of numerous city sector strategies, data, and reporting mechanisms.

- **Public messaging:** City governments have complex public communications and messaging procedures that revolve around an overarching political agenda. For this reason, broadcasting support for the SDGs was a low priority among local government in the pilot cities. With fewer political constraints, universities and research institutions are more readily equipped to serve as communicators and educators on the SDG initiative, particularly in the initial stages. These organizations can use their own official communications channels and staff, and individual faculty members' distribution channels. Senior university administrators can also initiate high-profile communications and can serve as ambassadors to the city government, as was the case in Baltimore.

- **Program continuity:** City governments are subject to election cycles and associated policy and personnel changes, whereas academic and research institutions can provide continuity and maintain momentum over the course of these transitions. A mayoral election was underway in Baltimore during the early stages of the SDG initiative. Therefore, the University of Baltimore, a USA-SCI partner, played a convening role. It drew from the faculty's extensive experience providing data and analytical services to the city. After educating the newly elected mayor, Catherine E. Pugh, on the SDG effort, the initiative received her official endorsement. In San José, a new mayor and city councilmember promoted the

SDG effort in the city, while SJSU served as the "brain trust" and facilitator of the SDG mapping effort. SJSU's faculty, including former and current city workers, brought intellectual resources to support this analytical process. Furthermore, in both San José and Baltimore, it proved beneficial that university partners were previously involved in city development strategies and data monitoring activities, as they understood the political and technical context in which decisions had been made and how they could be made over the course of future SDG implementation.

Lessons Learned: Data and Measurement

The pilot cities determined that assessing city-level SDG data and monitoring options helped facilitate prudent planning discussions and lay the groundwork for an accountable and transparent implementation effort. Baltimore and New York used the official indicators from the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDG) as a launching point for this assessment. However, these indicators are not always directly relevant and appropriate for a city context, and the city's jurisdiction may dictate its means of participation in achievement efforts. For example, target levels (e.g. national versus sub-national), geographic context (e.g. coastal versus landlocked),and various data constraints have implications for how cities use the official indicators and structure city-level SDG monitoring. Therefore, SDG localization requires partners to critically analyze and practically identify a functional set of indicators for their city that can guide monitoring and evaluation.

The pilot cities used discussions on SDG indicators and metrics as a means to establish common language for targets and achievement strategies. This common language also helped stakeholders coordinate initiatives with complementary goals. As they determined alignment between SDG targets and city data systems, stakeholders developed a common understanding of linkages between baseline conditions and impact objectives. As such, mapping SDG-aligned data provided structure for discussions on meaningful and effective measures of success and on setting shared targets where these were missing. The cities determined measurement indicators and located indicator data with the objective of establishing an SDG data monitoring mechanism. Academic partners in San José and Baltimore are continuing to research and set up SDG data systems for the cities, and they are seeking to establish open-access SDG data platforms that align with existing datasets and provide user-friendly visualization tools for policymakers and public citizens. Additionally, all three cities are considering methods for integrating these with the U.S.'s national reporting platform for the SDGs.

The process of building SDG strategies in Baltimore, San José, and New York City yielded a variety of lessons and recommendations for other cities to consider. These USA-SCI pilot cities are continuing their SDG efforts. For example, the recently-released Climate Smart San José. The city's request for proposals, which solicited consulting services to support the creation of the plan, specified alignment with three SDGs: sustainable water (SDG 6), sustainable energy (SDG 7), and greenhouse gas emissions reductions (SDG 13). In Baltimore, the Office of Sustainability's Sustainability Plan also aligns both the SDGs and the STAR Community Rating System. This plan is an example of an integrative dual-system sustainability plan and provides a model for other cities' plans that seek to merge multiple sets of assessment criteria. At the same time, SDG partners at Baltimore Neighborhood Indicators Alliance (BNIA) are continuing to develop an SDG data platform to track the city's achievement efforts.

Other cities around the world continue to join the SDG localization effort. To support local action for SDG achievement, practical material for sub-national SDG data monitoring can be accessed on SDSN's Local Data Action Solutions Initiative webpage at https://www.sdsntrends.org/local-data-action.

References

Accastello, Eduardo, María de los Ángeles Duarte, and Mahamudo Amurane. 2015. "A Declaration of Cities' Commitment to the 2030 Sustainable Development Agenda." http://unsdsn.org/wp-content/uploads/2015/09/Declaration-Signed-as-of-26th-September-2015.pdf.

Baltimore City Health Department. 2015. "Healthy Baltimore 2015." https://health.baltimorecity.gov/healthy-baltimore-2015.

Baltimore Office of Sustainability. 2018. "Sustainability Plan." Baltimore. https://www.baltimoresustainability.org/plans/sustainability-plan.

Baltimore Office of Sustainability. n.d. "Climate Action Plan." https://www.baltimoresustainability.org/plans/climate-action-plan/.

Cities Alliance. 2015. "Sustainable Development Goals and Habitat III: Opportunities for a Successful New Urban Agenda." http://www.citiesalliance.org/sites/citiesalliance.org/files/Opportunities for the New Urban Agenda.pdf.

City of New York. n.d. "OneNYC." https://onenyc.cityofnewyork.us.

CIVICUS. n.d. "Making Use of Citizen-Generated Data."

