LEED v4.1 CITIES AND COMMUNITIES: EXISTING

April 2, 2019

U.S. Green Building Council

Contents

Scorecard

LEED for Cities and Communities

		Cities	Communities
INTEGRATIVE PROCESS		POSSIBLE: 5	POSSIBLE: 5
Credit	Integrative Planning and Leadership	1	1
Credit	Green Building Policy and Incentives	4	4
NATURAL SYSTEMS AND ECOLOGY		POSSIBLE: 9	POSSIBLE: 9
Prereq	Ecosystem Assessment	REQUIRED	REQUIRED
Credit	Green Spaces	2	2
Credit	Natural Resources Conservation and Restoration	2	2
Credit	Light Pollution Reduction	1	1
Credit	Resilience Planning	4	4
TRANSPORTATION AND LAND USE		POSSIBLE: 15	POSSIBLE: 15
Prereq	Transportation Performance	6	6
Credit	Compact, Mixed Use and Transit Oriented Development	2	2
Credit	Access to Quality Transit	1	1
Credit	Alternative Fuel Vehicles	2	2
Credit	Smart Mobility and Transportation Policy	2	2
Credit	High-Priority Site	2	2
WATER EFFICIENCY		POSSIBLE: 11	POSSIBLE: 11
Prereq	Water Access and Quality	REQUIRED	REQUIRED
Prereq	Water Performance	6	6
Credit	Integrated Water Management	1	1
Credit	Stormwater Management	2	2
Credit	Smart Water Systems	2	2
ENERGY AND GREENHOUSE GAS EMISSIONS		POSSIBLE: 30	POSSIBLE: 30
Prereq	Power Access, Reliability and Resiliency	REQUIRED	REQUIRED
Prereq	Energy and Greenhouse Gas Emissions Performance	14	18
Credit	Energy Efficiency	4	4
Credit	Renewable Energy	6	6
Credit	Low Carbon Economy	4	-
Credit	Grid Harmonization	2	2

MATERIALS AND RESOURCES		POSSIBLE: 10	POSSIBLE: 10
Prereq	Solid Waste Management	REQUIRED	REQUIRED
Prereq	Waste Performance	4	5
Credit	Special Waste Streams Management	1	1
Credit	Responsible Sourcing for Infrastructure	2	2
Credit	Material Recovery	1	-
Credit	Smart Waste Management Systems	2	2

QUALITY OF LIFE		POSSIBLE: 20	POSSIBLE: 20
Prereq	Demographic Assessment	REQUIRED	REQUIRED
Prereq	Quality of Life Performance	6	6
Credit	Trend Improvements	4	4
Credit	Distributional Equity	4	4
Credit	Environmental Justice	1	1
Credit	Housing and Transportation Affordability	2	2
Credit	Civic and Community Engagement	2	2
Credit	Civil and Human Rights	1	1

INNOVATION		POSSIBLE: 6	POSSIBLE: 6
Credit	Innovation	6	6

REGIONAL PRIORITY		POSSIBLE: 4	POSSIBLE: 4
Credit	Regional Priority	4	4

TOTAL		**110**	**110**

40-49 Points	50-59 Points	60-79 Points	80+ Points
CERTIFIED	SILVER	GOLD	PLATINUM

INTEGRATIVE PROCESS (IP)

IP CREDIT: INTEGRATIVE PLANNING AND LEADERSHIP

1 Point

This credit applies to

- Cities
- Communities

Intent

To support high-performance, cost-effective outcomes through an early analysis of the interrelationships among city or community systems.

Requirements

CITIES, COMMUNITIES

Use inter-disciplinary teams and at a minimum ensure the following processes are followed:

1. **Comprehensive Plan:** Develop a comprehensive plan for the city or have a plan which is adopted, reviewed, revised or updated within the last five years that establishes a clear vision and strategy for the future.

