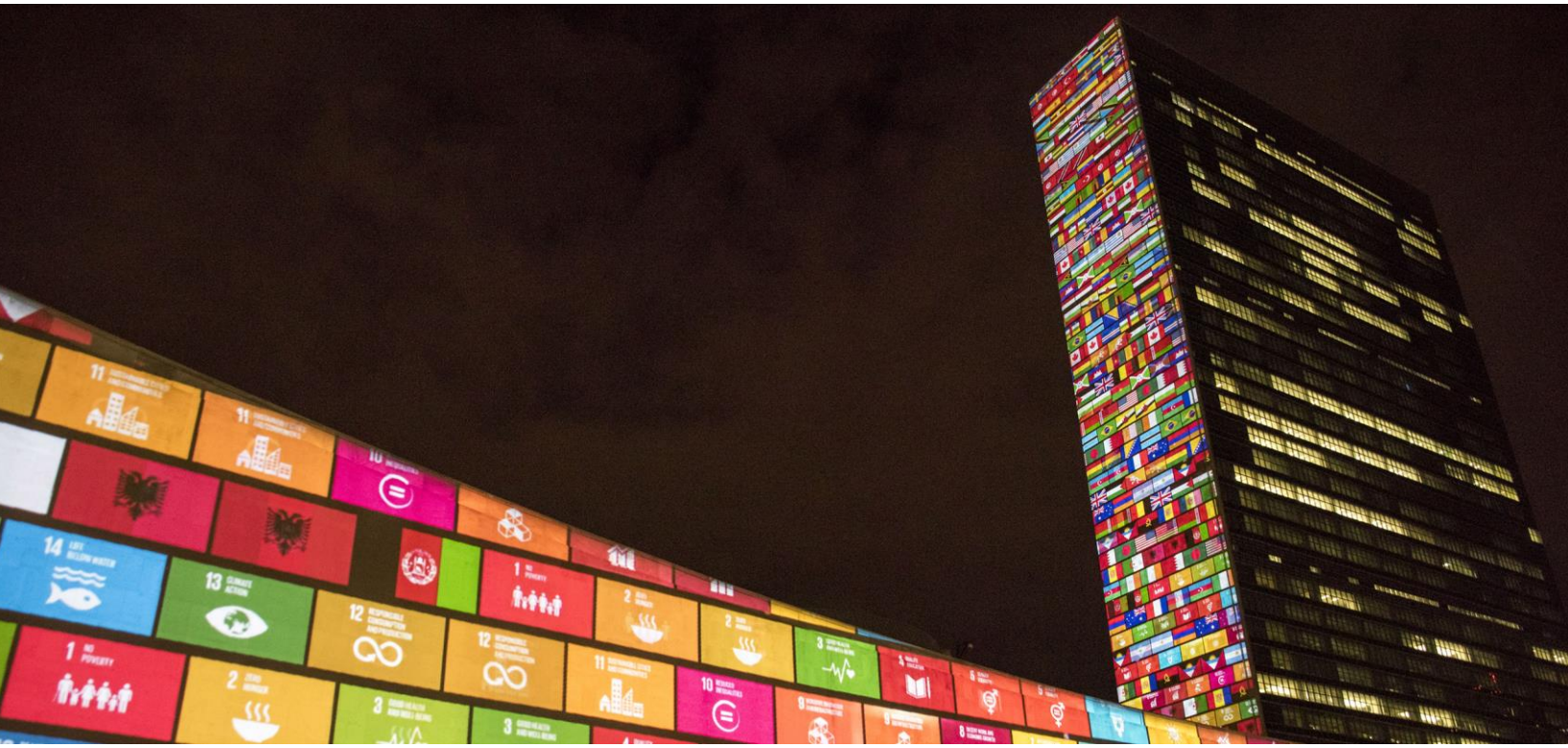

RESEARCH REPORT

Hacking the Sustainable Development Goals

Can US Cities Measure Up?

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Introduction

At a historic summit in September 2015, all 193 member countries of the United Nations unanimously adopted a global framework to guide progress on sustainable development over the next 15 years. The 2030 Agenda for Sustainable Development (2030 Agenda) includes 17 Sustainable Development Goals (SDGs) and 169 targets that cover a broad range of ambitious global aspirations—from ending poverty and hunger to achieving universal access to clean energy and combatting climate change (UN 2015).[1] The SDGs are designed to address the world's most urgent sustainable development challenges by aligning the priorities of governments and private partners around a set of common goals and targets, developing shared metrics to measure progress, and creating new platforms to exchange knowledge and support effective solutions. Dozens of countries have already reported on early progress in implementing the SDGs through a voluntary review process, and annual meetings of the United Nation's (UN's) High-Level Political Forum will focus on assessing global progress on a different set of SDG goals every year until 2030.[2]

Though the SDGs were designed and adopted by national governments, there is a growing consensus that subnational progress will be essential to their success, especially in the urban areas that will absorb virtually all population growth in developing countries in the decades ahead. In almost all countries, performance across cities varies dramatically. In the United States, for example, some of the largest metropolitan areas do very well in relation to the SDGs, but others do very badly (Prakash et al. 2017). If policymakers (at all levels) do not have data on differences in performance, they will have no basis to target resources in ways that will advance the achievement of the goals.

And, indeed, city leaders are embracing the SDG framework to help them understand and drive local progress on sustainable development. Even before the SDGs were finalized, mayors and local leaders successfully pushed for a dedicated goal to "make cities inclusive, safe and resilient and sustainable" (goal 11) through the global Campaign for an Urban SDG.[3] Since then, dozens of mayors and local leaders from across the globe have committed to support progress across all SDG goals in their cities (GTF 2016b).[4] In some countries, such as Colombia, Germany, and South Africa, national ministries encourage local authorities to align urban development plans with the SDG targets and provide tools and resources to facilitate this process.[5] In the United States, the Sustainable Solutions Development Network (SDSN) is working with universities, local governments, and community-based organizations in three pilot cities to develop SDG-based sustainable development strategies.[6] City leaders are also forming new global networks and developing new online platforms to provide tools for

"localizing" the SDGs and share lessons learned from local SDG implementation strategies (UCLG 2017).[7]

This momentum reflects a growing consensus that cities are where sustainable development challenges like poverty and disaster risk are felt most acutely, particularly as the world's population shifts to urban areas (Lucci et al. 2016; UN 2014). Cities can be incubators for the policies that address sustainable development challenges, and local leaders hold the keys to fostering inclusive growth and mitigating climate change. City governments are also increasingly responsible for delivering the services and setting policies across diverse areas that effect the daily lives of their residents, such as health, education, infrastructure, transportation, land and resource management, and economic development (Boex 2015; GTF 2016a). Indeed, it is hard to imagine making significant global progress on the SDGs by 2030 without the active involvement of local leaders in cities.

Yet significant challenges persist. Though the UN recognizes that responsibility for implementing the 2030 Agenda is a shared across all levels of government (as well as across public, private, and nonprofit sectors), the SDG framework is designed for national implementation and monitoring. The official indicators that the UN has developed to measure progress on the SDGs are designed for reporting at the national or regional (supranational) levels and focus on national and regional statistics.[8] Although the UN Statistical Commission encourages national governments to develop their own subnational indicators whenever possible, few have done so.[9] According to a recent review of the 63 national SDG progress reports that UN member countries have submitted to date, only 37 countries consulted with local governments in preparing their reports, and only 27 countries mention either existing efforts or plans to disaggregate data to track subnational progress (UCLG 2017). Local governments also do not have a role in the annual High-Level Political Forum, so they are not represented in the UN's formal SDG monitoring process.[10] And, in many countries, local governments do not have the legal authority to adopt policies related to many of the SDG goal areas or the flexibility to redirect resources to achieve them (Edwards, Greene, and Kingsley 2016).

Thus, to drive local progress on the global 2030 Agenda and then use it to generate local solutions to sustainable development challenges within their borders, city leaders will need to "hack" the SDGs.[11] They will need to raise awareness about how the SDGs can support progress across a range of local priorities. They will need to find ways to translate a complex framework that includes 17 goals, 169 targets, and 232 indicators into locally relevant plans and strategies and recruit local partners to help implement them. And they will need to find ways to participate in a global monitoring and accountability process that was not designed for them.

Sixty-one percent of the 169 SDG targets are relevant to US cities, and 66 percent of these relevant targets are measurable across the nation's largest cities and metros using publicly available data sources.