Espey, Jessica, Hayden Dahmm, Laurie Manderino, John Biberman, Yingxin Ye, Gary Verburg, and Juan Puyana. 2018. "Leaving No U.S. City Behind: The U.S. Cities Sustainable Development Goals Index 2018." http://unsdsn.org/resources/publications/leaving-no-u-s-city-behind-the-2018-u-s-cities-sdgs-index.

Espey, Jessica, Nilda Mesa, Sandra M. Ruckstuhl, and Mihir Prakash. 2018. "A City Strategy with Global Relevance: OneNYC & the SDGs." In Smarter New York City: How City Agencies Innovate, edited by André Corrêa D'Almeida. New York City: Columbia University Press.

Iyer, Seema D. 2018. "Finding SustainableData Sources to Track Evictions to Monitor Progress for Achieving SDG #16." https://www.sdsntrends.org/research/2017/9/20/finding-sustainable-data-sources-to-track-evictions-to-monitor-progress-for-achieving-sdg-16.

LinkNYC. n.d. "LinkNYC." https://www.link.nyc.

NYC Mayor's Office for International Affairs. n.d. "Global Vision | Urban Action."

NYC Mayor's Office of Operations. n.d. "Mayor's Management Report (MMR)." https://www1.nyc.gov/site/operations/performance/mmr.page.

Prakash, Mihir, Katerina Teksoz,Jessica Espey, Jeffrey Sachs, Michael Shank, and Guido Schmidt-Traub. 2017. "Achieving a Sustainable Urban America: The U.S. Cities Sustainable Development Goals Index 2017." http://unsdsn.org/resources/publications/us-cities-sdg-index.

Romanow, Kerrie, Ashwini Kantak, Rosalynn Hughey, Kim Walesh, Jim Ortbal, Scott Green, Ragan Henninger, City of San José Staff, PwC, and WBCSD Sustainable Lifestyle. 2018. "Climate Smart San Jose: A People-Centered Plan for a Low-Carbon City." San José. http://www.sanjoseca.gov/ClimateSmartSanJose.

San José State University. n.d. "Sustainable Cities Initiative." http://www.sjsu.edu/sustainable-cities.

SDSN. 2017. "Counting on the World: Building Modern Data Systems for Sustainable Development." https://www.sdsntrends.org/research/2017/9/17/counting-on-the-world-2017.

SDSN. 2016. "Getting Started with the SDGs in Cities: A Guide for Stakeholders." http://unsdsn.org/wp-content/uploads/2016/07/9.1.8.-Cities-SDG-Guide.pdf.

SDSN. n.d. "USA Sustainable Cities Initiative (USA-SCI)."http://unsdsn.org/what-we-do/solution-initiatives/usa-sustainable-cities-initiative-usa-sci/.

SDSN TReNDS. n.d. "Local Data Action." https://www.sdsntrends.org/local-data-action.

Stanford Sustainable Urban Systems Initiative. n.d. "SDG Dashboard for San José." http://sdg-stanford.opendata.arcgis.com.

STAR Communities. n.d. "Our Framework." http://www.starcommunities.org/about/framework.

The Baltimore Goals for Sustainable Development, University of Baltimore, and SDSN. 2016. "Baltimore's Sustainable Future: Localizing the UN Sustainable Development Goals, Strategies and Indicators." http://sdgfunders.org/reports/baltimore-s-sustainable-future-localizing-the-un-sustainable-development-goals-strategies-and-indicators.

U.S. Office of Management and Budget, Office of Information and Regulatory Affairs –U.S. Department of State Office of International Organizations, U.S. General Services Administration, and U.S. Office of Science and Technology Policy. n.d. "Measuring America: U.S. Statistic for Sustainable Development." https://sdg.data.gov.

UN Statistics Division. 2018. "SDG Indicators." 2018. https://unstats.un.org/sdgs/indicators/indicators-list.

University of Baltimore. n.d. "Sustainable Cities Initiative." http://www.ubalt.edu/about-ub/sustainable-cities.

University of Baltimore. 2015. "USA Sustainable Cities Initiative Launches in Baltimore, with UB Named as Lead University Partner." November 6, 2015. http://www.ubalt.edu/news/news-releases.cfm?id=2357.

Towards a Transdisciplinary Superfund Research Center at the University of Louisville

Jamar M. Wheeler, MA
Lauren C. Heberle, PhD
University of Louisville Superfund Research Center, Community Engagement Core
Department of Sociology and Center for Environmental Policy and Management

Abstract

The University of Louisville's Superfund Research Center (ULSRC) engages in transdisciplinary scholarship focused on volatile organic compounds and their impacts on human health. Transdisciplinary scholarship creates new knowledge and solutions to problems through collaborative research that includes academic researchers across disciplines, community members and relevant stakeholders. This type of research practice is necessary to solve many environmental health problems. This article highlights the ULSRC Community Engagement Core's (CEC) efforts to build multi-directional lines of communication and collaboration between ULSRC investigators and community members that are required to support transdisciplinary research. Still early in our efforts, we share elements of ULSRC CEC's vision, our preliminary observations and achievements, and our future trajectory.

Introducing the UofL Superfund Research Center Community Engagement Core

The University of Louisville's Superfund Research Center (ULSRC) joined the nationwide network of centers funded by the National Institute of Environmental Health Sciences (NIEHS) Superfund Research Program in the fall of 2017. The ULSRC principal mission is to become the "go to" source for research and information about volatile organic compounds (VOCs) and their impacts on human health. The ULSRC plans to carry out this mission in a transdisciplinary manner which means forging collaborative ties between academic researchers and community stakeholders. To do this, the ULSRC Community Engagement Core (CEC) is tasked with building the collaborative capacity of *both* investigators and community partners through effective community engagement activities. As part of an iterative learning process, we reflect on the team's journey thus far sharing our preliminary observations, some practical experiences, lessons learned, and our future aspirations.

