# Social Progress Index: US States Methodology Summary





#### I. Introduction

The Social Progress Index: US States is a holistic, objective, transparent, outcomebased measure of quality of life that is independent of economic indicators. Its underlying framework is based on Social Progress Imperative's global work for over five years; it has been tested across and within countries and has been refined to strongly convey social progress concepts through aggregated data.

The Social Progress Index: US States compares the fifty states<sup>1</sup> on different facets of social progress, allowing the identification of specific areas of strength or weakness at the state level. It also allows states to benchmark themselves against other states both at the level of individual indicators as well as in terms of more aggregate measures of social progress. States are compared at an absolute level, with scores ranked in order of highest social progress to lowest, as well as at a relative level, with performance compared between states of similar economic stature.

The brief describes the methodology used to calculate the Social Progress Index: US States, detailing its design principles, indicator evaluation, and calculation. We also explain the methodology for calculating the states' Progress Report results.

### II. Design Principles

The Social Progress Index Framework is composed of 12 components, three dimensions, and an aggregate Social Progress Index score. Each component reflects one aspect of social progress, as reflected by three to six indicators used to calculate the component score. The indicators respond to the underlying conceptual questions posed by each component, shown in Figure 1.

Each dimension is a composite score of four related components, whose concepts intertwine to fall into the category of Basic Human Needs, Foundations of Wellbeing, or Opportunity. The dimensions seek to answer three distinct questions, respectively:

- 1. Does a state provide for its people's most essential needs?
- 2. Are the building blocks in place for individuals and communities to enhance and sustain wellbeing?
- 3. Is there opportunity for all individuals to reach their full potential?

Together, the three dimensions and their twelve underlying components comprise the overall Social Progress Index score.

<sup>&</sup>lt;sup>1</sup> We also calculated a Social Progress Index score for the District of Columbia. However, because of its unique political, social, and economic circumstances, and to avoid skewing our findings, we have opted to exclude it from our comparative analyses.



#### Figure 1: Social Progress Index Conceptual Framework

Basic Human Needs	Foundations of Wellbeing	Opportunity
Nutrition & Basic Medical Care	Access to Basic Knowledge	Personal Rights
Do people have enough food to eat and are they receiving basic medical care?	Do people have access to an educational foundation?	Are people's rights as individuals protected?
Water & Sanitation	Access to Information & Communications	Personal Freedom & Choice
Can people drink water and keep themselves clean without getting sick?	Can people freely access ideas and information from anywhere in the world?	Are people free to make their own life choices?
Shelter	Health & Wellness	Inclusiveness
Do people have adequate housing with basic utilities?	Do people live long and healthy lives?	Is no one excluded from the opportunity to be a contributing member of society?
Personal Safety	Environmental Quality	Access to Advanced Education
Do people feel safe?	Is this society using its resources so they will be available to future generations?	Do people have the opportunity to access the world's most advanced knowledge?

Unique among aggregate measures of progress in the United States, the Social Progress Index excludes economic indicators and is solely focused on outcomes. By excluding economic indicators from the design of the index itself, we can compare social outcomes in health, education, and rights, for example, to economic inputs such as median household income and state Gross Domestic Product without confounding their unique concepts. This allows for a stronger understanding of the relationship between use of financial resources and outcomes that affect people's lives.

Relatedly, the index's exclusive focus on outcomes ensures it captures how well a state meets the needs of individuals and helps them achieve certain capabilities, rather than using inputs to infer outcomes that they may or may not have led to. Input-based indexes require a degree of consensus about which inputs lead to which outcomes and how – a field of research that is still growing and to which the Social Progress Index hopes to contribute.

#### III. Indicator Evaluation

Under each component, we selected three to six indicators to respond to the corresponding conceptual question posed in Figure 1 above. A set of selection criteria that we uniformly apply across all Social Progress Indexes drove indicator selection, as did input from external experts on US data and socioeconomic research. The final set of indicators are shown below in Figure 2.