Reference:
STAR v2 IP-1: Best Practices & Processes

2. **LEED for Cities or Communities Team:** Assemble and convene an interdisciplinary and cross-departmental team. Include team members from at a minimum three of the following areas of expertise:
   - Development Authority
   - Urban / Master Planning and Design
   - Engineering – Energy and Power; Hydrology; Transportation; Waste
   - Economic Development
   - Urban Ecologist, Biologist or Landscape Architect
   - Construction Management
   - Human Services
   - Education / School Board
   - Sustainability / Resilience Officer
   - Data Officer / Information Technology

   Include any other experts or stakeholders as relevant to the city or community. Conduct regular meetings with the integrative project team to review project status, introduce new team members to project goals, discuss problems, formulate solutions, review responsibilities, and identify next steps.

3. **LEED for Cities Roadmap Development:** Soon after formation of LEED team, conduct at least two workshops to assess and develop the following:
   - Gap Analysis: Assess the existing status of the city or community against the parameters mentioned in LEED prerequisite and credit requirements. Develop a gap analysis report.
   - LEED Goal Setting and Roadmap: Develop a strategic roadmap for the city to achieve the goals set out under LEED for Cities and Communities rating system. Create an action plan that identifies the targeted LEED rating, the credits that have been selected to meet the targeted certification level and the entity accountable for meeting the requirements for each selected credit.

IP CREDIT: GREEN BUILDING POLICY AND INCENTIVES

1-4 Points

This credit applies to

- Cities
- Communities

Intent

To encourage the design, construction, and retrofit of buildings using green building practices.

Requirements

CITIES, COMMUNITIES

Option 1. Buildings owned and/or operated by the local government or development authority (1-2 points Cities, 1-3 points Communities)

- Existing Buildings: Register and certify existing buildings above 5000 square feet (465 square meter) that are owned and/or operated by the local government or development authority to LEED, EDGE or an equivalent green building rating system. The green building rating system must address energy, water, waste, transportation and ecological aspects of the city. Points are awarded as per table below.

Table 1 Points for green buildings

Percentage of buildings registered or certified to LEED or equivalent green building rating system	Cities	Communities
25 to 50%	1	1
50 to 75%	2	2
Above 75%		3

AND

- New Buildings: Adopt policy for all new construction undertaken by the city government or community local authority to achieve LEED or an equivalent green building certification.

AND/OR

Option 2. Green Building Policy and Incentives (2 points Cities)
Provide a minimum of two incentives for LEED or an equivalent green building rating system in the city.

- Structural Incentives: Provide expedited review or permitting processes to buildings achieving certification.
- Structural Incentives: Provide density or height bonus allowing for percentage increases in Floor Area Ratio or other measures of density contingent upon certification.
- Financial Incentives: Provide tax credits for buildings achieving certification.
- Financial Incentives: Provide permitting fee reduction or waivers for buildings achieving certification.

AND / OR

Option 3. Building Performance Disclosure (1-2 points)

- Buildings owned and/or operated by the local government or development authority. (1 point)
    - Collect the annual energy data of jurisdictionally-owned or operated buildings. Track, benchmark, and report the data using tools such as ENERGY STAR Portfolio Manager, Arc Skoru, or a locally developed and recognized tool to help with data organization for on-going performance reporting.

- Include a minimum of 50% of the buildings owned or operated by the jurisdiction or the community that are 5,000 square feet (465 square meters) or greater. The data year reported must be from within the most recent 3-year period.

AND/OR

- Privately owned buildings (1 point)

  - Adopt a program that requires disclosure of energy data from privately owned buildings in the jurisdiction. Disclosure may be to the public, the governing entity, and/or specific users of the building, such as tenants, prospective tenants, potential buyers, or potential lenders.
  - At a minimum, all privately owned nonresidential or multi-family buildings with a gross area of more than 20,000 square feet (1858 square meters), excluding parking, must be included. The data year reported for active programs must be from within the most recent 3-year period.
  - The program must include (i) a legally-enforceable policy or ordinance approved by the local governing body and (ii) a mechanism for reporting, a platform for disclosing individual or aggregated data, such as ENERGY STAR Portfolio Manager, Arc Skoru, or a locally developed and recognized tool, and an annual program report.
  - Provide the timeline for roll out and implementation within the next 3 years.

NATURAL SYSTEMS AND ECOLOGY (NS)

NS PREREQUISITE: ECOSYSTEM ASSESSMENT

Required

This prerequisite applies to

- Cities
- Communities

Intent

To assess existing ecosystem conditions and services provided by ecosystems, built landscapes, and other open spaces to inform the city development along with conservation and restoration efforts.