The definition of what constitutes transdisciplinary research remains contested. However, there is agreement that transdisciplinary scholarship is an inclusive enterprise, inviting the participation of scholars from a variety of academic disciplines as well as participants outside of the academic sphere, whether they are involved in public policy, serve as government officials, represent organizations, or are concerned residents (Brandt et al., 2013; Brown, Harris, & Russell, 2010; Choi & Pak, 2006; Stauffacher, Walter, Lang, Wiek, & Scholz, 2006). Broad inclusion of multiple knowledge bases is necessary because the scope of many research problems, specifically environmental problems, transcend a singular disciplinary focus, and therefore, requires collaboration by practitioners from varied backgrounds to effectively address the challenges posed (Choi & Pak, 2006; Stauffacher et al., 2006). The field of environmental health sciences in general, and the ULSRC's focus area of VOCs in particular, need transdisciplinary approaches given the breadth of issues involved.

Community-engaged research is a principal component of transdisciplinary scholarship, centered on forging mutually beneficial partnerships between researchers and community members and stakeholders. While there are several approaches to community-engaged research and scholarship, core principles include but are not limited to: treating community stakeholders as equal partners; maintaining awareness of community values and expectations; recognizing community needs; and supporting community interests (Cairns, 2005; Israel et al., 2010; Mikesell, Bromley, & Khodyakov, 2013). Transparency by the research team members allows for shared understanding across differentially positioned groups and helps prevent disappointment and confusion on the part of community stakeholders (Mikesell et al., 2013). Lastly, implementing community engagement principles when academic researchers engage with economically-disadvantaged communities, racial and ethnic minority populations, and other vulnerable groups can mitigate distrust developed over time that is often based on instances of real harm from historical research practices (Israel et al., 2010). Shared decision-making, mutual respect, and transparency are all necessary components of best practices in community-engaged research. Research partnerships that successfully incorporate these have the potential to yield mutual benefits that are relevant to the parties involved: researchers seeking to meet study participation and other research goals; concerned residents seeking accurate and relevant environmental health risk information they can act on; and decision-makers responsible for implementing policy solutions.

The ULSRC CEC spent our first year building basic infrastructure required to facilitate collaborative ties between researchers and community members (stakeholders, practitioners, and residents) and assess, monitor, and advance the capacity of researchers and community members to engage with one another effectively. We choose to meet ULSRC investigators and community members "where they are." To do so, we assess their current understanding of community-engaged research and the role they, both investigator teams and community members, think they should play in ULSRC projects and activities. We host public Community Knowledge Exchange (CKE) sessions to introduce investigators and community members to each other and provide a general introduction to VOC research. These meetings also serve as a recruiting venue for potential members of the ULSRC Community Advisory Board (CAB). The CKE sessions provide an informal venue for ULSRC investigators and community stakeholders to freely interact, get to know each other face-to-face, and create a platform on which trust can be built, while ensuring learning opportunities remain at the forefront.

The first CKE event focused on introducing the ULSRC to four research projects. During this session, groups of participants moved between four different tables in 15-minute increments to hear principal investigators share brief descriptions of their projects and ask questions. This provided the opportunity for small-group and one-on-one interactions. The second CKE centered on the question *'What are VOCs?'* and featured an informal panel of ULSRC researchers who were asked to present their work in more detail in an informal discussion format so that they could interact more directly with the attendees and answer questions directly. The third CKE focused on hearing about the most pressing environmental health concerns from community attendees.

As a consequence of these learning sessions and the level of engagement they inspired, we successfully recruited volunteers to form the ULSRC Community Advisory Board (CAB). The CEC intentionally used the public CKE sessions to identify individuals with interest and expertise who may not otherwise have been known to ULSRC investigators. This expanded our reach into the community for CAB participants. As a result, the CAB is demographically diverse, includes individuals with ties to environmental advocacy groups, representatives from local government agencies, and concerned citizens without formal organizational ties. The CAB members drafted and reviewed a strategic vision for the advisory board that was also reviewed by ULSRC investigator teams. The ULSRC CAB declared its mission is to "serve as a bridge between communities and the ULSRC." Additionally, the CAB will promote collaborative exchanges that "inform communities about important research findings and researchers about community-based realities." As these exchanges mature, the goal is to enhance the relevancy of investigators' research and CAB members' knowledge so that they can all better communicate vital information related to health risks and prevention and inform public policy.

Concurrent with our efforts to host knowledge exchanges and form an advisory board, the CEC examined investigator and community member understandings of, and capacity for, community-engaged research using participant observation methods and event evaluation questionnaires to document interactions at those events along with internal investigator team meetings and discussions.