#### Figure 2: The Indicators of the Social Progress Index: US States Framework

**Basic Human Needs** Opportunity Access to Basic Knowledge Nutrition & Basic Medical Care Personal Rights Preschool enrollment Food insecurity Women in state legislature Maternal mortality High school incompletion Voter turnout Infant mortality Math proficiency Robust election process Youth preventative medical Reading proficiency Corruption Youth preventative dental Financial literacy **Personal Freedom & Choice** Water & Sanitation Access to Information & Communications Clean and safe water Urban access to broadband Early marriage Drinking water violations Water fluoridation Teenage birth rate Rural access to broadband Quality of public transportation Income parity in broadband Like what I do every day Home computer with fixed broadband Shelter Health & Wellness Inclusiveness Housing problems Adult obesity rate Gender pay gap Availability of affordable housing Prevalence of overweight youth Employment discrimination Homelessness Life expectancy Acceptance of legal immigration Unsheltered homeless Cost burden of treatment Support of same-sex marriage Access to disability support services Suicide rate Drug overdose deaths Hate group concentration Personal Safety **Environmental Quality** Access to Advanced Education Percent with 2- or 4-year college degree Violent crime rate Carbon dioxide emissions Percent with an advanced degree Murder rate Air pollution College retention rate Property crime rate Traffic deaths Pesticide exposure Renewable energy consumption Perceived safety

We selected indicators using the following criteria: an indicator must be focused on a social or environmental – rather than economic – outcome; it must come from a reliable source that validates data such as agencies of the US government, the US Census, or well-established think tanks; it must be reasonably current (published in 2013 or later); and it must cover most, if not all, of the 50 states and District of Columbia. These criteria guided our initial research across publicly disseminated data sources at the state level.

During the indicator selection process, we also consulted with several experts in social science research and across the topic areas of the twelve components. In addition to individual meetings, we held a consultation meeting in September 2017 in Washington, DC that featured representatives from Conference Board, Institute for Women's Policy Research, AARP, City University of New York, Deloitte's Center for Government Insights, and Brookings Institution, among others. We incorporated feedback from this session and other meetings into the final indicator evaluation process.

In all, we evaluated nearly 100 indicators and selected 53 to be included in the final index. Almost all 53 final indicators have complete data on the 50 states and the District of Columbia. A list of the final indicators selected, their definitions, and sources are included in Appendix A.

Prior to calculation, we imputed missing values and adjusted data skewness that might lead to biased results. We encountered missing data points in four indicators: corruption, rural access to broadband, women in state legislature, and college retention rate. Corruption, published by Harvard University Center for Ethics, was missing data on Louisiana and District of Columbia. We imputed these data prior to calculation by regressing corruption on the three other indicators within the Personal Rights component: women in state legislature, voter turnout, and robust election process.



District of Columbia was also missing data on rural access to broadband, women in state legislature, and college retention rate. We used the median value across all states to impute a value for rural access to broadband in DC, ensuring the District gains no advantage in performance due to its urban status. For women in state legislature, we used the proportion of women serving on the DC council as of December 2017. Lastly, for college retention, we used data from College Insight as a proxy, calculating the average retention rate across DC higher education institutions.

In assessing the indicators included in the final Index, we strove to ensure we corrected for data skewness that may bias results. We did this in two ways: categorizing the data into an ordinal scale and capping results at a point that avoids extreme outliers. Transforming the data into an ordinal scale ensures a more normal distribution of values, while capping ensures that no extreme values overly influence the calculated scores.

We transformed the values on only one indicator into an ordinal scale, drinking water violations (the percent of public water systems with health-based violations), ranging from 0 (high percentage of facilities with violations) to 6 (low percentage of facilities with violations). In doing so, we ensured that a state is not penalized for one violation more than another state due to the mere fact that it has fewer public water systems overall.

We capped the values of nine indicators: water fluoridation, homelessness, violent crime rate, murder rate, property crime rate, carbon dioxide emissions, quality of public transportation, employment discrimination, and hate group discrimination.

*Water fluoridation:* We recognized that water fluoridation is a contentious issue across the United States. While water fluoridation is recommended by the Center for Disease Control (CDC) and advocated by the American Dental Association, it is not required by law. As such, we capped values of this indicator at 79.6%, in line with the CDC's *Healthy People 2020* objective. States that surpassed this value (e.g., 100% of water fluoridated) therefore are treated the same as states that did not achieve or pursue 100% water fluoridation but met the CDC's objective.

Homelessness, violent crime rate, murder rate, property crime rate, quality of transportation, employment discrimination, and hate group discrimination: DC's values for these indicators exceeded the fifty states' values by a significant amount. While we excluded DC from the final 50-state rankings, we included DC in the index calculation and ensured through this capping method that its values did not skew results in a way that allows other states to receive significantly higher scores merely because of DC's poor performance.

**Carbon dioxide emissions**: Wyoming and North Dakota far exceeded all other states in emissions across all years of available data. We therefore capped the data at the highest value from the past 8 years (since 2010), excluding those historical values of Wyoming and North Dakota.