Requirements

CITIES, COMMUNITIES

Complete and document an ecosystem assessment of the areas that includes the following topics:

1. **Topography**: Contour mapping, unique topographic features, slope stability risks.

2. **Soils**: Natural Resources Conservation Service soils delineation, U.S. Department of Agriculture prime farmland, unique farmland or farmland of statewide or local importance, healthy soils, soils disturbed by previous development and degree of disturbance (local equivalent standards may be used for cities or communities outside the U.S.).

3. **Vegetation and Habitat**: Total existing vegetated area, primary vegetation types, native plants and plant communities, significant tree mapping, identification of top three threatened species as per The IUCN Red List of Threatened Species[1] or local or regional standards, habitat for threatened or endangered species, unique habitat. Identification of top three most damaging invasive plant species and mapping of degraded vegetation and habitats if applicable.

4. **Hydrology and Aquatic Ecosystems**: Special Flood Hazard Areas (SFHA) as determined by FEMA's Flood Insurance Rate Map (FIRM) (or local equivalent for cities or communities outside the U.S.), wetlands, lakes, streams, shorelines; precipitation, rainwater collection and reuse opportunities including overland water flow, water quality, storage capacity of the site and watershed conditions, potable and non-potable water sources; pollution sources and pollutants. Map areas with degraded aquatic ecosystems as applicable.

The survey or assessment should demonstrate the relationships between the features and topics listed above and how these features influenced the city or community strategy and development.

Note: Not all topics apply to every city or community, and each may contain additional important unique elements that are not explicitly addressed here.

References:
LEED v4 BD+C SS Credit: Site Assessment
SITES v2 Section 2: Pre-Design Assessment + Planning

[1] http://www.iucnredlist.org/, Accessed on December 17, 2018.

NS CREDIT: GREEN SPACES

1-2 Points

This credit applies to

- Cities
- Communities

Intent

To provide accessible green spaces to positively impact physical, mental and psychological health and well-being of the community while also enhancing the environmental quality of the city or community.

Requirements

CITIES, COMMUNITIES

Provide easily accessible green space. Points are awarded as per table below.

Table 2. Points awarded for Green Spaces

Green space (square feet per person)	Green space (square meters per person)	Points
121	11.25	1
145	13.5	2

AND

Minimum area of green space must be no less than 7212 square feet (670 square meters).

Reference:
LEED v4 ND NPD Credit: Access to Civic and Public Space

AND

A minimum of 70% of the dwelling units must have a green space within 1/2-mile (800 meters) walking distance[2].

Reference:
STAR Communities V2 BE-6: Public Parkland, Outcome 2: Proximity

Green space is defined as land that is partly or completely covered with trees, shrubs, grass or other vegetation. This includes urban parks, trails and community gardens[3] including roof top or vertical gardens. This does not include schoolyards, playgrounds, public seating areas, public plazas or vacant lots.

[2] Communities can include city level green spaces which are not within the community boundary but are freely accessible to the residents and meet the prescribed requirements.
[3] Adopted from United States Environmental Protection Agency's 'What is Open Space/Green Space?' retrieved from https://www3.epa.gov/region1/eco/uep/openspace.html, Accessed on December 17, 2018.

NS CREDIT: NATURAL RESOURCES CONSERVATION AND RESTORATION

2 Points

This credit applies to

- Cities
- Communities

Intent

To conserve and restore the natural resources within the city or community.

Requirements

CITIES, COMMUNITIES

Option 1. Natural Resource Acreage

- Maintain natural resource acreage at 861 square feet per person (80 square meters per person)[4].

OR

- Maintain natural resource acreage at 11.5% or more of total jurisdictional land area.

Reference:
STAR Communities V2 NS-3: Natural Resource Protection Outcome 1: Natural Resource Areas

Natural resource areas include but are not limited to critical aquifer recharge areas; deserts and arid lands; fish or wildlife habitat, natural deltas or floodplains, steep slopes, natural parkland, forests, geologically hazardous areas, grasslands and prairies, habitats of endangered and threatened species, shorelines and their buffers, streams and their buffers and wetlands. Green spaces as defined under and / or provided under *NS Credit: Green Spaces* can be included within the Natural Resource Acreage.