Methods

We employ multiple methods to uncover investigator and community member perceptions and knowledge of community-engaged research and to elicit feedback regarding our efforts including: a pilot survey/event evaluation instrument, open-ended questionnaires, focus group-like assessments of communication materials, and participant observation. We distributed a pilot survey/questionnaire to both ULSRC investigators and community members who attended the CKE sessions. The items in the survey covered subjects such as the quality of the particular event, general community engagement preferences and experiences, and perceptions of the University of Louisville's past community engagement efforts. Open-ended questionnaires distributed to investigators captured their perceptions of community engagement and whether they include community engagement in their research objectives in their own words. Community members were asked

Figure 1. Community-Engaged Research Types

Types of Community Engagement in Research
1. Delegate: give the decision authority to the community to drive research topics and methods
2. Partnership: partner with the community; make decisions together
3. Consultation: gather public input; may not use the input
4. Information: provide information to community
5. Proforma: Investigator's decisions are already made. Engagement is perfunctory

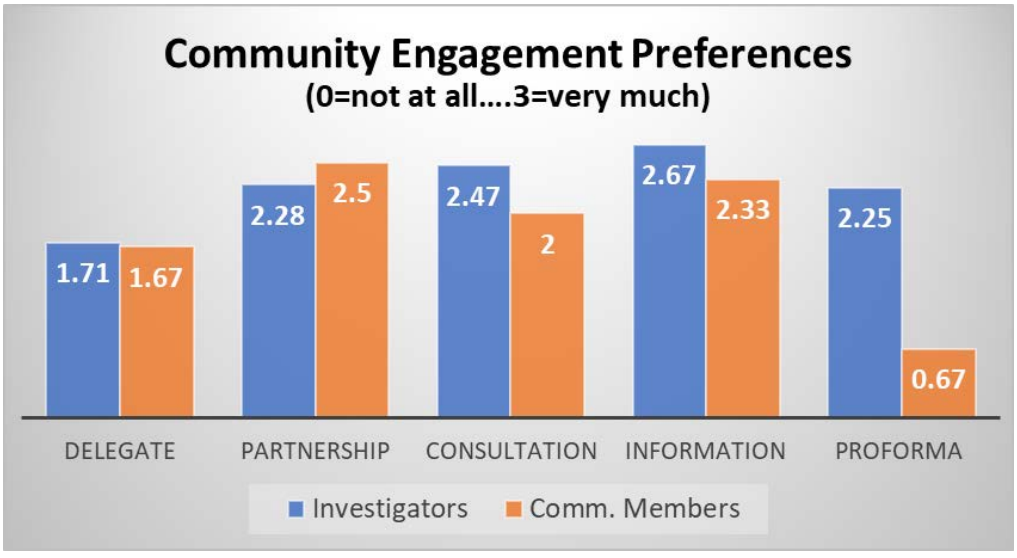
to review public education materials about VOC sources and health impacts using a focus-group format during one of the CKE sessions. In addition to the information collected through the CKE sessions, we observed and documented group and peer-to-peer interactions, conversations, and presentations as participants in numerous internal ULSRC investigator team meetings and presentations, as well as the CAB meetings. Our qualitative observations contribute to our ability to critically assess the ULSRC community engagement capacity. This combination of research and evaluation methods allows us to assess and monitor progress toward and achievement of milestones that we deem necessary to establish a transdisciplinary research program in which investigators and community members can collaborate effectively across disciplinary, organizational, and social boundaries.

What Have We Learned So Far?

Our preliminary observations reveal several areas of strengths and areas of growth that we will need to address as a team if we are to reach a goal of effective collaboration, a crucial component of a transdisciplinary research center. A key question in the pilot survey asked respondents to indicate preferences on a scale of 0 to 3 (with 0=to not at all and 3= 'very much') for different types of community-engaged research (Figure 1). Community member respondents show a preference for *Partnership* with researchers where as investigators indicated a preference for uni-directional engagement in which they provide *Information* to community members. Both groups showed a lower preference for *Delegating* research decisions to community members. The largest gap between the two groups is evident in investigators' much higher level of preference for *Proforma* engagement in which research decisions are already made and the engagement is simply a requirement to be fulfilled (Figure 2). Even though the respondents indicated a difference in how they ranked engagement types, there was certainly enough overlap in *Partnership*, *Consultation*, and *Information* types that suggest these forms of community engagement could be successful and supported by the community members and investigators in attendance. The results suggest both community members and investigators prefer investigators to be ultimately responsible for making research decisions, neither want community members in that position. However, they also suggest that both prefer research that engages and includes community members in a variety of ways.

The open-ended questionnaire distributed to investigators provides insights into the most prevalent perceptions of community engagement among investigators and what role community engagement plays their research objectives. While a few investigators demonstrated a fuller understanding of community engagement in alignment with principles such as transparency and supporting community interests, the majority demonstrated just a basic understanding of community engagement. This was evident in their statements about community engagement that repeated language used in CEC team materials we distributed and by their comments indicating that the scope of community-engaged research is limited to unidirectional communication and events in which information is provided to the community or feedback is received from the community. Many investigators described community engagement as peripheral to their research, indicated

Figure 2. Community Engagement Preferences (Investigators/Community Members)



that community engagement had a minimal effect on their everyday activities, and expressed a sense of contentment with this arrangement. Because most investigator responses indicated at least a basic understanding of community engagement, we see an opportunity to augment the investigators' knowledge base. However, their responses did not overwhelmingly indicate a desire to change current practices. This said, because investigators voluntarily attend the CKEs and, in discussions, communicate the value of community-based knowledge, this suggests that investigators may be content with their current practices, but are open to change. The CEC therefore sees the need to demonstrate research benefits of different types of engagement with the UofL investigators in order to develop deeper engagement that supports a transdisciplinary environmental health science research program. Investigators could benefit from seeing specific examples of how different types of engagement could be integrated into their research protocols. The ULSRC investigators engage in a wide variety of clinical, bench, and technological research questions, each employing different methodological practice and therefore would benefit from different types of community engagement efforts relevant to their practice. This is central to the CEC effort to meet investigators "where they are" to help make community engagement relevant to their research agendas.