Indicators with capped values are listed below in Figure 3. These capped values also align with the best- or worst-case scenarios described in the next section about calculation.

Indicator	Highest (capped) value
Water fluoridation	79.60
Homelessness	0.56
Violent crime rate	800.00
Murder rate	12.00
Property crime rate	3,940.00
Carbon dioxide emissions	54.20
Quality of public	
transportation	6.00
Employment discrimination	80.46
Hate group concentration	1.00

Figure 3: Indicators with Capped Values

As a final step prior to calculation, we ensured that the indicators selected were correlated with one another within each component and tested their internal consistency as a group using Cronbach's alpha. Cronbach's alpha is a good preliminary screen for conceptual fit. An applied practitioner's rule of thumb is that the alpha value should be above 0.7 for any valid grouping of variables. Figure 4 below lists Cronbach's alpha for each component.

Figure 4: Cronbach's Alpha by Component

	Cronbach's
Component	Alpha
Nutrition and Basic Medical Care	0.80
Water and Sanitation	0.54
Shelter	0.85
Personal Safety	0.84
Access to Basic Knowledge	0.84
Access to Information and	
Communications	0.83
Health and Wellness	0.84
Environmental Quality	0.54
Personal Rights	0.80
Personal Freedom and Choice	0.69
Inclusiveness	0.81
Access to Advanced Education	0.85



Cronbach's alpha for indicators within Water and Sanitation and Environmental Quality did not meet the expected threshold of 0.7. We recognize these two components as particularly challenging, due to a lack of data in both subject areas across all states. The indicators included in those two components, as in the other ten, are the best available and are valid indicators conceptually linked to their respective components.

#### **IV.** Index Calculation

We calculated component scores from the indicator data using Principal Component Analysis (PCA). The PCA process extracts a common factor, or component, from the set of correlated indicators that we evaluated in the processes mentioned in the prior section.

To execute PCA, we first standardized the indicators using z-scores that have a mean of zero and standard deviation of one. This process ensures the indicators are comparable in scale when aggregated to a component. In this process, we included best- and worst-case values for each indicator to ensure that state performance is benchmarked against achievable goals, rather than solely relying on one state's current best or worst achievement. We relied on theoretical and historical performance data to set the standard for what is considered the best and worst possible performance on any given indicator. These boundary values are included in Appendix B.

PCA helps to account for overlap in measurement and concept between indicators, retaining the core component of the data to which each indicator uniquely contributes. Through PCA, we assigned a weight to each indicator. (Indicator weights are noted in Appendix B.) A state's component performance ('Component<sub>c</sub>') was therefore based on the sum of the weight of each indicator multiplied by the respective indicator value.

$$Component_{c} = \sum_{i} (w_{i} * indicator_{i})$$

The component value ('X') was then transformed to a scale of 0 to 100 using the formula below, with 'Best Case' assigned a score of 0 and 'Worst Case' assigned a score of 100.

$$Component_c \ score \ = \ \frac{(X_j - Worst \ Case)}{(Best \ Case - Worst \ Case)} \ X \ 100$$

We used geometric mean to aggregate the four components within each dimension into a dimension score. In contrast with arithmetic mean (or a simple average), geometric mean accounts for variation in performance across the four components that make up each dimension. For example, a state that performs very well on one of the four components but poorly on the other three will not receive the same score as a state whose arithmetic average is the same but performed at a consistent level across all four components. This method of aggregation is particularly relevant to the Social Progress



Index: US States, where the number of geographic entities compared is relatively small and we must distinguish each state's performance in a fair and balanced way.

The geometric mean is the fourth root of the product of the four components. As such, the formula used to aggregate component scores to dimension scores is as follows:

$$Dimension_d \ score = \sqrt[4]{(\prod_{c=1}^{r} Component_c \ score)}$$

Similarly, we aggregated the four dimensions into a Social Progress Index score using geometric mean. In this case, the geometric mean is the cube root of the product of the three dimensions. The calculation formula follows:

Social Progress Index = 
$$\sqrt[3]{(\prod_{d=1}^{3} Dimension_d \ score)}$$

For descriptive statistics across component, dimension, and Social Progress Index scores, see Appendix C at the end of this brief.