This report focuses on a particular challenge that city leaders face in hacking the SDGs—data. Gaps in data that are generated locally or disaggregated from national sources to the local level are widely perceived as one of the main obstacles for cities to engage in the SDGs (Edwards, Greene, and Kingsley 2016; Klopp and Petretta 2017).[12] Without reliable local data, city leaders will not be able to establish baselines to understand current performance or assess future progress on SDG goals and targets. And without SDG indicators relevant to cities, city leaders cannot compare performance with each other, identify areas for improvement, or use the SDGs to learn from peers about what works. Civil society groups outside of government need open and accessible local data to hold municipal leaders accountable for progress on the SDGs, sharpen their advocacy, and target their programs and services. Higher levels of government also suffer from local-data gaps, and without comparable local data they are not able to detect regional differences in progress on the SDGs or direct resources to the people and places that need them most.

In this report, we investigate whether data are available to measure progress on the SDGs in urban areas in the United States. To date, most of the research to understand the availability of local data to measure progress on the SDGs in cities has focused on data gaps in developing countries (Lucci et al. 2016; Lucci and Lynch 2016). In a few cases, researchers have attempted to compare local data sources available to track progress on the targets under goal 11 (on sustainable cities) across both developed and developing countries (Simon et al. 2016).[13] Within the United States, however, we know little about whether data gaps will impede city leaders' progress on the SDGs. And if so, we know little about how to go about filling them. The US Office of Management and Budget (OMB) has created and launched a National Reporting Platform (NRP) to supply data and track progress over time on the official UN SDG indicators.[14] However, the NRP only includes national data sources and does not indicate which sources could be disaggregated to compare progress and track trends across US cities. SDSN has recently developed a US Cities SDG Index that synthesizes data and ranks the 100 largest US metropolitan areas on 49 indicators across 16 of the 17 SDGs (Prakash et al. 2017). However, the indicators in the US Cities SDG Index are not keyed to individual SDG targets, and the index does not assess data gaps for measuring target-level progress across cities.

Only 19 percent of the 161 relevant UN indicators across the SDG framework are measurable in US cities or metros using existing national data sources.

We see our research as complementing and supporting these efforts. Through a review of data sources and existing research, we attempt to answer four foundational questions:

1. Which of the SDG goals and targets are relevant to US cities?
2. Which of the relevant SDG targets are measurable using existing data sources?
3. Are there significant data gaps for measuring progress in US cities across the SDG goals?
4. Is the official UN SDG indicator system useful for measuring progress in cities?

By answering these questions, we hope to help US cities "hack" the SDGs in two ways. First, our research can accelerate and inform local progress on the SDGs by identifying existing data sources that local leaders can use *now* to measure and compare performance across the SDG framework. Our analytical findings should provide momentum for efforts to track progress on the SDGs in US cities. We find that 61 percent of the 169 SDG targets are relevant to US cities, and 66 percent of these relevant targets are measurable across the nation's largest cities and metros using publicly available data sources. In our analysis, we also discovered that many targets have multiple data sources that could be used to measure and track progress on relevant SDG targets. The full list of data sources we identified is available online in our SDG Data Inventory for US Cities.[15] We provide the inventory in a downloadable Microsoft Excel file to facilitate additional analysis, adaptation, and use by researchers, community organizations, advocates and policymakers interested in implementing the SDGs in their cities or refining existing sustainable development plans to include SDG-relevant data.

Second, we identify where more work needs to be done to fill data gaps and create indicators that city leaders can use to track local progress on the SDGs. Our general findings on the availability of data at the city- or metro-level mask significant data gaps for certain SDG goals and targets. For example, we find that though the SDG targets for goals 6 (water), 12 (consumption), 13 (climate), and 16 (justice) are highly relevant for US cities, less than half of the relevant targets under each of these goals are measurable in cities or metros using existing national data sources.[16] We also find that the official SDG indicator system that the UN has developed is poorly equipped for use by city leaders in the US. Specifically, we find that only 19 percent of the 161 relevant UN indicators across the SDG framework are measurable in US cities or metros using existing national data sources. This suggests that additional

work is needed to create meaningful indicators that city leaders can use to organize available data and guide local progress.

We hope this research can support progress already under way to engage city leaders in the US in the SDGs and can be a catalyst for conversations about how to fill gaps and create the conditions for better use of data to drive local progress on the SDGs. We conclude with some specific recommendations to advance both these goals.

Methods

Relevancy Analysis

We first reviewed the SDG framework to determine which of the 169 SDG targets are relevant to US cities. For this analysis, we treated a target as relevant if progress is likely to be shaped, at least in part, by public policies, programs, and activities by municipal leaders in urban areas in the United States. That is, a target is relevant if municipal leaders and local governments could directly influence progress toward achieving the target in their city or region. Although we focus on public policies, programs, and activities within cities, we take an expansive view of what local governments can accomplish, including influencing the consumption patterns of residents or private business practices through incentives and regulations.[17]

Our definition leads to three general categories of targets that we identified as *not* relevant to US cities. First, where the target is explicitly limited to "developing" or "least developed" countries and therefore does not apply to the United States (e.g., target 17.5: Adopt and implement investment promotion regimes for least developed countries). Second, where the target is explicitly limited to laws, regulations or policies that are exclusively managed by higher levels of government, such as international trade and foreign aid in the Unites States (e.g., target 10.5: Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations). Third, where the target addresses sustainable development issues that typically occur outside of urban contexts, such as large-scale agricultural production, marine conservation, or wildlife management (e.g., target 15.7: Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products). In each of these categories, local civic and public leaders are unlikely to be able directly influence progress toward achieving the target in their city or region. We exclude the "not relevant" targets from our subsequent analysis to determine the measurability of SDG targets in US cities.

Measurability Analysis

For each relevant target, we searched for publicly available data sources that could measure the progress in large urban areas in the United States. We define a target as "measurable" if we identified at

least one publicly available data source that could be used to compare and track progress across the 100 largest cities or 100 largest metros in the US.[18] For this analysis, we broadly interpret the relevant SDG targets and identify data sources that could be converted to indicators for each. We do not attempt to construct indicators or suggest which indicators would be most appropriate to compare and track progress for each relevant target—a determination that we believe would require more deliberation and input from local leaders and key stakeholders (see note in appendix B on translating data to indicators).

We debated the appropriate geographic scale to use and whether to focus our analysis on the measurability of the SDG targets in cities or metropolitan areas, recognizing the advantages and disadvantages of each approach. For example, though municipal leaders often have the power to set policy on many areas of sustainable development, metropolitan areas better reflect interconnected housing and labor markets, and progress on sustainable development may spill across municipal boundaries. For city leaders trying to understand forces of change, knowing what is going on in the larger metro area is critical; however, aggregate measures of metro-level performance may obscure disparities between municipalities within the region. In the end, we decided to identify data sources that could be used to measure progress at *either* geographic scale, noting where limitations in the data would prevent aggregation (or disaggregation) to larger (or smaller) geographies.[19] We include a discussion on the challenges related to geographic coverage, aggregation of data, and city boundary changes in appendix B.

We limited our analysis to data available for the 100 largest cities or metros to include data collected by federal agencies or provided by private entities for a large sample of cities or metros, while excluding sources that are only available in for a small subset of cities or metropolitan areas.[20] We also investigated data that are commonly available from local sources (including local public agencies and data intermediaries) to get a sense of how, with additional effort, local sources could be used to fill gaps in data that are already collected and published across the 100 largest cities or metros.

For our measurability analysis, we first conducted extensive desk research to identify relevant data sources from US federal agencies, as well as datasets collected or published by private entities and research institutions that track various dimensions of sustainable development. We examined which of the national data used to report on the SDG indicators on OMB's National Reporting Platform could be disaggregated to the city or metro levels.[21] We also consulted several national databases that report data at the city, metro, or county levels, including PolicyLink's National Equity Atlas, Reinvestment Fund's PolicyMap, and the National Association of Counties' County Explorer, to determine which of the indicators they publish map onto the SDG framework.[22] To identify local data sources, we consulted

the *Catalog of Administrative Data Sources for Neighborhood Indicators* (Coulton 2008), as well as the data sources used by the University of Baltimore and SDSN to develop an SDG indicator system for the City of Baltimore (Iyer et al. 2016) and by researchers at Stanford University to develop an SDG dashboard for San Jose, California.[23] Finally, we consulted subject area experts at the Urban Institute to suggest additional sources we may have missed.