OR

Option 2. Natural Resource Conservation and Restoration Plan[5]
Have a Natural Resource Conservation and Restoration Plan adopted within the last five years or develop one based on the study carried out under *NS Prerequisite: Ecosystem Assessment* to meet requirements for ANY three of the following ecosystems:

1. **Steep Slopes**:
   - Do not permit development on slopes greater than 40% and do not disturb portions of the land area within 50 feet (15 meters) horizontally of the top of the slope and 75 feet (23 meters) horizontally from the toe of the slope.
   - For undeveloped slopes from 26% to 40%, development can be permitted on 40% of the area.
   - For undeveloped slopes from 15% to 25%, development can be permitted on 60% of the area.
   - For previously developed slopes (above 15%) restore a minimum of 50% of the slopes with native vegetation or noninvasive adaptive plants within a period of 5 years.

Reference:
LEED v4 ND SLL Credit: Steep Slope Protection

OR

[4] Communities can include natural resource areas within a buffer of 1 km (1000 meters) from the community boundary to demonstrate compliance with the requirement.
[5] In lieu of a consolidated Natural Resources and Conservation Plan, cities and communities may provide individual plans, ordinances, regulations or policies to demonstrate compliance to credit requirements.

If construction is permitted on steep slopes (greater than 15%), adopt a regulation to the effect that development permits and building permits will be issued after reviewing the following for each city or community:

- A general site survey, topographic and land feature survey along with geotechnical evaluation.
- A grading plan that indicates a clear feasibility for roads, driveways and building envelop without massive manipulation of the site.
- A tree and vegetation plan.
- A drainage management plan.
- An erosion control plan that avoids massive manipulation of the site.
- An Environmental Inventory and Assessment to identify environmentally sensitive areas and features to be protected, and to measures avoid, minimize or mitigate environmental impacts of the proposed development and development activities.

Reference:
LEED v4 ND SLL Credit: Steep Slope Protection

2. **Agricultural Land and Food Production:**
   Do not disturb prime farmland, unique farmland, or farmland of statewide or local importance as defined by the U.S. Code of Federal Regulations, Title 7, Volume 6, Parts 400 to 699, Section 657.5 and identified in a state Natural Resources Conservation Service soil survey (or local equivalent for cities or communities outside the U.S.).

Reference:
LEED v4 ND SLL Prerequisite: Agricultural Land Conservation

OR

If the development footprint affects farmland of any category, mitigate the loss by providing alternative area for farming such as rooftop farming or vertical farming in the ratio of 2:1. In addition, plan for farmer's markets in residential areas which will be within 1/2-mile (800-meters) walking distance.

3. **Vegetation and Habitat:**
   - If the site has any threatened or endangered species or ecological communities, as identified during the ecosystem assessment, comply with an approved habitat conservation plan under the U.S. Endangered Species Act (or local equivalent for cities or communities outside the U.S.) for each identified species or ecological community.
   - Conserve any Significant Habitat[6] present within the area.
   - Adopt or enforce an ordinance requiring control of listed top three invasive species or enact a preferred plant ordinance for private and public landscaping.
   - Restore degraded vegetation and habitats within the area, identified during the Ecosystem Assessment. Restoration strategies must be developed based on Society for Ecological Restoration Science & Policy Working Group. 2002, The SER Primer on Ecological Restoration*,* Section 3, Attributes of Restored Ecosystems[7].

