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SUSTAINABLE URBAN DEVELOPMENT INDICATORS FOR THE UNITED STATES

*Report to the Office of International and Philanthropic Innovation,
Office of Policy Development and Research, U.S. Department of Housing and Urban Development*

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Appendix D: Sustainable Urban Development Indicator Matrix (14 July 2011)

Livability Principle 1: Provide more transportation choices.

Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

Principle Themes	Framework Elements	Single-Dimension Indicators*	Multi-Dimensional Indicators**	Rec. Indicator
1.1. Commute Mode/Mode Share	- Access to a variety of transportation options - Carbon efficient, environmentally sound, transportation - Efficient resource use	- Ratio of registered taxis to total city population (PWC) - Air Miles Traveled (Seattle, Adapted from PWC) - Number of automobiles per capita (GCIF) - Number of two wheeled vehicles per capita (GCIF)	- Linear distance of dedicated public transit and bike routes per capita (Adapted from GCIF, Minneapolis, Seattle) - Percent of miles traveled (or trips) taken by sustainable modes (walking, biking, public transportation) as a fraction of miles traveled by private auto (Eurofound, Houston) - Linear distance of bike lanes in roadways (Minneapolis, Seattle) - Ratio of road to transit expenditures per capita (GCIF) - Annual number of transit trips per capita (GCIF) - Percent of persons commuting via transit (Houston) - Percent of population commuting via bus (Portland) - Percent of people entering downtown by transit (Minneapolis) - Number of users of bikeways (Minneapolis) - Average number of households within ¼ mile of transit nodes (Santa Monica)	TBD
1.2. Commute Time/ VMT	- Transportation and other infrastructure coordinated with land use - Efficient land use - Access to a variety of transportation options - Efficient resource use	- Average ridership per vehicle (Santa Monica)	- Average weekday vehicle miles traveled (Seattle) - Total # of passenger miles by private car per inhabitant per year (Eurofound)	TBD
1.3. Carbon Emissions	- Access to a variety of transportation options - Transportation and other infrastructure coordinated with land use - Carbon efficient, environmentally sound, transportation - Waste/pollution minimization and management - Climate change and natural disaster mitigation, adaptation, and resilience - Efficient land use	- Percent of vehicles, buses, etc with hybrid or alternative fuel (Santa Monica, Whistler)	- Greenhouse gas emissions in tons per capita (Global Cities, Whistler) - CO2 emitted per capita (PWC) - Total CO2 emissions in metric tons per year (Central Texas)	TBD

* Single-Dimension Indicators – Relate to the theme, elements and only ONE dimension of sustainability.

** Multi-Dimensional Indicators – Relate to the theme, elements and more than one dimension of sustainability. Color indicates dimension of sustainability: Social Wellbeing Economic Opportunity Environmental Quality
 Indicators used in more than one reviewed system are in **bold**. (From Working Group Framework)

Livability Principle 2: Promote equitable, affordable housing.

Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.