It is not surprising that our observations suggest an ongoing need for well-conceived strategies for facilitating communication and understanding between community members and investigators. The daily experiences of both groups and the social networks in which they are embedded lead to different ways of communicating and thinking about research. The challenge before us is to bridge these experiences to the extent that effective collaboration becomes possible and sustainable.

We found significant communication gaps when community members reviewed and critiqued VOC educational materials and provided feedback on investigator presentations. They found some of the language to be inaccessible and complained that the information was overwhelming by exposing serious problems without offering solutions. Much of the feedback stated that the nomenclature used to indicate the presence of VOCs and other pollutants made the materials difficult to understand. While community members felt that the images were informative, if they could be understood, some expressed consternation because the materials informed them about a problem that could impact their lives, but included no information about what they could do to mitigate their potential exposure. In essence, some of the images made community members feel powerless in the face of seemingly insurmountable forces. This means that our investigators should ensure their findings include information that community members can act upon in addition to communicating their findings in accessible and relevant formats.

Through our observations and interactions with investigators, we observed that investigators are committed to their professions and tend to relate most strongly with professional peers. This impacts their ability to connect with people from affected communities, whether in face-to-face interactions or through more formal venues such as public presentations or published articles. If investigators do not have experience interacting with communities impacted by their research, their willingness and capacity to sustain engagement and respond constructively to challenging questions and suggestions from members of affected communities will be affected. Success of the CEC will hinge on our ability to facilitate *regular and intentional opportunities for engagement*, which will help investigators and residents alike to become more comfortable with each other and enhance a sense of resilience among investigators when challenging interactions inevitably occur.

Overall, our early observations of ULSRC investigator and community member participant interactions and initial assessments of their understanding and experience with community-engaged research suggest many opportunities to build on existing strengths and close some of the gaps that have been exposed. The pivotal strength is a willingness on the part of both investigators and community members to commit to a partnership approach to community engagement and the investigators' willingness to learn more. The difficult challenge the CEC will face is addressing the tension that exists between meeting the goal of building more capacity for community engagement and the pressures and professional incentives operating in the lives of investigators that inhibit their community engagement capacity. Our observations suggest for example, that the tendency of investigators to place community engagement on the periphery is likely a product of the lack of incentives for investigators to devote the necessary time and energy, especially in the face of more weighty professional pressures. The academic research system does not reward time spent in community engagement efforts. This dynamic affects investigators' modes of communication, expectations, and prioritization.

Towards Transdisciplinarity

The University of Louisville's Superfund Research Center stated in its proposal that it would carry out transdisciplinary research. In practice, this means studying toxic volatile organic compounds and their effects on human health in a manner that is inclusive of diverse academic disciplines and concerned stakeholders outside of academia. The practical significance of such a proposal lies in the acknowledgement that the research problem transcends the expertise of academic disciplines and requires the collaborative efforts of stakeholders across a variety of sectors and standpoints in order to produce useful knowledge that can be implanted in policy and practice to improve health outcomes. Effective community engagement is a key component of transdisciplinary scholarship and requires building ties between researchers and concerned community members.

Launching the UofL Community Engagement Core has involved practical work to develop structures and practices

that facilitate collaboration between ULSRC investigators and community members and conducting research that helps us better understand our ULSRC investigators' and interested community members' baseline capacities to fruitfully engage with each other. Our preliminary observations suggest that there is promise with respect to the willingness of investigators and community members to collaborate as partners in the ongoing research, but this willingness may be curtailed by existing social boundaries between the two and the daily realities and pressures each face. Ensuring that the ULSRC develops into an effective transdisciplinary enterprise will depend on focused efforts to build regular communication platforms and opportunities between investigators and community members and identifying incentives for investigators to include community engagement as an integral part of their research strategies. Both UofL investigators and our community participants will need to experience benefits from these interactions so that they will contribute toward developing new knowledge and solutions to the negative health impacts of toxic VOC exposures. We look forward to reporting on our progress as we open new paths for transdisciplinary environmental health science research at UofL.

UofL Superfund Research Center Community Engagement Core is on the web at louisville.edu/cepm and louisville.edu/enviromeinstitute/superfund.

Follow us on Facebook @CEPMUofL and on Twitter @CepmUofL.

Documents related to the ULSRC Community Advisory Board and their meetings will be found at louisville.edu/cepm/superfund-center-project.

References

Brandt, P., Ernst, A., Gralla, F., Luederitz, C., Lang, D. J., Newig, J., . . . von Wehrden, H. (2013). A review of transdisciplinary research in sustainability science. *Ecological Economics, 92*.

Brown, V. A., Harris, J. A., & Russell, J. Y. (2010). *Tackling wicked problems through the transdisciplinary imagination*. London ;: Earthscan.

Cairns, K. (2005). *Public Involvement: How Active Participation in Environmental Issues and Decisions Makes Economic Sense and Broadens the Knowledge Base*. Louisville: UofL Center for Environmental Policy and Management.