Once we found a data source that could be used to track progress on a relevant SDG target, we further investigated its geographic coverage (including smallest geography for which the data are available), the most recent year in which the data are available, and the frequency with which the data are updated. From this analysis, two categories of data sources emerged:

1. *National data that are uniformly available for the 100 largest cities or metropolitan areas.* Data sources in this category are typically those collected by the federal government and publicly reported by federal agencies, such as US Census American Community Survey (ACS) data (our most commonly used source). We coded these data as measurable if they are uniformly available for the cities or metropolitan areas directly or for smaller geographies that can be added up to fit city or metropolitan area boundaries. For example, data available for census tracts can always be aggregated to form city, county, and metro totals; data available for zip codes do not match city and county boundaries precisely, but they can often be aggregated to form reasonably close approximations; data available for counties can always be aggregated to the metropolitan area level but not the city level (see additional notes on aggregation and geographic boundaries in appendix B). We also include data available from private sources, such the Trust for Public Land's ParkScore index or the National Center for Charitable Statistics' Geographic Focus tool, if they are reported for—or could be aggregated to—the 100 largest cities or metropolitan areas.[24] These private data may be calculated from uniform public sources, produced from surveys, derived from review of local administrative records, or any combination of these methods.
2. *Local data that are often available at the local level but not uniformly collected and published across cities.* Local administrative records, such as those collected by school districts or local planning departments, typically occupy this category. In some cases, we include data collected by state agencies when they are frequently reported at the local level. We also include in this category data collected by private organizations and research institutions for a large sample of cities but are not reported for all 100 largest cities and metros.[25]

Because our measurability analysis is designed to calculate which targets could be readily compared and tracked across US cities or metros, we code a target as "measurable" if it includes at least

one national data source (the first category). All relevant targets are further classified as measurable for the 100 largest cities only or measurable for the 100 largest cities or metros to give a sense of the trade-offs between these scales.[26] We use local data sources (the second category) to discuss how local leaders could go beyond national data sources to fill gaps in data and track progress SDG within their own communities.

UN Indicators Analysis

Finally, we used our relevancy and measurability analyses to determine if city- or metro-level data are available to track progress on the official indicators the UN developed to measure global progress on the SDGs.[27] Recognizing that the UN designed these indicators to track and compare progress at the national level, we wanted to get a sense of how well they translate to cities and metros and whether data are currently available in the US to track city- or metro-level progress on them.

To make this assessment, we identified which of the 232 official SDG indicators the UN assigned to each of our relevant SDG targets, and we coded these indicators as relevant for US cities. (For this analysis, we do not separately assess the relevance of individual UN indicators; rather, we assume that if an indicator was assigned to a relevant target, it is also relevant to US cities). We then determined the measurable UN indicators using similar methods to those described above for the SDG targets—we code an indicator as measurable if we could identify at least one data source that could be used to track and compare progress across the largest 100 cities or metros. However, because the UN's SDG indicators are more narrowly defined than the SDG targets, we classify a relevant indicator as measurable only if the data source could be used to track that indicator as defined by the UN, including whatever population disaggregation or rate is specified in the indicator language.

Findings

Relevancy Analysis

We find that the SDGs are highly relevant to US cities and action local policymakers take in urban areas can go a long way towards achieving the goals (table 1). Specifically, we find that 103 of the 169 SDG targets (or 61 percent) are relevant to US cities.[28] Goals 3 (health), 4 (education), 5 (gender), 6 (water), 8 (economy), 9 (infrastructure), and 11 (cities) had the highest percentages of relevant targets. Conversely, the targets encompassing goals 2 (hunger), 14 (oceans), 15 (land), and 17 (partnerships) are generally less relevant to US cities.

TABLE 1

Relevancy of SDGs to US Cities

SDG goal	Total SDG targets	Number of targets relevant to US cities	Share of targets relevant to US cities
1 Poverty	7	5	71%
2 Hunger	8	2	25%
3 Health	13	10	77%
4 Education	10	9	89%
5 Gender	9	8	78%
6 Water	8	7	88%
7 Energy	5	3	60%
8 Economy	12	9	75%
9 Infrastructure	8	6	75%
10 Inequality	10	5	50%
11 Cities	10	9	90%
12 Consumption	11	8	73%
13 Climate	5	3	60%
14 Oceans	10	3	30%
15 Land	12	5	42%
16 Justice	12	8	67%
17 Partnership	19	3	16%
Total	**169**	**103**	**61%**

Note: Share of targets is shaded on a red-green spectrum with red being least relevant (0%) and green being most relevant (100%).

Our relevancy analysis simply presents the share of targets under each goal that local leaders in urban areas can directly influence. We do not quantify how relevant a goal would be using a different set of targets, nor do we attempt to align the topics each goal covers to current priorities among local leaders. This leads to results that may seem counterintuitive, such as a low share of targets under goal 2 (hunger) that we classify as relevant to US cities, even though requests for emergency food assistance are on the rise in many cities (USCM 2016). Though hunger and food security issues are of course salient across US cities, the targets under SDG goal 2 mostly relate to large-scale food production, which is uncommon in US cities. Having a low share of relevant targets under a goal does not indicate that the goal is less relevant to US cities or that targets under that goal do not reflect pressing issues that require urgent action by city leaders.

Measurability Analysis

A substantial share of the relevant SDG targets can be measured in US cities or metros using publicly available data sources. Of the 103 relevant targets, 68 (or 66 percent) are measurable across the 100 largest cities or metros (table 2). All the relevant targets under goals 2 (hunger), 3 (health), 8 (economy), and 9 (infrastructure) can be measured at the city or metro level, and goals 1 (poverty) and 10 (inequality) also have high rates of measurability. Less than half of the relevant targets under goals 6 (water), 12 (consumption), 13 (climate), and 16 (justice) are measurable, and none of the relevant targets under goal 14 (oceans) are measurable across US cities and metros.

If we limit our analysis to data that are only available at the city level, a much lower share of relevant targets (38 percent) are measurable. This is because several data sources are only reported at the county or metro levels, and it would be difficult or impossible to isolate reliable city-level values or trends from these sources. If we expand our filter to include both city- and metro-level data, we see significantly greater measurability rates across several SDG goals. This demonstrates the trade-offs in choosing the geographic scale for tracking SDGs in urban areas in the US, including that city-level data may be more useful for local decisionmakers but will limit the number of targets that can measured across places.

TABLE 2

Measurability of SDG in US Cities and Metros

SDG goal	Total targets relevant to US cities	Relevant targets measurable in 100 largest cities	Relevant targets measurable in 100 largest cities or metros	Share of relevant targets measurable in 100 largest cities or metros
1 Poverty	5	2	4	80%
2 Hunger	2	1	2	100%
3 Health	10	2	10	100%
4 Education	9	7	7	78%
5 Gender	8	5	5	63%
6 Water	7	1	3	43%
7 Energy	3	1	2	67%
8 Economy	9	4	9	100%
9 Infrastructure	6	3	6	100%
10 Inequality	5	3	4	80%
11 Cities	9	4	6	67%
12 Consumption	8	1	2	25%
13 Climate	3	1	1	33%
14 Oceans	3	0	0	0%
15 Land	5	2	3	60%
16 Justice	8	1	2	25%
17 Partnership	3	0	2	67%
Total	**103**	**39**	**68**	**66%**

Note: Share of targets is shaded on a red-green spectrum with red being least measurable (0%) and green being most measurable (100%).

Data Gap Analysis

By comparing the share of SDG targets relevant under each goal to the share of relevant targets that are measurable, we begin to get a sense of where significant data gaps exists for measuring progress on the SDGs in US cities. In the first two columns in table 3, we simply present the results of our relevancy and measurability analyses. We see that a high share of targets for goals 6 (water), 12 (consumption), 13 (climate), and 16 (justice) are relevant for US cities, but less than half of the relevant targets under these goals are measurable for the 100 largest cities or metros using national data sources. This suggests that these are goals in which stakeholders interested in monitoring urban progress on the SDGs in the US might focus new data collection efforts.[29]

TABLE 3

SDG Data Gaps for US Cities and Metros

SDG goal	Share of targets relevant to US cities	Share of relevant targets measurable in 100 largest cities or metros	Share of relevant targets measurable using both national and local data
1 Poverty	71%	80%	80%
2 Hunger	25%	100%	100%
3 Health	77%	100%	100%
4 Education	90%	78%	89%
5 Gender	89%	63%	88%
6 Water	88%	43%	43%
7 Energy	60%	67%	100%
8 Economy	75%	100%	100%
9 Infrastructure	75%	100%	100%
10 Inequality	50%	80%	80%
11 Cities	90%	67%	89%
12 Consumption	73%	25%	50%
13 Climate	60%	33%	67%
14 Oceans	30%	0%	33%
15 Land	42%	60%	80%
16 Justice	67%	25%	63%
17 Partnership	16%	67%	100%
Total	**61%**	**66%**	**81%**

Note: Shares of targets are shaded on a red-green spectrum, with red being least relevant or measurable (0%) and green being most relevant or measurable (100%).