Principle Themes	Framework Elements	Single-Dimension Indicators*	Multi-Dimensional Indicators**	Rec. Indicator
2.1. Housing Affordability	- Access to decent – affordable housing and services. - Access to capital and credit - A diversified and competitive local and regional economy	- Number of homeless per 100,000 population (GCIF) - Percent change in homelessness since last measure (Seattle) - Number of homeless receiving services (Seattle) - Percentage of people affected by poor housing environments – those registering demands for good housing (Euro Found)	- Gap between price of affordability for a typical household and median price of market-rate housing (Seattle, GCIF) - Gap between price of affordability for a typical rental household and median price of market-rate rental housing (adapted from Seattle, GCIF) - Ratio of housing units to population (Seattle) - Percent of houses affordable to buyers at 30%, 30 – 49%, and 50 – 79% of median income (Seattle) - Percent of units affordable to renters at 30%, 30 – 49%, and 50 – 79% of median income (Seattle) - Public dollars spent on low income housing (Seattle) - Percent of households paying more than 30% of income for homeownership or rent (Seattle) - Percent of annual working class income spent on housing (Seattle) - Percent of rent-controlled housing stock affordable to low and very-low income residents (Santa Monica)	TBD
2.2. Equity in Housing (esp. as relates to mobility and location)	- Access to decent – affordable housing and services. - Access to a variety of transportation options - Access to recreation and open space - Transportation and other infrastructure coordinated with land use - Access to education, jobs, and training		- Median house size of new construction (Seattle) - Households within ¼ mile of a neighborhood center (Seattle) - Percentage of low-income households within ¼ mile of a neighborhood center (Adapted from Seattle) - Percentage of households within ¼ mile of a transit stop (Seattle, Santa Monica) - Percentage of low-income households within ¼ mile of a transit stop (Adapted from Seattle) - Percentage of new low-income residential new construction within ¼ mile of a transit stop (Adapted from Seattle).	TBD
2.3. Housing Energy Efficiency	- Transportation and other infrastructure coordinated with land use - Carbon efficient, environmentally sound, transportation - Waste/pollution minimization and management - Climate change and natural disaster mitigation, adaptation, and resilience	- Number of houses certified as energy efficient by certification organizations, e.g. LEED (Adapted from Portland)	- Median energy consumption per household (adapted from Eurofound, Whistler) - Median house size of new construction (Seattle)	TBD

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Livability Principle 3: Enhance economic competitiveness.

Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.

Principle Themes	Framework Elements	Single-Dimension Indicators*	Multi-Dimensional Indicators**	Rec. Indicator
3.1. Educational Resources and Investment	- Access to decent – affordable housing and services. - A diversified and competitive local and regional economy - Access to education, jobs, and training	- Student/teacher ratio (GCIF) - Performance on standardized tests (GCIF) - Literacy Rate (Seattle) - Number of institutions of higher learning within 500km (GCIF) - Share of top 100 universities in the country (adapted from PWIC)	- High school graduation rate (GCIF, Seattle, Santa Monica) - Percent of population with a university-level education or higher (PWIC, adapted from GCIF) - Percentage of city population enrolled in institutions of higher learning (GCIF) - Percent of Population with a high school-level education or higher (Seattle) - Percentage of high school graduates attending college (Santa Monica)	TBD
3.2. Agglomeration	- Access to decent – affordable housing and services. - Access to a variety of transportation options - Transportation and other infrastructure coordinated with land use - A diversified and competitive local and regional economy - Access to education, jobs, and training - Efficient land use	- Number of "Global 500" corporations per city defined as top 500 global corporate headquarters (PWC) - Proportion of employees in the financial and business sector services to the total city workforce (PWC)	- Jobs housing ratio (GCIF)	TBD
3.3. Access to Capital, Credit, and Markets	- Access to decent – affordable housing and services. - Access to credit and capital - A diversified and competitive local and regional economy	- Number of Internet Connections per 100K Population (GCIF) - Number of Cell Phones per 100K population (GCIF) - Number of Patents per 100K pop (GCIF) - Venture Capital Investment (GCIF) - Percentage of penetration of mobile phones (PWC) - Market Capitalization of Stock issued for Local Companies (PWC) - Bank and Thrift Performance at Meeting CRA Guidelines (Seattle)	- Consumer Price Index (PWC)	TBD

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Indicators used in more than one reviewed system are in **bold**.

Livability Principle 4: Support existing communities.

Target federal funding toward existing communities—through strategies like transit oriented, mixed-use development, and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.