#### V. Progress Report Calculation

The states' Progress Reports benchmark each state's performance on indicators, components, dimensions, and the Social Progress Index relative to 15 states with similar household median income. Essentially, they pinpoint areas of underperformance, overperformance, and neutral performance while accounting for similar economic input. By highlighting areas of strength and weakness across social progress in this manner, we hope decision-makers in each state will learn from other states' experiences and share best practices in improving social progress beyond merely increasing income or other economic inputs.

We used median household income, rather than state GDP, because it is more commonly used in economic discourse in the United States and has a stronger relationship with social outcomes. We defined a comparator group for each state by selecting the fifteen states with the closest values of median household income. We excluded District of Columbia from these pairings, as its results and social context are unique in this exercise and would skew states' performance benchmarks.

For each state and each measure (indicator, component, dimension, and overall score), we determined the median performance on each measure within the comparator group. We used the median rather than the mean to minimize the influence of outliers. We then compared each state's performance to the median performance of states within its comparator group. If a state's score was greater than (or less than) the average absolute deviation from the median of the comparator group, we consider the state as an overperformer (or underperformer) on that measure. Scores that were within one average absolute deviation are within the range of expected scores and we considered such performance neutral – neither over- nor underperforming.



Lastly, we established a floor such that thresholds (i.e., median, upper/lower boundaries) are no less than those for states with lower median household income. Additionally, the minimum distance from median to overperformance or median to underperformance must be at least one point to be considered overperformance or underperformance.

#### VI. Conclusion

The Social Progress Index: US States is a new tool for policymakers and other decisionmakers across the 50 states and DC to understand the building blocks of social progress and to compare their performance on social outcome measures with other states, particularly those of similar economic means. Its underlying methodology has been tested and applied globally since 2013 and across several countries and regions, including Paraguay, India, and the European Union.

The US data landscape was a unique entry point for this exercise. While a lot of data are collected across states, counties, and cities, not all are comparable across those entities and many include limited information about social outcomes. There are many issues that we and external stakeholders we consulted wished to include in the index, but could not due to data availability or due to the nature of state-level issues versus within-state issues. These include data on racial segregation and disparities, incarceration, green space, youth bullying, and more.

We hope that an outcome of this Social Progress Index, beyond its usefulness for improving policy and social progress, is improvement in data collection efforts. In order to understand people's lived experiences, we must collect data that matter and can best inform decision-making as it relates to social progress.

Finally, this index is a starting point for understanding social progress across the United States. We acknowledge the variation in people's experiences within states and realize that measures that capture this variation are indispensable for designing smarter, more inclusive policies and growth strategies. Accordingly, we hope to more fully analyze social progress at the regional, county, and city levels through partnerships with local government, business, and non-governmental agents across the United States.



## Appendix A: Indicator Definitions and Sources

Component	Indicator name	Indicator definition	Data source	Data year <sup>1</sup>	Data source link
Basic Human Need	s				
Nutrition and Basic Medical Care	Food insecurity (% of households)	Percentage of households with low or very low food security that do not have access at all times to enough food for an active, healthy life for all household members	USDA	2016	https://www.ers.usda.gov/topics/f ood-nutrition-assistance/food- security-in-the-us/key-statistics- graphics/#map
	Maternal mortality (deaths/100,000)	Deaths per 100,000 from maternal hemorrhage; maternal sepsis and other maternal infections; maternal hypertensive disorders; maternal obstructed labor and uterine rupture; maternal abortion, miscarriage, and ectopic pregnancy; indirect maternal deaths; late maternal deaths; other maternal disorders; maternal deaths aggravated by HIV/AIDS	Institute for Health Metrics and Evaluation	2014	<u>http://ghdx.healthdata.org/us-</u> <u>data</u>
	Infant mortality rate (deaths/1,000)	Infant deaths per 1,000 (8-year average)	Centers for Disease Control and Prevention	2014	https://wonder.cdc.gov/controller/ datarequest/D69
	Youth preventative medical (% of pop.)	Percentage of children aged 12-17 years who have had one or more preventative medical care visits during the past 12 months.	Data Resource Center for Child & Adolescent Health	2016	http://childhealthdata.org/browse/ allstates?q=4554
	Youth preventative dental (% of pop.)	Percentage of children aged 1-17 years who have had a preventative dental visit in the past year.	Data Resource Center for Child & Adolescent Health	2016	http://childhealthdata.org/browse/ survey/allstates?q=4558
Water and Sanitation	Clean and safe water (% of pop.)	Percent of respondents who responded easy to the question, "In the city or area where you live is it easy or not easy to get clean and safe water?"	Gallup	2013	https://ga.gallup.com
	Drinking water violations (0=high percent; 6=low percent)	Percentage of public water systems with health-based violations, classified into seven ordinal categories: 0=34% or higher 1=23% to 33.99% 2=13% to 22.99% 3=6% to 12.99% 4=4% to 5.99% 5=2% to 3.99% 6=0% to 1.99%	U.S. Environmental Protection Agency	2016	https://echo.epa.gov/trends/comp arative-maps- dashboards/drinking-water- dashboard?state=Alabama&view =performance&criteria=adv&year view=CY
	Water fluoridation (% of pop.)	Percent of population served by community water systems that are receiving fluoridated water	Centers for Disease Control and Prevention	2014	https://nccd.cdc.gov/oralhealthda ta/rdPage.aspx?rdReport=DOH DATA.ExploreByTopic&isITopic= WFR&isIYear=2014&go=GO
Shelter	Housing problems (% of households)	Percent of occupied households with one or more housing problems (lacks kitchen or plumbing, more than 1 person per room, or cost burden greater than 30%)	U.S. Department of Housing and Urban Development	2014	https://www.huduser.gov/portal/d atasets/cp.html#2006-2014 data