In the third column of table 3, we include the share of targets that could be measured using both national data and data sources that are commonly available at the local level (identified through Coulton 2008; Iyer et al. 2016; and consultation with local-data experts at the Urban Institute). We estimate that 81 percent of relevant targets could be measured using a combination of data sources available nationally and locally. Here, we also see that local data could be used to fill significant gaps in nationally available data to measure progress on goals 7 (energy), 12 (consumption), 13 (climate), 15 (land), and 16 (justice). For many targets, we also identified local data sources that could supplement available national data sources to provide a fuller or more nuanced picture of local progress. In our SDG Data Inventory for US Cities, we include all data sources—national and local—that we identified for each target.

UN Indicator Measurability Analysis

Finally, we examine whether the official UN indicator system is useful for measuring progress on the SDGs in US cities. One hundred sixty-one of the UN's 232 indicators (or 69 percent) are assigned to targets that we classify as relevant to US cities (table 4). We find that only 31 (19 percent) of these 161 UN indicators are measurable across the 100 largest cities and metropolitan areas. Half of these indicators are concentrated in only two goals: 3 (health) and 8 (economy). For five of the goals, *none* of relevant UN indicators are measurable across US cities and metropolitan areas.

This result is disappointing but not surprising. Past research has found that most of the UN indicators are not sufficiently developed to be useable in most places, even at the national level (Worley 2016).[30] Many of those indicators face serious definitional and technical challenges, and it is unlikely that many countries will be able to monitor national progress using the official UN framework for some time to come. This implies the need to move ahead with viable adaptions where it is possible to do so quickly.

TABLE 4

Measurability of UN SDG Indicators in US Cities and Metros

SDG goal	UN indicators for relevant targets	Relevant UN indicators measurable in 100 largest cities or metros	Share of relevant UN indicators measurable in 100 largest cities or metros
1 Poverty	10	1	10%
2 Hunger	4	0	0%
3 Health	22	11	50%
4 Education	10	2	20%
5 Gender	10	2	20%
6 Water	10	1	10%
7 Energy	4	0	0%
8 Economy	14	6	43%
9 Infrastructure	10	1	10%
10 Inequality	6	1	17%
11 Cities	14	3	21%
12 Consumption	10	0	0%
13 Climate	6	0	0%
14 Oceans	3	0	0%
15 Land	6	1	17%
16 Justice	18	1	6%
17 Partnership	4	1	25%
Total	**161**	**31**	**19%**

Note: Share of targets is shaded on a red-green spectrum, with red being least measurable (0%) and green being most measurable (100%).

Implications and Recommendations

Our research suggests that the SDGs are highly relevant to US cities. We find that city leaders could directly influence progress toward achieving 61 percent of targets across the SDG framework. The SDGs are also highly measurable in US cities. We find that national data already exists to measure progress across the largest cities or metros in the US for 66 percent of relevant targets. This suggests that data limitations should not be the main barrier for city leaders who want to engage in the SDGs.[31]

However, we also find significant data gaps. These gaps are clustered in goals with a high share of relevant targets but for which only a small share of targets are measurable across US cities and metros: goals 6 (water), 12 (consumption), 13 (climate), and 16 (justice). Local administrative data can help fill gaps across several of these goals, suggesting that local governments can paint a fuller picture of progress across the SDGs by supplementing nationally available data with local sources.

Finally, we find that city leaders cannot rely on the official UN SDG indicator system for tracking local progress on the SDGs. Only 19 percent of the 161 relevant UN indicators across the SDG goals are measurable across US cities and metros using national data sources. And for five of the SDG goals, *none* of relevant UN indicators are measurable across US cities and metros using national data sources. This suggests that additional work is needed to create practical and relevant SDG indicators that city leaders can use to organize available data and guide local progress.

These findings lead us to four recommendations for how city leaders in the US could more effectively use data to hack the SDGs and how partners can support them in this process.

1. The US federal government and research partners should continue to develop, improve, and update national SDG data platforms to compare progress on SDG goals and targets across US cities and metros.
2. Civil society organizations and research partners should work with cities to develop a model local SDG indicator system to drive local decisionmaking and progress on SDG goals and targets.
3. Philanthropic organizations, national associations, and private-sector partners should support data-driven local SDG planning and implementation through capacity building, technical assistance, and data sharing.
4. US cities' leaders should engage with the UN and international community to share local progress on the SDGs.

Develop, Improve, and Update National SDG Data Platforms

Comparing progress across cities using consistent indicators and uniform data can support local decisionmaking and facilitate knowledge sharing among cities. It can help city leaders identify where their city excels or lags compared with their peers, which, in turn, can help them identify best practices and prioritize areas for investment and improvement. When combined with a ranking system, indicators of urban sustainability can reward cities' achievements and encourage healthy competition (Arcadis 2016). Ranking systems can also attract media attention, inspire action among private-sector partners and raise public awareness of what it means to be a sustainable city.[32]

SDSN has already collected and published data on several indicators for the SDGs and ranked performance across the SDG goals for the 100 largest metropolitan areas in its US Cities Sustainable Development Goals Index (Prakash et al. 2017). The SDSN index is a valuable tool to compare progress across US metros and should stimulate national and local awareness about the SDGs. However, the SDSN index differs somewhat from our recommended approach by collecting and indexing data on indicators that correspond to overarching SDG goals, not specific targets within each goal. Tracking progress at the goal level is extremely helpful, but, within goals, individual targets often relate to concepts that are quite different from each other. Tracking progress at the target level might provide more sensitive monitoring of the underlying currents of concern for each goal and provide a more nuanced guide to action. Indicators at the target level also may be more valuable for international comparisons. In future iterations of the index, SDSN should consider keying indicators to SDG targets when possible and provide unindexed values for individual target-level indicators for each city.

The OMB's National Reporting Platform is another valuable public tool to measure domestic progress on the SDGs. However, the NRP site only includes data to report national progress on the official UN SDG indicators. To date, it includes data on 79 of the 232 UN indicators, and it does not provide subnational data on any of these indicators. The US federal government could develop and release a subnational indicator system that tracks progress in US metros, counties, or cities. However, our research reveals that few of the official UN indicators are measurable in US cities or metros, so this would require some deliberation and public discussion about the right indicators to use to measure subnational progress at the target or goal levels—a process we hope our research can help inform.[33] In the near term, the OMB could provide a complete catalogue of national data sources in the NRP that can be disaggregated to various subnational geographies and point users to where they can find data on the reported indicators for their community.[34]

Develop a Model Local SDG Indicator System

The data sources we identified here could contribute to a model local SDG indicator system that would help local leaders design sustainable development strategies and track progress within their cities. A model local SDG indicator system could also help city leaders fill gaps where nationally available data are thin, such as on sustainable consumption, climate mitigation, land management, and access to justice.

At a global scale, researchers have found the development of a shared indicator system to measure progress on the SDGs in cities across countries challenging (Simon et al. 2016). This is because of data limitations at the local level (particularly in developing countries) and a tension between designing indicators that are "useful at the practical level of city politics and administration" and those that are "useful for the scientific goal of better characterization and understanding of the complexity of cities" (Klopp and Petretta 2017). Our research directly confronts the first challenge and suggests that locally generated data can be combined with disaggregated national data in the US to develop indicators for more than 80 percent of the SDG targets relevant to US cities. A model local SDG indicator system that is specific to US cities should resolve the second challenge in favor of indicators that are most useful to decisionmakers at the local level, where progress on the SDGs is urgently needed. It does not need to tackle the complexities of measuring progress across different country contexts; rather, it should be a local decisionmaking tool. It should be sufficiently broad and flexible that local leaders can customize it to meet local priorities while aligning local planning and data collection efforts with the SDG framework.