Principle Themes	Framework Elements	Single-Dimension Indicators*	Multi-Dimensional Indicators**	Rec. Indicator
4.1. Compact, Transit-Oriented Development	- Access to decent – affordable housing and services. - Access to a variety of transportation options - Transportation and other infrastructure coordinated with land use - Efficient land use - Efficient resource use - Carbon efficient, environmentally sound transportation	- Cost of the longest transit trip (PWC) - Ratio of road to transit expenditures per capita (GCIF)	- Linear distance of high capacity public transit per 100K population (GCIF, PWC) - Linear distance of light transit per 100K population (GCIF, PWC) - Linear distance of bike lanes in roadways (Minneapolis, Seattle) - Average number of housing units per acre (Whistler) - Average number of households within ¼ mile of transit nodes (Santa Monica) - Residential density within the CBD - or 1 mile of the 100% corner of the city or a proportional distance to the edge (Adapted from Santa Monica) - Percent of persons commuting via transit (Houston) - Linear distance of dedicated public transit and bike routes per capita (Adapted from Minneapolis) - Walkscore (walkscore)	TBD
4.2. Efficient Land and Resource Use	- Access to decent – affordable housing and services. - Access to public recreation and open space - A diversified and competitive local and regional economy - Transportation and other infrastructure coordinated with land use - Efficient land use - Efficient resource use - Waste/pollution minimization and management - A diverse natural environment and functional ecological systems	- Percentage of water lost in conveyance (GCIF, Eurofound) - Percentage of municipal solid waste recycled (PWC, Adapted from Portland) - Percentage of renewable energy in municipal operations (Minneapolis) - The annual amount of carbon dioxide emissions in metric tons divided by the city population (PWC)	- Energy consumption per capita (Eurofound, Central Texas, Adapted from Whistler) - Water use (Residential, Industrial, and Agricultural) use per capita in gallons per capita per day (Central Texas, Whistler) - Total solid waste production in pounds per person per day (Central Texas, Adapted from Whistler) - Co2 emissions per capita (PWC, Adapted from Central Texas and Minneapolis) - Percentage of brownfield/infill development as a percentage of total development (Seattle) - Acres of vacant or brownfield coverage (as a percentage of total urbanized area) (Adapted from Seattle) - Acres zoned for mixed-use development (Seattle) - Change in acres of impervious surface and forest cover over the past year (Seattle) - Acres converted to 'developed' uses per population change (Adapted from Seattle) - Average well depth (Central Texas) - Residential, Industrial, and Agricultural water use as a percentage of total water availability (EPI) - Co2 emissions by the energy sector divided by the total electricity output (EPI)	TBD
4.3. Clean, Healthy, and Functional Natural	- Health - Safety - Local or civic identity/sense of place	- Acres in forestry or farm production (Seattle) - Percentage of EPA/IUCN/State designated critical habitat protected (EPI)	- Percentage of water bodies that are classified as 'impaired' by the US EPA (EPI, Seattle) - Percentage of wetlands permanently protected (Adapted from Seattle and Whistler)	

Communities	- A diversified and competitive local and regional economy - Efficient land use - Efficient resource use - Waste/pollution minimization and management - Climate change and natural disaster mitigation, adaptation, and resilience - Carbon efficient, environmentally sound, transportation - A diverse natural environment and functional ecological systems	- Annual Average pH of rainfall (Adapted from Eurofound) - Stream health based upon the benthic index of biotic integrity (Seattle)	- Mean flashiness of streams within the jurisdiction (Seattle) - Protected farmland, forest land, and natural areas (including wetlands) as percentage of total land area (Adapted from Seattle) - Percent of forest cover change per annum (EPI) - The proportion of a city's land area designated as recreational and green spaces to the total land area (PWC) - Acres of open space per 100,000 population (GCIF) - Urban tree canopy coverage as percentage of total urbanized area (Minneapolis) - Percent of households and population within ½ mile of a park (Santa Monica)	
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Livability Principle 5: Coordinate and leverage federal policies and investment.

Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy

Principle Themes	Framework Elements	Single-Dimension Indicators*	Multi-Dimensional Indicators**	Rec. Indicator
5.1. Renewable and Locally Generated Energy	- Access to decent – affordable housing and services - A diversified and competitive local and regional economy - Efficient resource use - Waste/pollution minimization and management	- Percentage of renewable energy used in municipal operations (Minneapolis) - Total renewable energy used in municipal operations (Minneapolis)	- Megawatt-Hours of renewable energy consumed per capita (Central Texas) - Number of renewable energy providers supplying local consumers (Adapted from EPI)	TBD
5.2. State and Federal Support for Local Planning Efforts	- Transportation and other infrastructure coordinated with land use - Growth plans that leverage existing assets - Access to capital and credit	None	None	TBD

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** Multi-Dimensional Indicators – Relate to the theme, elements and more than one dimension of sustainability. (From Working Group Framework)

Indicators used in more than one reviewed system are in **bold**.

Economic Opportunity
Environmental Quality

Livability Principle 6: Value communities and neighborhoods.

Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

Principle Themes	Framework Elements	Single-Dimensional Indicators*	Multi-Dimensional Indicators**	Rec. Indicator
6.1. Public Health	- Health - Access to decent – affordable housing and services - Access to public recreation and open space - Access to a variety of transportation options - A diversified and competitive local and regional economy - Waste/pollution minimization and management - A diverse natural environment and functional ecological systems	- Percent of population with health insurance (Houston, Seattle) - Under age one mortality per 1,000 live birth (Seattle, PWC) - Under age five mortality per 1,000 live births (PWC, Global Cities) - Number of Hospitals (PWC) - Income of health care workers (Houston) - Average number of health centers per neighborhood (Houston) - Number of health care professionals per 100,000 (GCIF) - Percent of students eligible for the Free and Reduced Lunch Programs (Seattle) - Children living in poverty (Seattle) - Proportion of permanent residents with incomes below the cost of living (Whistler) - Percentage of population receiving government financial assistance (GCIF) - Percentage of city population living in poverty (GCIF) - Percent of adults age 18+ who are overweight or obese (Seattle) - Percent of children under age 18 who are overweight or obese (Seattle)	- Number of air quality non-attainment days in the last year (Adapted from Minneapolis, PWC, Eurofound) - Number of days waterways are posted with health warnings or closed (Santa Monica, Adapted from Seattle and Minneapolis) - Toxins released by industrial firms (Central Texas, Seattle) - Number of Certified Organic Farms in a Region (Seattle) - Number of ozone danger (or 'Ozone Action' or 'Air Quality Alert') days in the last year (Adapted from PWC) - Percentage of the population served by a public water provider while the provider was in violation of EPA water quality rules (Central Texas)	TBD
6.2. Public Safety	- Safety - Access to decent – affordable housing and services - A diversified and competitive local and regional economy - Climate change and natural disaster mitigation, adaptation, and resilience. - A diverse natural environment and functional ecological sys.	- Violent crimes per 100,000 population (Santa Monica, GCIF) - Number of police officers per 100,000 (GCIF) - Juvenile crime rate (GCIF) - Gang crime rate (Santa Monica) - Unlawful Incidents per capita (Whistler)	- Total percentage of the population affected seriously by crime or traffic accidents (Euro Found) - Vulnerability of a city to natural disasters - hurricanes, droughts, earthquakes, floods, landslides and volcanic (PWC) - Percentage of the 100-year floodplain that is covered by impervious surface (Adapted from PWC)	TBD
6.3. Sense of Place	- Local or civic identity/sense of place - Access to public recreation and open space - A diversified and competitive local and regional economy - A diverse natural environment and functional ecological systems	- Voter participation as a percentage of the population (Santa Monica, GCIF, Whistler, Houston) - Percent of residents which contacted a city department (Santa Monica) - Percent of residents which attended an art of cultural event (Santa Monica) - Number of active neighborhood organizations (Santa Monica) - Local officials per 100,000 population (GCIF)	- Households within ¼ mile of neighborhood center (Seattle) - Community participation in comprehensive plan updates (Santa Monica) - Total percentage of the population participating in local elections or as active members in associations for urban improvement and quality of life (Eurofound)	TBD