Choi, B. C., & Pak, A. W. (2006). Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. *Clin Invest Med, 29*(6), 351-364.

Israel, B. A., Coombe, C. M., Cheezum, R. R., Schulz, A. J., McGranaghan, R. J., Lichtenstein, R., . . . Burris, A. (2010). Community-Based Participatory Research: A Capacity-Building Approach for Policy Advocacy Aimed at Eliminating Health Disparities. *American Journal of Public Health, 100*(11).

Mikesell, L., Bromley, E., & Khodyakov, D. (2013). Ethical Community-Engaged Research: A Literature Review. *American Journal of Public Health, 103*(12).

Stauffacher, M., Walter, A. I., Lang, D. J., Wiek, A., & Scholz, R. W. (2006). Learning to research environmental problems from a functional socio-cultural constructivism perspective: The transdisciplinary case study approach. *International Journal of Sustainability in Higher Education, 7*(3).

Los Angeles Sustainable Development Goals
A Voluntary Local Review of Progress 2019

Eric Garcetti
Mayor, Los Angeles

This report, our first voluntary local review of progress toward the Sustainable Development Goals in the City of Los Angeles, shows that cities are where things get done. While the goals offer a shared lens through which we can view our work here in Los Angeles and in cities and countries around the world, the Goals also help us measure the prosperity of our workers, the growth of our businesses, and the legacy we leave for the next generation.

This April, I shared our Green New Deal, an update to our Sustainable City pLAn that provides a global model for local action to confront the climate crisis. Like the SDGs, its goals are ambitious, including reaching carbon neutrality and zeroing the amount of waste sent to landfills by 2050. And at a global level, the Green New Deal embodies the integrated and indivisible nature of the 2030 Agenda, and the truth that nothing is sustainable without equity and justice.

This voluntary local review is both a chance to share what is working in Los Angeles, and an opportunity to ask for help with what is not. So, whether you are reading this in Boyle Heights or Benin, please join us on this path to collectively realize the world we want.

I want to thank the Conrad N. Hilton Foundation, which has tirelessly championed the Sustainable Development Goals and catalyzed our work to locally implement the SDGs in Los Angeles. I would also like to extend my sincere thanks to the Mayor's Fund for Los Angeles, the Sustainable Development Solutions Network, and our dedicated academic partners at Occidental College, Arizona State University, the University of California at Los Angeles, and the University of Southern California.

Working together, I know we can achieve a more sustainable, equitable, and just future.

— Mayor of Los Angeles Eric Garcetti

Executive Summary

In the fall of 2015, the member states of the United Nations unanimously adopted Agenda 2030, a resolution outlining 17 Sustainable Development Goals to guide collective action over the next 15 years. The ensuing campaigns to raise awareness and engage the public acknowledged the importance of local actors in achieving progress. But few anticipated that cities would adopt – and adapt – the Goals as their own. In 2017, with the generous support of the Conrad N. Hilton Foundation, Mayor Eric Garcetti announced that the City of Los Angeles would align our work to this global development agenda.

By adopting the SDGs, Los Angeles is taking an active role in measuring ourselves as part of the global community's collective impact. Over the past 18 months, this work has allowed us to embrace a common language with other cities, and to share data, methodology, and lessons learned. Most importantly, it has provided another way for us to evaluate our own efforts to improve the lives of Angelenos.

This report summarizes our efforts to date, highlighting the contributions of our partners, how we got started, what we've learned, and where we plan to go next. We are also excited to share two online resources that further detail our ongoing efforts to capture SDG-relevant activities underway throughout the City of Los Angeles and our surrounding communities. These resources include a new website that will build out an index of both City and community SDG-aligned activities and a Local Data Reporting Platform that sources and visualizes data responding to the SDG indicators. This report is intended both to honor the commitment of Agenda 2030 to conduct regular and inclusive reviews of progress at the national and sub- national levels, and to engage our own community in this pursuit. We hope that this report and these platforms provide an opportunity to showcase and make new connections that further the future we want for Los Angeles and the world.

Please reach out with your SDG stories at sdg.lamayor.org, and see how we are measuring progress toward the Goals at sdgdata.lamayor.org.

Our experience in Los Angeles has highlighted three truths about the Sustainable Development Goals that both inform and reinforce our approach to implementation. First, individual goals offer the chance to bring communities of interest together to measure and evaluate what is working, but true implementation must be holistic, as the Goals are dynamic and interdependent. As the preamble to UN Resolution 70/1 adopting Agenda 2030 states, the Goals "are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental."

Integrated and indivisible, the SDG framework helps consider the various interdependent challenges we face as a City. A target like 8.6, which aims to "substantially reduce the proportion of youth not in employment, education or training" by 2020, has connectivity to other targets in SDGs 1, 4, 5, 9, 10, 16, and 17. Understanding how targets intersect with root causes and effects has been useful as we study progress, trends, and opportunities.

Second, cities have become the agents of change for realizing the Goals because the interdependence of the SDGs requires an understanding of local externalities and how to address them. Though some SDG targets speak to upholding international commitments made by national governments, many more hinge on local context, and by extension — local governance — to realize progress. As an example, SDG 3.6 aims to halve the number of global deaths and injuries from road traffic accidents by 2020. This target demands a hyper-local understanding of where and why accidents may be happening in order to take action.