Component	Indicator name	Indicator definition	Data source	Data year¹	Data source link
	Availability of affordable housing (units/100 tenants)	Affordable and available units per 100 tenants at or below Very Low Income threshold. Very Low Income is defined as households with income between 31% and 50% of the median family income in the metropolitan or nonmetropolitan area.	The National Low Income Housing Coalition	2015	http://nlihc.org/sites/default/files/ Gap-Report 2017 interactive.pdf
	Homelessness (% of pop.)	Percent of state population that is homeless	U.S. Department of Housing and Urban Development; American Population Survey; SPI calculations	2017	https://www.hudexchange.info/re source/3031/pit-and-hic-data- since-2007/
	Unsheltered homeless (percent of homeless pop.)	Percent of homeless population that is unsheltered	U.S. Department of Housing and Urban Development	2017	https://www.hudexchange.info/re source/3031/pit-and-hic-data- since-2007/
Personal Safety	Violent crime rate (deaths/100,000)	Number of deaths due to rape, robbery or aggravated assault per 100,000	U.S. Department of Justice Federal Bureau of Investigation	2016	<u>https://ucr.fbi.gov/crime-in-the-u.s</u>
	Murder rate (deaths/100,000)	Number of murders per 100,000	U.S. Department of Justice Federal Bureau of Investigation	2016	<u>https://ucr.fbi.gov/crime-in-the-u.s</u>
	Property crime (incidents/100,000)	Number of property crime incidents per 100,000	U.S. Department of Justice Federal Bureau of Investigation	2016	<u>https://ucr.fbi.gov/crime-in-the-u.s</u>
	Traffic deaths (deaths/100,000)	Number of traffic fatalities per 100,000	National Highway Traffic Safety Administration	2014	<u>https://crashstats.nhtsa.dot.gov/#</u> /
	Perceived safety (% of pop.)	Percent of respondents who responded yes to the question, "Do you feel safe walking alone at night in the city or area where you live?"	Gallup	2013	https://ga.gallup.com
Foundations of We	ellbeing				
Access to Basic Knowledge	Preschool enrollment (% of pop.)	Percent of population aged 3 and 4 years old enrolled in private or public school	American Community Survey	2016	https://factfinder.census.gov/bkm k/table/1.0/en/ACS/16_5YR/S14 01/0100000US.04000
	High school incompletion (% of pop.)	Percent of population aged 18 to 24 who did not complete high school	American Community Survey	2016	https://factfinder.census.gov/bkm k/table/1.0/en/ACS/16_5YR/S15 01/0100000US.04000
	Math proficiency (% proficient)	Percentage of eighth-grade public and nonpublic school students at or above Proficient in National Assessment of Educational Progress (NAEP) mathematics	U.S. Department of Education	2015	https://www.nationsreportcard.go v/reading math 2015/#mathema tics
	Reading proficiency (% proficient)	Percentage of eighth-grade public and nonpublic school students at or above Proficient in National Assessment of Educational Progress (NAEP) reading	U.S. Department of Education	2015	https://www.nationsreportcard.go v/reading_math_2015/#reading