Baltimore's experience "localizing" the SDGs can help illustrate the value of a local SDG indicator system. In 2015, Baltimore was selected as one of three US cities to pilot implementation of the SDGs as part of a SDSN's USA Sustainable Cities Initiative.[35] As part of this pilot, the University of Baltimore and its Baltimore Neighborhood Indicators Alliance led a collaborative, multistakeholder process to establish locally relevant indicators for each of the 17 SDG goals that culminated in the report *Baltimore's Sustainable Future* (Iyer et al. 2016). This report includes 56 specific SDG indicators that track the SDG goals and targets but are grounded in Baltimore's needs and priorities. These indicators are designed to be integrated into the city's planning and budgeting processes going forward. According to the city's Mayor Catherine Pugh, who endorsed the initiative in a letter accompanying the report: "As we continue to engage community stakeholders and residents in collaborative problem solving, it is crucial to not only agree on common goals for our community, but to also publicly provide relevant data to measure our progress."[36] The Baltimore Sustainable Cities Initiative also used the SDG framework to

shine a spotlight on where local data collection and reporting were weak. For example, the SDG planning process led to agreement on a set of indicators to monitor access to justice for vulnerable populations under goal 16 (justice), an area that is notoriously "data poor."[37]

A model local SDG indicator system could draw from the indicators developed in Baltimore and other cities participating in SDSN's Sustainable Cities Initiative, as well as from existing indicator systems for sustainable development in cities in the US (such as the STAR Community Rating System and the US Partnership for Sustainable Communities' Sustainable Community Indicator Catalog) or globally (such as ISO 37120 Sustainable Development of Communities and UN-Habitat's City Prosperity Index).[38] The data inventory we developed can also be a resource. Many local institutions with data capacity, including regional planning agencies, university centers, and data intermediaries that are members of the National Neighborhood Indicators Partnership, can help identify additional local data sources and develop locally relevant indicators (Kingsley, Coulton, and Pettit 2014).[39] Eventually data collection efforts associated with local SDGs indicators might become standardized and contribute to the national SDG data platforms described above.

Support Data-Driven Local SDG Planning and Implementation

Though local data capacity in US cities is constantly growing, additional resources and support will be needed to collect and apply data on SDG-related issues. Efforts to localize the SDGs in US cities should be aligned with broader national initiatives to use data to improve city operations and public services, such as Bloomberg Philanthropies' What Works Cities, Johns Hopkins University's 21st Century Cities Initiative, or Harvard University's Civic Analytics Network.[40] These initiatives recognize that data can drive more efficient public management of cities but generally do not use an overarching framework to guide progress toward more sustainable outcomes. The SDGs can provide such a framework and help direct data-driven governance toward greater sustainability, inclusion, and participation at the local level (CODE 2017; Edwards, Greene, and Kingsley 2016).

Several global resources and tool kits already exist to help city leaders apply and implement the SDGs at the local level. For example, SDSN (2016) has published a guide for *Getting Started with the SDGs in Cities* and the Global Taskforce of Local and Regional Governments, UN Development Programme, and UN-Habitat have collected a set of tools to help local actors contribute to the SDGs on the Localizing the SDGs site (http://www.localizingthesdgs.org/). These materials offer general principles

and suggest best practices for raising awareness about the SDGs, engaging stakeholders and community leaders, collecting data, aligning the SDGs with local plans and priorities, and evaluating progress. However, they are not tailored for US cities and do not speak directly to policy priorities and institutional constraints of US city leaders or specify the data and other resources available to them. National associations of local public officials, such as the US Conference of Mayors, National League of Cities, or the International City/County Managers Association, could follow the example of similar associations in Brazil, Netherlands, and Belgium that have targeted guidance and specific tools for cities in their countries to incorporate the SDGs into municipal plans and management systems (Dienst internationaal VVSG, n.d; Joppert and Granemann 2016; UCLG 2017).[41]

Private-sector partners can also support local progress on the SDGs by sharing data that can help city leaders identify sustainability challenges, set priorities, and monitor impact. In our analysis, we do not attempt to identify privately held data that could be used to fill data gaps for relevant SDG targets; however, we expect that in certain areas, such as sustainable consumption and equitable access to technology, privately held data could support additional indicators and produce valuable new insights. In addition to filling gaps, privately held data can provide more timely and fine-grained tracking of local progress on the SDGs. When combined with public survey and administrative data, privately held data can also help local leaders get ahead of challenges related to sustainability and inclusion through modeling and predictive analytics (Greene and Pettit 2016). Existing data collaboratives that facilitate the responsible exchange of corporate data to create public value, such as those supported by GovLab, can use the SDGs to motivate and frame data sharing to address local sustainability challenges.[42]

The SDGs were designed in part to spark a "data revolution" in which private-sector data and new technologies are harnessed to solve the world's more pressing sustainable development challenges (IEAG 2014). The Global Partnership for Sustainable Development Data was created to cultivate partnerships with private data providers and support responsible sharing of data, and UN's Global Pulse was created to harness innovations in big data for public good, including to advance the SDGs.[43] However, both initiatives have focused on addressing data poverty in developing countries. Bringing the SDG data revolution home in the US could involve forging new partnerships between private data providers, city governments, and local data intermediaries to fill data gaps and build capacity to use data for local decisionmaking, even in a relatively data-rich environment (CODE 2017).

Engage with the UN and International Community to Share Local Progress

The successful campaign to include a dedicated SDG goal on cities helped catalyze an ongoing movement to strengthen the voice of local leaders in the SDGs monitoring process, led by global city networks, such as United Cities and Local Governments, the Global Taskforce of Local and Regional Governments, and ICLEI Local Governments for Sustainability. Each of these networks have adopted commitments to contribute to the SDGs through policy action at the local level and continue to press for greater representation of their members in the UN's SDG monitoring process.[44] Although these global city networks do not yet have a formal role in the annual High-Level Political Forum (HLPF) review, they are creating alternative mechanisms for their members to participate in SDG monitoring. These include supporting local governments to contribute to their country's voluntary national reports, conducting and publishing independent monitoring of progress towards localizing the SDGs within countries, hosting side events at the annual HLPF meetings, and promoting online campaigns that allow city leaders to share progress on the SDGs via social media or on dedicated knowledge-sharing platforms (UCLG 2017).[45]

The year ahead will provide a window of opportunity for city leaders to engage more directly in SDG reporting. In 2018, the HLPF will conduct an in-depth review of global progress on goal 11 (cities). Member nations will be expected to report specifically on steps and progress they are making on sustainable urban development and discuss how they plan to contribute to global progress on goal 11 by 2030. If the United States submits a voluntary national report on the SDGs in 2018, city leaders can use data and local planning efforts to contribute directly to that report. But if not, they can take advantage of the many other channels being created to allow cities across the globe to share progress on the SDGs and learn from each other. The relative abundance of data to measure progress on the SDGs locally in the US can provide a strong foundation for global engagement. US city leaders can showcase creative ways they are adapting the SDG framework and applying data to inform and measure progress in their communities, as well as benefit from learning about the experiences of their global counterparts in localizing the SDGs.

Conclusions

Ultimately, whether US cities apply the SDG framework to advance local progress on sustainable development will depend on whether they see utility in the SDG framework for local decisionmaking—city leaders have to *want* to hack the system. In this report, we do not attempt to motivate local engagement in the SDGs; rather we take for granted that momentum is already occurring and other efforts are under way to drum up support for the SDGs at local level, such as SDSN's engagement in pilot cities, Bread for the World's efforts to organize civil society groups, and the Council on Foundations' work connecting the SDGs to local funding priorities (Edwards and Ross 2016).[46]

However, demonstrating the relevancy of the SDGs for city leaders and assessing the availability of data to support monitoring of progress of the SDGs can help pave the way for more US cities to get involved in SDG planning and implementation. The SDG framework encompasses many of the challenges that US mayors increasingly identify as top priorities: poverty, income inequality, racial inclusion, public safety, transportation and infrastructure, renewable energy, and climate change (Einstein et al. 2017; USCM 2017). The SDGs provide a comprehensive framework to understand progress on each of these challenges and draw connections between them. They have the potential to help city leaders address sustainability challenges in a more integrated and coordinated manner.

Data can help. Using consistent data to track progress across US cities can foster healthy competition and peer learning. Developing local SDG indicators can stimulate robust community engagement and consensus building. The SDG framework can expose local data gaps and help recruit partners to help fill them. Using data to monitor progress on the SDGs can also help cities showcase progress on a global stage and source innovations from global counterparts. Initially, only a handful of US cities might embrace the SDG framework as a way to improve programs and policies, but telling their stories of using data to drive local action and support better outcomes could hasten progress on the goals and uptake amongst other cities. Over time, and with the right support in place, hacking the SDGs could give way to US cities leading on them.