Cities are where everyday work is done; from the provision of water, power, and trash collection to the planning and zoning decisions that shape an urban footprint. But city governments cannot achieve the SDGs alone. Partnerships across the public, private, and non-profit sectors are essential to how we operate in Los Angeles, and they are essential to achieving the SDGs.

The third truth, which follows from recognizing the SDGs as both interdependent and centered in community-led change, is that nothing is truly sustainable without justice and equity. Resilient L.A., our plan to prepare for and protect against the shocks and chronic stresses that may impact our City, asserts that "building a more resilient Los Angeles starts with addressing the needs of our most vulnerable populations and neighborhoods." Likewise, the first chapter of L.A.'s Green New Deal, our 2019 Sustainable City pLAn, is focused on environmental justice. More than 84 initiatives, all mapped to the SDGs they support, speak directly to achieving greater equity as part of our transformation, ensuring no one is left behind.

The Sustainable Development Goals are about building the world we want. The work we do on all three fronts — for people, the planet, and prosperity — is deeply connected. We welcome everyone, particularly our neighbors here in Los Angeles and our partners in cities around the world, to join us as part of this shared agenda.

Introduction: Why the SDGs in L.A.?

Why has Los Angeles aligned themselves to the Sustainable Development Goals, and why should other cities consider doing the same?

First, because by adopting the SDGs, **Los Angeles is a part of the global community and part of the shared agenda for progress**. Angelenos speak more than 220 different languages — we are already citizens of the world. As Mayor Garcetti has said, our community knows there is no dichotomy between meeting local needs with one hand and serving a global purpose with the other. Angelenos also recognize that sustainable development is not just something that happens in faraway places, but what is happening in our own neighborhoods. The SDGs are about us, and they start at home.

The mapping informed the **second phase of implementation — an analysis of where gaps may exist** when considering the City's activities mapped to the SDGs. Given that this mapping was supported by passive research, engaging with policy owners was critical to differentiate a true gap from an absence of published information.

Third, through this work, **we embrace a common language with other cities**, both international and domestic, to share data, methodology, and lessons learned. This is not new, but it is new for cities to together embrace an international language like the SDGs. This collective language makes it easier to seek out ways to share our data, methodology, and lessons learned, and to measure our collective impact. This common language extends beyond cities to support our connections with public, private, and non-profit sector partners.

Fourth, measuring our progress on the SDGs helps us to be more data-driven and transparent, to find new or disaggregated sources of information and continue to ensure that progress is distributed and equitable. And even if that data shows us that news isn't good, highlighting areas that need improvement can be an opportunity to activate new solutions, to test new ideas, and to bring in new partners. This accountability becomes part of a broader dialogue within our community on how to make progress in Los Angeles that leaves no one behind.

Methodology: How to Implement the SDGs at a Local Level

An obvious first step was to understand how existing plans and policies aligned to the Goals. This mapping exercise became the first of four phases enacted by the Mayor's Office to advance the SDGs in L.A.

This **first phase** — **Mapping and Alignment** — produced a baseline of current "activity," broadly defined as any plans, policies, initiatives, measures of impact, services, or business areas that related back to a Goal or its subordinate targets. This

assessment was critical for several reasons: to identify the internal and external policy owners and stakeholders for each SDG target, to understand what progress had already been made, and to identify where challenges remained.

The Mapping informed the **second phase of implementation** — an analysis of where shortfalls or gaps exist when considering the City's activities mapped to the SDGs. Given the fact that university students used mostly passive research for phase 1, engaging with policy owners was critical to differentiate a true gap from an absence of published information. The resulting analysis shone a light on where certain SDG targets, like those related to public health, are governed by L.A. County, rather than the City.

This raised the question: should the City include Goals for which it does not have primary jurisdiction? Should the City actively monitor and track its own progress on SDG 3 or defer to the County? And what about the targets that clearly speak to nation-level authorities rather than local ones?

The need to add local context to the 169 targets through revisions to the language or to the measures themselves became the **third phase of implementation**. The notion of localizing the SDGs has evolved from implementing the SDGs at a local (i.e., subnational) level to adapting the SDGs, their targets, and indicators to fit a local context and setting. Localization should ensure that a community's priorities, needs, resources, and people are at the center of its sustainable development.

In Los Angeles, this third phase entailed validating revisions to the framework with stakeholders, while continuing to map and analyze corresponding indicators and data sources. Simply put, now that we had identified a target, we could decide how best to locally measure it. This alignment of data to the framework will provide another quantitative baseline on our progress toward the Goals, and more insight into where we may be able to accelerate. Even where the data shows success, we will want to ensure that when disaggregated by demography and geography, success is equitably distributed across our entire community.

Mobilization draws on our cumulative work to identify new ideas, new partnerships, and new initiatives that may foster progress. As we begin to scope these mobilization efforts, we also want to recognize innovative efforts outside the City and the public sector, and source great ideas from all of our neighbors here in the creative capital of the world. In this mobilization phase, it will be critical to engage across sectors and share what we have learned with stakeholders. This will deepen our collective understanding of effective activities and essential data related to key targets. Consistent throughout all four phases of our work has been and will continue to be a commitment to share the experience with our partners throughout Los Angeles and the world.

The City of L.A. is excited to partner with other cities interested in implementing the Goals, and with equity-minded organizations exploring their alignment to this agenda. Reporting on our progress is not only a means of transparency and accountability, but also a platform for outreach to others working on a particular Goal or target. This Voluntary Local Review process is itself an opportunity for the City to partner with other global cities on our respective methodologies and lessons learned.