Component	Indicator name	Indicator definition	Data source	Data vear¹	Data source link
	Financial Literacy (0=low; 6=high)	Mean number of questions answered correctly on financial literacy quiz (out of 6)	Financial Industry Regulatory Authority National Financial Capability Study	2015	http://www.usfinancialcapability.o rg/downloads.php
Access to Information and Communications	Urban access to broadband (% without)	Percent of urban population without access to 25 Mbps/3 Mbps broadband	Federal Communications Commission	2016	https://www.fcc.gov/reports- research/reports/broadband- progress-reports/2016- broadband-progress-report
	Rural access to broadband (% without)	Percent of rural population without access to 25 Mbps/3 Mbps broadband	Federal Communications Commission	2016	https://www.fcc.gov/reports- research/reports/broadband- progress-reports/2016- broadband-progress-report
	Income parity in broadband	Percent of households with household income with income of \$75,000 or more with a broadband internet subscription divided by the percent of households with income of less than \$20,000 with a broadband internet subscription (Note: ACS 1-year estimate)	American Community Survey	2016	https://factfinder.census.gov/bkm k/table/1.0/en/ACS/16_1YR/S28 01/0100000US.04000
	Home computer with fixed broadband (% of pop.)	Percent of households with a home computer with fixed broadband (Note: ACS 1-year estimate)	American Community Survey	2016	https://factfinder.census.gov/bkm k/table/1.0/en/ACS/16_1YR/B28 008/0100000US.04000
Health and Wellness	Adult obesity rate (% of pop.)	Percent of adults aged 18 years and older who have obesity	Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System	2016	https://chronicdata.cdc.gov/Nutriti on-Physical-Activity-and- Obesity/Nutrition-Physical- Activity-and-Obesity- Behavioral/hn4x-zwk7
	Prevalence of overweight youth (% of pop.)	Percent of children and adolescents, age 10-17 years, who are overweight or obese (BMI at or above the 85th percentile)	Data Resource Center for Child & Adolescent Health	2014	http://www.childhealthdata.org/br owse/survey/allstates?q=4568
	Life expectancy (age in years)	Life expectancy at birth	Institute for Health Metrics and Evaluation	2014	http://ghdx.healthdata.org/us- data
	Cost burden of treatment (% of pop.)	Percent of respondents who responded yes to the question "Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?" (Age-adjusted prevalence)	Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System	2016	https://nccd.cdc.gov/BRFSSPrev alence/rdPage.aspx?rdReport=D PH BRFSS.ExploreByTopic&irb LocationType=StatesAndMMSA &islClass=CLASS07&islTopic=T OPIC28&islYear=2016&rdRnd=2 8137
	Suicide rate (deaths/100,000)	Age-adjusted rate of deaths from intentional self-harm (five- year estimate)	Centers for Disease Control and Prevention	2015	https://wonder.cdc.gov/ucd- icd10.html
	Drug overdose deaths (deaths/100,000)	Age-adjusted rate of death due to drug overdose	Centers for Disease Control and Prevention	2015	https://www.cdc.gov/drugoverdos e/data/statedeaths.html

Component	Indicator name	Indicator definition	Data source	Data year¹	Data source link
Environmental Quality	Carbon dioxide emissions (million metric tons/capita)	Carbon dioxide emissions measured in million metric tons per capita	U.S. Energy Information Administration; Current Population Survey; SPI calculations	2015	https://www.eia.gov/environment/ emissions/state/
	Air pollution (µg/m <sup>3</sup> )	Estimated average exposure to air pollution in PM2.5 (µg/m³), based on satellite imagery data	Organization for Economic Co- operation and Development	2014	http://stats.oecd.org/Index.aspx? DataSetCode=RWB
	Pesticide exposure (reported exposures/100,000 )	Rate of reported exposures to all pesticides per 100,000 people	Centers for Disease Control National Environmental Public Health Tracking Network	2014	https://ephtracking.cdc.gov/Data Explorer/
	Renewable energy consumption (% of total energy)	Renewable energy consumption as a share of state total	U.S. Energy Information Administration	2015	https://www.eia.gov/state/seds/d ata.php?incfile=/state/seds/sep sum/html/sum_btu_totcb.html&si d=US&sid=AL
Opportunity					
Personal Rights	Women in state legislatures (% of leg.)	Proportion of women in state legislatures	Center for American Women and Politics	2017	http://www.cawp.rutgers.edu/curr ent-numbers
	Voter turnout (% of pop.)	Percentage of eligible voters voting for highest office	United States Election Project	2016	http://www.electproject.org/2016 g
	Robust election process (0=low; 100=high)	Score on the Election Performance Index, which tracks 17 distinct indicators of election performance, including: data completeness, disability- or illness-related voting problems, mail ballots rejected, mail ballots unreturned, military and overseas ballots rejected, military and overseas ballots unreturned, online registration available, postelection audit required, provisional ballots cast, provisional ballots rejected, registration or absentee ballot problems, registrations rejected, residual vote rate, turnout, voter registration rate, voting information lookup tools available, and voting wait time.	Pew Charitable Trusts	2014	http://www.pewtrusts.org/en/multi media/data- visualizations/2014/elections- performance-index#indicator
	Corruption (6=low; 30=high)	The sum of corruption perceived among journalists across six categories of corruption: illegal corruption in the Executive, Legislative and Judicial branches, and legal corruption across the Executive, Legislative and Judicial branches (each rated separately.)	Harvard University Center for Ethics	2014	https://ethics.harvard.edu/blog/m easuring-illegal-and-legal- corruption-american-states- some-results-safra
Personal Freedom and Choice	Early marriage (marriages/1,000)	Number of 15- to 17-year-olds married per thousand	Pew Research Center	2014	http://www.pewresearch.org/fact- tank/2016/11/01/child-marriage- is-rare-in-the-u-s-though-this- varies-by-state/ft_16-10- 14_childmarriageus/