Appendix A: Sustainable Development Goals

The 17 Sustainable Development Goals listed below were adopted by all 193 members of the United Nations at the UN Sustainable Development Summit on September 15, 2015. These goals are supported by 169 targets that are available online at www.un.org/sustainabledevelopment.

- Goal 1: End poverty in all its forms everywhere.
- Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- Goal 3: Ensure healthy lives and promote well-being for all at all ages.
- Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- Goal 5: Achieve gender equality and empower all women and girls.
- Goal 6: Ensure availability and sustainable management of water and sanitation for all.
- Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all.
- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
- Goal 10: Reduce inequality within and among countries.
- Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable.
- Goal 12: Ensure sustainable consumption and production patterns.
- Goal 13: Take urgent action to combat climate change and its impacts.
- Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

- Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
- Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

Appendix B: Data Limitations and Considerations

In our analysis, we adopted a broad definition of "measurability" for relevant SDG targets, identifying data that could be aggregated to the city or metro level and converted to indicators for each relevant SDG target. This was purposeful, meant to establish the overall applicability of the SDG framework for US cities and assess the extent to which the SDG goals and targets could be tracked in US cities and metros using data from readily available sources. Though we find that existing data sources cover a large share of relevant SDG targets at the city or metro level, we do not independently assess the quality of the data or the ease with which it can be collected, aggregated, or reported. In this appendix, we specify some of the limitations of the data sources used in our analysis.

In this report, we also recommend two complementary uses for the data sources we compile in our SDG Data Inventory for US Cities: (1) to help develop and refine national platforms to compare progress *across* US cities; and (2) to help develop of a model local indicator system to support SDG planning and implementation *within* cities. Converting data into useful indicators for either of these purposes will require deliberation over which indicators will function best as decisionmaking tools, careful selection of data to support these indicators, validation of the data, and aggregation to the relevant geography of interest. In this appendix, we identify a set of important considerations for using the sources in the data inventory for either these purposes.

Translation from Data to Indicators

In constructing SDG indicators for US cities, summary counts will need to be converted into rates to allow for comparisons across populations and places. However, in our analysis and data inventory, we do not attempt to consistently report normalized measures, in which absolute amounts are represented as a rate (e.g., share of the population or other relevant denominator), nor do we suggest combining data sources to create indices that might better measure progress on a target than a single indicator. In a few cases where a SDG target or UN indicator can *only* be measured by combining more than one data point (e.g., where the target or indicator specifies a normalized rate, such as per capita), we describe the data sources that could be combined to produce an indicator in the data notes in our inventory.

There are several considerations when transforming counts or measures into indicators. In some cases, identifying the appropriate denominators requires a careful assessment, particularly when combining different data sources. Second, users may want to perform additional steps to control for important regional variations (such as adjusting for local cost of living using the Bureau of Labor Statistic's Consumer Price Index). Finally, city actors may choose to combine national data with local data to produce unique indicators that provide a more nuanced understanding of local conditions (e.g., generating a measure of food deserts by combining federal data on income or vehicle ownership with local data on healthy food providers).

Frequency of Data Updates

To ensure that existing data can provide recent baseline measures on SDG progress, we only include in data sources for which there are data available in any year since 2010 (or, in one case, a 2009 dataset for which an update is imminent). However, to track progress over time on the SDGs, city leaders will need data that are updated with some frequency between now and 2030, when the SDGs expire. Across the data sources we identified, we found wide variety in how frequently they are updated. This suggests that monitoring progress on the SDGs in US cities—whatever forms it takes—will need to report data in the most recent year available rather than at consistent intervals across all sources.

Most of the data sources we identified are collected and published by federal agencies, such as the US Census Bureau's American Community Survey, Centers for Disease Control's National Health Interview Survey, and the Bureau of Economic Affair's Regional Economic Accounts. These data are usually updated at regular intervals, typically annually or every two or five years, depending on the source. However, even among federal data sources, the frequency of updates can vary depending on budget allocations, agency priorities, or collection methods. For example, we include measures from the Environmental Protection Agency's Envirofacts website that are updated at irregular intervals.[47] Additionally, changes in federal administrations between now and 2030 could lead to addition, removal, changes to frequency, or altered collection methods for data sources that are pertinent to achieving the SDG priorities.

Several data sources we identified were developed by private organizations or independent research institutions, such as UC Berkeley's CoolClimate Calculator or Brown University's American Communities Project. In many of these cases, the frequency with which the data will be updated—at least as currently calculated and presented—is uncertain.[48]

Rather than anticipate the likelihood of updates to either public or private data sources, we simply note in our data inventory the current frequency with which the data are updated and indicate where additional updates are "uncertain." We do so in recognition that the SDGs were designed in part to stimulate a data revolution in which all UN member states and private partners should invest in strengthening local data capacities and expanding the availability of subnational data on key sustainable development indicators (Edwards, Greene, and Kingsley 2016; Kingsley 2017). A sustained and effective movement to monitor subnational progress on the SDGs could have a catalytic effect, sparking commitments to improve data sources and creating constituencies to press for continued updates to essential data, whether produced by public or private entities.

Geographic Scale and Boundary Changes

As discussed in the methodology section, the data sources we list span several different geographic scales. Harmonizing across geographic scales can present a significant challenge for data comparability.

For survey data collected by the US Census Bureau, including the American Community Survey (the most common source in our inventory of SDG data), the Bureau publishes summary tables for most data at multiple geographies, including cities and metro areas.[49] Where data are only available at finer geographies, various techniques can be used to aggregate the data to the city or metro level. When point sources (such as addresses) are available, they must be matched to their respective city or metropolitan statistical area (MSA). Census tract data can easily be aggregated at either the city or MSA level. Zip codes may cross political boundaries (including county and municipal borders); however, zip code level data can be aggregated and approximated at the city or metro level using geographic information system techniques or interpolated boundaries from the US Census Bureau's Zip Code Tabulation Areas.[50] County data can easily be aggregated to the metro level since MSAs are composed of counties (or county equivalents); however it is challenging to aggregate or disaggregate county-level data to cities where the city and county boundaries are not contiguous. The Missouri Census Data Center publishes MABLE Geocorr, a geographic crosswalk tool that can be used to harmonize data across various geographies, including counties, places, zip codes, census tracts, block groups, and school districts.[51]

In addition to harmonizing across geographic scales, political and administrative boundaries often change, presenting challenges for measuring progress on SDG targets over time. Changes in census tracts can be reconciled over time using the Neighborhood Change Database, developed by the Urban

Institute and Geolytics, or the US Census Bureau's relationship files.[52] MSA boundaries may change over time as areas are reevaluated against the current criteria of population and commuting patterns or when the criteria are revised altogether. Online tools such as SAGE Stats and the US Census Bureau's historical delineation files can be used to track changes in MSA boundaries over time.[53]

Disaggregation by Demographic Characteristics

Ensuring that SDG commitments are translated into effective action requires a precise understanding of focus populations. In some cases, this is an important component of the SDG targets, such as when a target emphasizes the need to track progress for certain subpopulation or age group (e.g., target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round). Even when not incorporated in the target, disaggregation is important for ensuring the SDGs are achieved for all people rather than just a segment of the population—a key principle of the SDGs embodied in the pledge to "leave no one behind."[54]

Where we could, we included data variables in our inventory that could be disaggregated by race, gender, age, income, or other breakdowns. Unfortunately, disaggregation is not an option for many of our sources. Many data sources simply do not report race or other demographic characteristics. But even for data sources that include demographic data, such as the American Community Survey (ACS), estimates can become unreliable when reported for small geographies (such as neighborhoods) or for small subpopulations (such as those representing less than 10 percent of the total population). When using these data, it will be necessary to consider any associated confidence intervals or margins of error. The ACS publishes online resources and tools to help users determine when estimates are statistically significant.[55] However, when using estimates to assess progress for subpopulations on any SDG indicator, it may be helpful to work with a skilled data analyst or a data intermediary to ensure that the data can be reliably disaggregated (Hendey and Cohen 2017).