We believe taking the initiative to voluntarily report our progress demonstrates L.A.'s commitment to this agenda, and to our place in the global community. It signals the importance of recognizing how cities contribute to the dialogue on sustainable development, and the direct role we play in furthering this collective agenda. In the years ahead, we hope that the conversation on how cities are localizing the Goals will be a prominent part of national voluntary reporting.

How L.A. Added Local Context to National and International Targets

As referenced earlier, our third phase of implementation speaks to localizing the SDGs with context for the City of L.A. This localization effort was initiated by the 18 graduate and undergraduate students who spent the summer of 2018 working to gather data and map activities on the SDGs across the public, private, and non-profit sectors in Los Angeles.

University partners, including Dr. Sanjeev Khagram, the former Chair of the John Parke Young Initiative on the Global Political Economy at Occidental College (Oxy) and current Dean of the Thunderbird School of Global Management at Arizona State University (ASU), have been critical to L.A.'s work to achieve the SDGs. Both Oxy and ASU have provided support for numerous classes, symposia, and dedicated students to this work, as have the WORLD Policy Analysis Center at the University of California at Los Angeles (UCLA), and the Institute on Inequalities in Global Health at the University of Southern California (USC).

Enabled by their universities and grant funds from the U.S. Sustainable Development Solutions Network's Local Data Action-Solutions Initiative, the students began their work by asking questions about the local relevance of all 169 targets. This discussion quickly expanded to whether or not the City intended to track targets for which it did not have primary jurisdiction, resources, or authority.

As such, the students needed to determine if the City could implement the 169 SDG targets as adopted. They created a methodology for determining the applicability of a target for the City of Los Angeles, and then proposing revisions or additions to the framework that reflect local context. These revisions largely adhered to one of three criteria: first, the target referenced an

LOCALIZING THE SDGS:
Revising National Targets for the City

A first step toward implementing the Goals for L.A. has been to examine each target to determine if it applies to this City, and if not, revising it while maintaining its original intent. Adding this local context to the SDG targets allows our City to share in this global agenda. The methodology that follows was produced by students with support from the Sustainable Development Solutions Network's Local Data Action - Solutions Initiative, and will be validated by the City in the coming months.

OUR APPROACH

STEP 1: SORT
Consider whether the target as written is applicable for the City or not.

STEP 2: "THE GOLDEN RULE"
For those not applicable, determine which targets may be applicable with revisions to the language or context, taking into consideration the original intent and vision.

STEP 3: REVISE OR REPLACE
Alter the target language as appropriate, revising the measure or language to reflect our local values and context.

STEP 4: NEW TARGETS
Develop new targets to ensure we leave no one behind.

STEP 5: VALIDATION
Validate the revised targets by ensuring alignment with existing City commitments and by coordinating with policy owners and community stakeholders.

OUR PROCESS

The following rubric was created to categorize the revised targets.

0 NOT APPLICABLE
This SDG target does not apply at the local level.
EXAMPLE: SDG 10 - REDUCE INEQUALITIES (TARGET 10.5):
Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations.

1 LITERAL
The SDG target as written applies to the City of Los Angeles.
EXAMPLE: SDG 3 - GOOD HEALTH & WELL-BEING (TARGET 3.5):
Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.

2 TARGET REVISED
The SDG target as written does not apply, but can be revised to apply to the City of Los Angeles.
EXAMPLE: SDG 6 - CLEAN WATER & SANITATION (TARGET 6.A):
By 2030, expand ~~international~~ cooperation and capacity-building to support ~~developing countries~~ **local and community** efforts related to water - and sanitation activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

3 TARGET REPLACED
The SDG target as written does not apply, but can be replaced with a target for the City of Los Angeles with similar intent.
EXAMPLE SDG 8 - DECENT WORK & ECONOMIC GROWTH (TARGET 8.10): Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance, and financial services for all.
REWRITTEN: Encourage the expansion and greater access for all to banking, insurance, and traditional and emerging financial services.

4 TARGET ADDED
A new target should be added for the City of Los Angeles.
EXAMPLE SDG 5, TARGET 5.x:
End all forms of discrimination against LGBTQIA+ persons and ensure that LGBTQIA+ persons have equal access to services, education, and employment opportunities.

authority or process not applicable for a city in the United States or conversely, did not reference local authorities; second, the target set a numerical measure not appropriate for Los Angeles; third, the language of the target was not inclusive in recognizing all persons in Los Angeles.

This methodology may be used by other sub-national entities to localize the SDGs while staying true to the intent of the target as adopted. A revision that drifts too far from the intent of the Goals will limit its efficacy as a shared, common language, and otherwise compromise our ability to measure collective impact.

The critical final step of this methodology includes coordination to validate the proposed revised targets with the appropriate policy owners within the City, County, and other governance bodies. This process is ongoing. The SDG narratives throughout this document and in the appendix capture the mapping of activities within the City of L.A. to these proposed, revised targets — though some may change in the future. Once the revised targets are validated by the Mayor's Office, the framework will become the basis for the City's work to identify appropriate indicators and data sources by which to evaluate and share its progress on the Goals.

UNIVERSITY OF
LOUISVILLE®

Christina Lee Brown Envirome Institute
University of Louisville School of Medicine
Division of Cardiovascular Medicine
580 S. Preston Street
Louisville, KY 40202