Component	Indicator name	Indicator definition	Data source	Data year <sup>1</sup>	Data source link
	Teenage birth rate (births/1,000)	Number of births per 1,000 females aged 15–19 years.	Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report	2014	<u>https://www.cdc.gov/mmwr/volu</u> <u>mes/65/wr/mm6516a1.htm</u>
	Quality of public transportation	The AllTransit Performance Score is an overall transit score that looks at connectivity, access to jobs, and frequency of service.	AllTransit	2013	http://alltransit.cnt.org/rankings/
	Like what I do every day (% of pop.)	Percent of respondents who agreed or strongly agreed with the statement, "I like what I do everyday"	Gallup	2016	https://ga.gallup.com
Inclusiveness	Gender pay gap (dollars)	The dollar value that a woman earns for every dollar a man earns	National Women's Law Center	2016	https://nwlc.org/wp- content/uploads/2017/09/Wage- Gap-State-By-State-2017.pdf
	Employment discrimination (charges/100,000)	Employment discrimination charges per 100,000 of population based on sex, national origin, religion, color, retaliation, age, disability, equal pay, or genetic information	U.S. Equal Employment Opportunity Commission; SPI calculations	2016	https://www1.eeoc.gov/eeoc/stati stics/enforcement/state 16.cfm
	Acceptance of legal immigration (% of pop.)	Percent of respondents who believe the immigration system should allow immigrants who are currently living in the U.S. illegally a way to become citizens provided they meet certain requirements or allow them to become permanent legal residents, but not citizens	Public Religion Research Institute	2016	http://ava.prri.org/#immigration/2 016/States/immigration_reform/1, 2
	Support of same- sex marriage (% of pop.)	Percent of respondents who responded favor or strongly favor to the question: "All in all, do you strongly favor, favor, oppose or strongly oppose allowing gay and lesbian couples to marry legally?"	Public Religion Research Institute	2016	http://ava.prri.org/#lgbt/2016/Stat es/lgbt_ssm/m/
	Access to disability support services (% of pop.)	Percent of individuals with intellectual or developmental disabilities receiving home and community-based services through Medicaid	The Case for Inclusion United Cerebral Palsy	2014	http://cfi.ucp.org/data/
	Hate group concentration (groups/100,000)	Number of hate groups (defined as groups that have beliefs or practices that attack or malign an entire class of people, typically for their immutable characteristics) per 100,000 of population.	Southern Poverty Law Center	2016	https://www.spicenter.org/hate- map
Access to Advanced Education	Percent with 2- or 4-year college degree (% of pop.)	Percent of population aged 25 or older with an associate's or bachelor's degree	American Community Survey	2016	https://factfinder.census.gov/bkm k/table/1.0/en/ACS/16_5YR/S15 01/0100000US.04000
	Percent with an advanced degree (% of pop.)	Percent of population aged 25 or older with a graduate or professional degree	American Community Survey	2016	https://factfinder.census.gov/bkm k/table/1.0/en/ACS/16_5YR/S15 01/0100000US.04000
	College retention rate (% of pop.)	Percent of first-time college freshmen returning their second year, based on institutional data from each state	National Information Center for Higher Education Policymaking and Analysis	2015	http://www.higheredinfo.org/dbro wser/?year=2015&level=nation& mode=data&state=0&submeasur e=223

<sup>1</sup>All data are most recent as of December 15, 2017.