Local Data

To suggest how local data could be used to supplement national sources to fill gaps in measuring progress on the SDGs in US cities, we consulted several sources to identify administrative data that are commonly collected by state, county, or municipal agencies and reported at the city or neighborhood

level. As noted in the report, we consulted the *Catalog of Administrative Data Sources for Neighborhood Indicators* (Coulton 2008) and the local data identified by the University of Baltimore and the Sustainable Development Solutions Network (Iyer et al. 2016), as well as colleagues within the Urban Institute who coordinate the National Neighborhood Indicators Partnership, a collaboration among community data intermediaries in 32 cities.[56]

Though these sources can help suggest how local data could be used to track local progress on the SDGs, we did not conduct an exhaustive search nor did we define a clear threshold for "commonly available" local data. We expect that, with further investigation and consultation with local researchers, data intermediaries, and public agencies, additional local data sources could be identified to track local progress on the SDGs.

Notes

1. "Sustainable Development Goals," United Nations, accessed July 25, 2017, https://sustainabledevelopment.un.org/sdgs/.
2. "High-Level Political Forum 2017," United Nations, accessed July 25, 2017, https://sustainabledevelopment.un.rg/hlpf.
3. "Goal 11: Make cities inclusive, safe, resilient and sustainable," United Nations, accessed July 25, 2017, http://www.un.org/sustainabledevelopment/cities/; For more information, see the Campaign for an Urban Sustainable Development Goal website, http://urbansdg.org/.
4. Elena Kosolapova, "Mayors of Major Cities Commit to Implement Paris Agreement, SDG 11," *IISD's SDG Knowledge Hub*, June 27, 2017, http://sdg.iisd.org/news/mayors-of-major-cities-commit-to-implement-paris-agreement-sdg-11/http://sdg.iisd.org/news/mayors-of-major-cities-commit-to-implement-paris-agrl eement-sdg-11/; Simone d'Antonio, "Pope Francis, mayors pledge action on climate change and the urban SDG," *Citiscope*, July 23, 2015, http://citiscope.org/habitatIII/news/2015/07/pope-francis-mayors-pledge-action-climate-change-and-urban-sdg/; Gregory Scruggs, "In New York, global mayors gather to commit to the SDGs," *Citiscope*, September 25, 2015, http://citiscope.org/habitatIII/news/2015/09/new-york-global-mayors-gather-commit-sdgs/.
5. Maria Clara Valencia, "Post-conflict Columbia looks to its cities," *Citiscope*, December 6, 2016, http://citiscope.org/habitatIII/news/2016/12/post-conflict-colombia-looks-its-cities/; UCLG, "INSIGHT: German municipalities begin to localize the SDGs," *UCLG* (News), February 13, 2017, https://www.uclg.org/en/media/news/insight-german-municipalities-begin-localize-sdgs/; Lindiwe Dhlamini, "Integrating agenda 2030 for Sustainable Development Goals (SDGs) into regional and national development plans and strategies," *UNDP in South Africa*, January 20, 2017, http://www.za.undp.org/content/south_africa/en/home/presscenter/articles/2017/01/20/integrating-agenda-2030-for-sustainable-development-goals-sdgs-into-regional-and-national-development-plans-and-strategies-by-lindiwe-dhlamini.html/.
6. For more information, see "USA Sustainable Cities Initiative (USA-SCI)" Sustainable Development Solutions Network, accessed August 16, 2017, http://unsdsn.org/what-we-do/solution-initiatives/usa-sustainable-cities-initiative-usa-sci/.
7. For more information see the Localizing the SDGs website, http://localizingthesdgs.org/; "Cities and the Sustainable Development Goals," Urban SDG Knowledge Platform, accessed July 25, 2017, http://www.urbansdgplatform.org/service/intro/intro_urban/html.do/.
8. Ana Maria Lebada, "UN Statistical Commission Recommends SDG Indicator Framework for ECOSOC Adoption," IISD's SDG Knowledge Hub, March 14, 2017, http://sdg.iisd.org/news/un-statistical-commission-recommends-sdg-indicator-framework-for-ecosoc-adoption/.
9. Brendon Bosworth, "Explainer: The challenges of measuring cities' progress on the Sustainable Development Goals," *Cityscope*, March 7 2017, http://citiscope.org/story/2017/explainer-challenges-measuring-cities-progress-sustainable-development-goals/; "UN Statistical Commission agrees on global indicator framework," *Sustainable Development Goals* (blog), United Nations, March 11, 2016, http://www.un.org/sustainabledevelopment/blog/2016/03/un-statistical-commission-endorses-global-indicator-framework/.
10. UCLG World Secretariat and Its Capacity Building Working Group, "Where is the local voice in the SDGs review process?," *Cityscope*, July 10, 2017, http://citiscope.org/commentary/2017/07/where-local-voice-sdgs-review-process/.

11. We use the term "hacking" in its contemporary and most colloquial sense as a fix or a workaround to a problem that requires "an appropriate application of ingenuity" (see "The Meaning of 'Hack,'" *Appendix A. Hacker Folklore*, accessed August 16, 2017, http://www.catb.org/jargon/html/meaning-of-hack.html). Recognizing that the complexity of the sustainable development challenges embodied in the SDG framework will demand new ideas and new ways of thinking, several "hackathons" have been held in cities around the world to design innovative policy solutions to advance the SDGs. See, for example, Josh Slusher, "Hackathon Showcases Innovative Policy Solutions to Advance the Sustainable Development Goals," *Global Connections* (blog), UN Foundation, March 15, 2017, http://unfoundationblog.org/hackathon-showcases-innovative-policy-solutions-to-advance-the-sustainable-development-goals/; Joseph Gaylord, "Hacking the SDGs: #Connect2Effect Hackathon for sustainable consumption and production," *ITUblog*, International Telecommunication Union, March 20, 2017, https://itu4u.wordpress.com/2017/03/20/hacking-the-sdgs-connect2effect-hackathon-for-sustainable-consumption-and-production/.

12. Brendon Bosworth, "Explainer: The challenges of measuring cities' progress on the Sustainable Development Goals," *Cityscope*, March 7 2017, http://citiscope.org/story/2017/explainer-challenges-measuring-cities-progress-sustainable-development-goals/.

13. David Simon, "Cities respond: Testing the urban SDG indicators," *Cityscope*, October 2, 2015, http://citiscope.org/habitatIII/commentary/2015/10/cities-respond-testing-urban-sdg-indicators/; Dana Boyer, Stefanie Brodie, Joshua Sperling, Eleanor Stokes, and Alisa Zomer. "Implementing the Urban Sustainable Development Goal in Atlanta and Delhi," *UGEC Viewpoints*, June 18, 2015, https://ugecviewpoints.wordpress.com/2015/06/18/implementing-the-urban-sustainable-development-goal-in-atlanta-and-delhi/.

14. "UN National Statistics for the UN Sustainable Development Goals," US Office of Management and Budget., accessed July 25, 2017, https://sdg.data.gov/.

15. Solomon Greene and Brady Meixell, "Hacking the Sustainable Development Goals: SDG Data Inventory for US Cities," Urban Institute, September 2017, http://www.urban.org/research/publication/hacking-sustainable-development-goals.

16. For brevity, we describe each SDG goal with a single word throughout this report. For example, we abbreviate "Goal 6: Ensure availability and sustainable management of water and sanitation for all" as simply "goal 6 (water)." A full list of the SDG goals is included in appendix B.

17. In the United States, the power of local governments to set policy in particular areas is generally determined by state laws, and local governments' structure and autonomy varies widely from state to state (Schragger 2016). In making our relevancy determination, we did not analyze state laws that may limit local government's legal authority to act in any of the major SDG policy areas—either because of strict adherence to the "Dillon's Rule" principle or to statutes expressly preempting local action. Though such an analysis could prove valuable to understanding the ability of US cities to lead on SDG implementation, it was outside the scope of this research. For our purposes, we deem a target as "relevant" if a local government could plausibly influence progress through policy changes, modifying existing programs, reallocating resources, or launching public awareness campaigns.

18. We define a "city" as an incorporated Census place with a population of 50,000 people or more, a definition that combines the US Census Bureau's definition of an "urbanized area" (a continuously built-up area with a population of 50,000 or more) and its definition of an "incorporated place" (a self-governing political unit contained within as single state); see "2010 Census Urban and Rural Classification and Urban Area Criteria," US Census Bureau, last modified February 9, 2015, https://www.census.gov/geo/reference/ua/urban-rural-2010.html). We define a "metropolitan area" as a metropolitan statistical area (MSA), as defined by the US Office of Management and Budget (OMB). MSAs include a central county or counties containing an urban core of 50,000 people or more, plus adjacent outlying counties having a high degree of social and economic integration as measured through commuting. See "Metropolitan and Micropolitan," US Census Bureau, accessed August 16, 2017, https://www.census.gov/programs-surveys/metro-micro.html.

19. Among the 100 largest cities, 92 are located within the 100 largest metro areas. Data for the top 100 metropolitan areas still allows leaders to gain a reasonably good picture of conditions and trends for the country. In 2015, the largest 100 metropolitan areas accounted for 66 percent of the nation's population and 75 percent of its GDP.

20. One example is the American Housing Survey, which has sampled between 44 and 60 metropolitan areas at various intervals since 1974 (Bucholtz 2015). As with the American Housing Survey, budget allocations for the agencies collecting the data may determine the sample size and number of places included in any given year. For our analysis, we include data if the most recent year's sample included at least the 100 largest cities or metros. We excluded some valuable data sources that cover smaller numbers of urban areas from our measurability analysis in this report; however, we include these data sources in our online inventory.

21. "UN National Statistics for the UN Sustainable Development Goals," US Office of Management and Budget, accessed July 25, 2017, https://sdg.data.gov/.

22. For more information, see National Equity Atlas website, http://nationalequityatlas.org/indicators/; See also Policy Map website, https://www.policymap.com/; "NACo County Explorer," National Association of Counties, https://cic.naco.org/.

23. "SDG Dashboard for San Jose," Stanford University, accessed July 25, 2017, http://sdg-stanford.opendata.arcgis.com/.

24. "Park Score 2017," The Trust for Public Land, accessed July 25, 2017, http://parkscore.tpl.org/.

25. For example, the US City Open Data Census collects information on local open data policies for 127 cities. However, because these data are self-reported, it does not include information on all of the 100 largest cities and we treat this a "local" data source. See "US City Open Data Census," accessed July 25, 2017, http://us-city.census.okfn.org/.

26. Not all data that are available at the city level can also be aggregated to the metro level, since MSAs may—and often do—include unincorporated places within counties.

27. We use the most recent version of the global SGD indicator framework, developed by the Inter-Agency and Expert Group on Sustainable Development Goal Indicators and agreed upon by the Statistical Commission, "Revised list of global Sustainable Development Goal indicators," March 2017, https://unstats.un.org/sdgs/indicators/indicators-list/.

28. We compared our relevancy determinations with a prior study conducted by the United Cities and Local Governments, which determined that 90 of the SDG targets are relevant to local governments (UCLG 2015). Though many of our relevancy determinations matched UCLG's, we identified a greater number of relevant targets that were distributed differently across the goals. Many of the discrepancies between our relevancy analysis and UCLG's are driven by two differences in our approach. First, UCLG focuses on local governments, not cities, so includes targets relevant to local governments in rural areas. Second, UCLG did not limit its analysis to local governments in the US cities or other advanced economies, so it also included targets that were relevant only to municipalities and other local governments in developing countries.

29. In their analysis of the 100 largest MSAs, SDSN found data gaps for goals 5 (gender), 7 (energy), 13 (climate), and 17 (partnerships), (Prakash et al. 2017).

30. Only 42 percent of the indicators have been classified as Tier 1 (established methodology and regularly accessible data). The rest are not useable now: Tier II (methodology established but data not easily available) and Tier III (internationally agreed-on methodology not yet developed—some of these are still not defined clearly enough to be measurable). Many of the Tier II and III indicators would be very expensive to implement. Further, one analysis suggests that another 23 percent of the 42 percent prove difficult to access and use now for several reasons. That implies that only 33 percent (just one third of the 232) are actually easily useable at this point even at the national level. Casey Dunning and Jared Kalow, "SDG Indicators: Serious Gaps Abound in

Data Availability," *Center for Global Development* (blog), May 17, 2016, https://www.cgdev.org/blog/sdg-indicators-serious-gaps-abound-data-availability.

31. Our findings should not be interpreted as suggesting that data limitations for tracking local progress on the SDGs are not significant in other countries, even in other developed or high-income countries. The data available to measure relevant SDG targets in cities will vary widely across countries, as will the political will to expand subnational data collection and access (see for example, Klopp and Petretta 2017; Simon et al. 2016).
32. Alberto Lucas López, Daniela Santamarina, and Kelsey Nowakowski, "The World's Top Cities for People and the Planet," *National Geographic*, accessed July 25, 2017, http://www.nationalgeographic.com/environment/urban-expeditions/green-buildings/sustainable-cities-graphic-urban-expeditions/.
33. The US federal government could also draw from subnational SDG indicator systems already developed or under way in Colombia, Kenya, and other countries that have submitted voluntary national reviews, described in UCLG's report *National and Sub-National Governments on the Way Towards the Localization of the SDGs* (UCLG 2017).
34. Under some of the national indicators, the OMB includes the lowest geographic level to which the data can be disaggregated, but for many indicators this information is incomplete.
35. For more information, see the "USA Sustainable Cities Initiative (USA-SCI)," SDSN, accessed August 16, 2017, http://unsdsn.org/what-we-do/solution-initiatives/usa-sustainable-cities-initiative-usa-sci/.
36. Carey L. Biron, "How Baltimore is using the Sustainable Development Goals to make a more just city," *Citiscope*, March 9, 2017, http://citiscope.org/story/2017/how-baltimore-using-sustainable-development-goals-make-more-just-city/.
37. Carey L. Biron, "How Baltimore is using the Sustainable Development Goals to make a more just city."
38. For more information see STAR Communities website, http://www.starcommunities.org/; "Sustainable Community Indicator Catalog," The Partnership for Sustainable Communities, https://www.sustainablecommunities.gov/indicators/; For more information see the International Organization for Standardization website. See also the "City Prosperity Initiative," UN Habitat, accessed August 16, 2017, https://unhabitat.org/urban-initiatives/initiatives-programmes/city-prosperity-initiative/.
39. Matt Lawyue and Kathryn L.S. Pettit, "Your City Needs a Local Data Intermediary Now," *Next City*, May 31, 2016, https://nextcity.org/daily/entry/national-neighborhood-indicators-partnership-local-data-intermediary/.
40. For more information, see the What Works Cities website, https://whatworkscities.bloomberg.org/; the 21st Century Cities Initiative website, http://www.21cc.jhu.edu/; and the Civic Analytics Network's website, http://datasmart.ash.harvard.edu/civic-analytics-network/.
41. For more information see "Gemeenten4GlobalGoals" Association of Netherlands Municipalities, accessed August 16, 2017, https://vng.nl/global-goals-gemeenten/.
42. For more information see GovLab's Data Collaboratives website, http://datacollaboratives.org/.
43. For more information see Global Partnership for Sustainable Development Data website, http://www.data4sdgs.org/; and United Nations Global Pulse website, http://www.unglobalpulse.org/.
44. "The Bogotá Commitment and Action Agenda," UCLG, October 15, 2016, https://www.bogota2016.uclg.org/sites/default/files/bogota_commitment.pdf; Elena Kosolapova, "Mayors of Major Cities Commit to Implement Paris Agreement, SDG 11," *IISD's SDG Knowledge Hub*, June 27, 2017, http://sdg.iisd.org/news/mayors-of-major-cities-commit-to-implement-paris-agrl eement-sdg-11/.

45. UCLG World Secretariat and Its Capacity Building Working Group, "Where is the local voice in the SDGs review process?," *Cityscope*, July 10, 2017, http://citiscope.org/commentary/2017/07/where-local-voice-sdgs-review-process/; For more information see Local 2030 website, https://www.local2030.org/.
46. Cynthia Woodside, "U.S. groups champion the 2030 Agenda," *Bread for the World* (blog), April 12, 2017, http://www.bread.org/blog/us-groups-champion-2030-agenda/.
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53. For more information see the SAGE stats webpage, http://data.sagepub.com/sagestats/index.php/; For more information see "Metropolitan and Micropolitan Delineation Files," US Census Bureau, last modified September 8, 2016, https://www.census.gov/programs-surveys/metro-micro/about/delineation-files.html/.
54. "Leaving no one behind," United Nations Department of Economic and Social Affairs Statistic Division, 2016, https://unstats.un.org/sdgs/report/2016/leaving-no-one-behind/.
55. For more information see the "Statistical Testing Tool," American Community Survey (ACS), US Census Bureau, last modified February 15, 2017, https://www.census.gov/programs-surveys/acs/guidance/statistical-testing-tool.html/.
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