## Appendix B: Principal Component Analysis Weights

Indicator	Unscaled	Scaled
Food insecurity (% of households)	0.28	0.21
Maternal mortality (deaths/100,000)	0.27	0.21
Infant mortality rate (deaths/1,000)	0.30	0.22
Youth preventative medical (% of pop.)	0.22	0.16
Youth preventative dental (% of pop.)	0.27	0.20
Clean and safe water (% of pop.)	0.51	0.37
Drinking water violations (0=high percent; 6=low percent)	0.51	0.38
Water fluoridation (% of pop.)	0.34	0.25
Housing problems (% of households)	0.33	0.28
Availability of affordable housing (units/100 tenants)	0.33	0.28
Homelessness (% of pop.)	0.28	0.23
Unsheltered homeless (percent of homeless pop.)	0.25	0.21
Violent crime rate (deaths/100,000)	0.28	0.22
Murder rate (deaths/100,000)	0.29	0.23
Property crime (incidents/100,000)	0.27	0.22
Traffic deaths (deaths/100,000)	0.15	0.13
Perceived safety (% of pop.)	0.25	0.20
Preschool enrollment (% of pop.)	0.16	0.13
High school incompletion (% of pop.)	0.27	0.22
Math proficiency (% proficient)	0.28	0.23
Reading proficiency (% proficient)	0.28	0.23
Financial Literacy (U=low; 6=nign)	0.24	0.20
Urban access to broadband (% without)	0.32	0.26
Rural access to broadband (% without)	0.28	0.23
Income parity in broadband	0.27	0.22
Adult abasity rate (% of pap.)	0.34	0.20
Reveloped of every light youth (% of pop.)	0.20	0.20
Life expectancy (age in years)	0.24	0.10
Cast burden of treatment (% of pen )	0.25	0.19
Suicide rate (deaths/100.000)	0.25	0.13
Drug overdose deaths (deaths/100.000)	0.15	0.11
Carbon dioxide emissions (million metric tons/capita)	0.38	0.12
Air pollution (ug/m <sup>3</sup> )	0.37	0.20
Pesticide exposure (reported exposures/100.000)	0.38	0.24
Renewable energy consumption (% of total energy)	0.41	0.27
Women in state legislatures (% of leg.)	0.27	0.22
Voter turnout (% of pop.)	0.35	0.28
Robust election process (0=low; 100=high)	0.35	0.28
Corruption (6=low; 30=high)	0.28	0.23
Early marriage (marriages/1,000)	0.34	0.24
Teenage birth rate (births/1,000)	0.40	0.29
Quality of public transportation	0.30	0.22
Like what I do every day (% of pop.)	0.34	0.25
Gender pay gap (dollars)	0.24	0.17
Employment discrimination (charges/100,000)	0.18	0.13
Acceptance of legal immigration (% of pop.)	0.23	0.17
Support of same-sex marriage (% of pop.)	0.29	0.21
Access to disability support services (% of pop.)	0.23	0.17
Hate group concentration (groups/100,000)	0.21	0.15
Percent with 2- or 4-year college degree (% of pop.)	0.40	0.36
Percent with an advanced degree (% of pop.)	0.40	0.35
College retention rate (% of pop.)	0.34	0.30



	Mean	Std. Dev.	Min	Мах
Social Progress Index	48.04	9.20	27.18	64.82
Basic Human Needs	55.83	10.48	27.47	74.82
Foundations of Wellbeing	44.53	10.02	18.78	62.33
Opportunity	45.42	10.28	19.41	64.32
Nutrition and Basic Medical Care	51.74	11.11	23.43	77.74
Water and Sanitation	62.06	14.59	25.02	93.10
Shelter	61.16	16.07	14.06	86.66
Personal Safety	54.04	16.46	14.34	81.08
Access to Basic Knowledge	46.06	11.79	22.62	69.86
Access to Information and				
Communications	51.58	15.61	7.49	80.54
Health and Wellness	36.86	9.89	12.86	56.49
Environmental Quality	47.21	10.19	24.57	74.04
Personal Rights	53.93	11.44	32.39	77.38
Personal Freedom and Choice	46.16	12.02	9.94	62.33
Inclusiveness	49.49	12.00	20.59	74.54
Access to Advanced Education	36.28	13.17	11.69	83.17

## Appendix C: Descriptive Statistics