References:
SLL Prerequisite: Imperiled Species and Ecological Communities Conservation
LEED v4 ND SLL Credit: Site Design for Habitat or Wetland and Water Body Conservation
SITES v2 Prerequisite 4.2: Control and manage invasive plants
SITES v2 Credit 4.4: Conserve healthy soils and appropriate vegetation
SITES v2 Credit 4.5: Conserve special status vegetation
SITES v2 Credit 4.8: Optimize biomass
STAR Communities V2 Action 2: Policy and Code Adjustment

[6] Significant Habitat for the purpose of this prerequisite is defined as Locally or regionally significant habitat of any size, or patches of predominantly native vegetation at least 150 acres (60 hectares) (even if part of the area lies outside the project boundary); Special status plants which include plants designated as special status in the region. These plants may include, but are not limited to, heritage or legacy trees, specimen trees (as designated by a local tree board), rare vegetation in a unique habitat, and unusual genetic variants of a particular species; and any habitat flagged for conservation under a regional or state conservation or green infrastructure plan.
[7] https://www.ctahr.hawaii.edu/LittonC/PDFs/682_SERPrimer.pdf, Accessed on December 17, 2018.

4. **Aquatic Ecosystems:**
   - Do not permit any development within limits specified below except for minor improvements or comply with the equivalent local or national regulations.
     - Shorelines and coastal areas: Within 200 feet (61 meters) from normal high tide line.
     - Floodplains, rivers and streams: A flood hazard area shown on a legally adopted flood hazard map or otherwise legally designated by the local jurisdiction or the state or entirely outside any floodplain subject to a 1% or greater chance of flooding in any given year.
     - Wetlands: Within 50 feet (15 meters) of a wetland, except for minor improvements.
     - Water bodies: Within 100 feet (30 meters) of a water body which is greater than 50 contiguous acres (20 hectares) and within 50 feet (15 meters) for waterbodies less than 50 contiguous acres (20 hectares).
   - Restore degraded aquatic ecosystems identified during the Ecosystem Assessment. Restoration strategies must be developed based on Society for Ecological Restoration Science & Policy Working Group. 2002, The SER Primer on Ecological Restoration, Section 3, Attributes of Restored Ecosystems.

References:
LEED v4 ND SLL Prerequisite: Wetland and Water Body Conservation
SITES v2 Prerequisite 1.3: Conserve aquatic ecosystems
SITES v2 Credit 3.6: Restore aquatic ecosystems

OR

Demonstrate a local Watershed Health Index of greater than or equal to 70.

References:
STAR Communities V2 NS-5: Water in the Environment Outcome 1: Watershed Health Index

NS CREDIT: LIGHT POLLUTION REDUCTION

1 Point

This credit applies to

- Cities
- Communities

Intent

To minimize and manage ambient light levels to protect public health and the integrity of ecological systems and increase the night sky access, improve nighttime visibility, and reduce the consequences of development for wildlife and people.

Requirements

CITIES, COMMUNITIES

Option 1.
Achieve a sky glow at or below 4 in the Bortle Dark-Sky Scale where the Milky Way is still visible in residential areas, or a Sky Quality Meter reading of 21.2 or greater.

Reference:
STAR v2 BE-1: Ambient Noise & Light

OR

Option 2.

- A minimum of 70% of the street lighting in the city or community should meet the requirements of section on Glare and Sky-Glow requirements of 'ANSI/IESNA RP-8-14 Roadway Lighting'.

  AND

- Adopt a lighting ordinance for the city or community conforming to the Section II to VI of the Model Lighting Ordinance (MLO), 2011[8] developed jointly by the International Dark Sky Association and Illuminating Engineering Society.

[8] http://darksky.org/wp-content/uploads/bsk-pdf-manager/16_MLO_FINAL_JUNE2011.PDF, Accessed on December 17, 2018.

NS CREDIT: RESILIENCE PLANNING

4 Points

This credit applies to

- Cities
- Communities

Intent

To strengthen the resilience of communities to climate change risks, natural and man-made hazards and extreme events.

Requirements

CITIES, COMMUNITIES

Vulnerability and Capacity Assessment (2 points)
Identify the local environmental context and conduct a vulnerability and capacity assessment for climate change risks, natural and man-made hazards and extreme events as per the table below.

Table 3. Classification of impacts for Vulnerability and Capacity Assessment

Natural		Man-made	
Geo Physical	Earthquake	Social	Complex Emergencies/Conflicts
	Landslide		Displaced Populations
	Tsunami		Cyber Attack
	Volcanic Activity	Technological	Infrastructure failure
Hydrological	Avalanches		Fire
	Flood	Industrial	Explosion
Climatological	Extreme Temperatures		Accidents
	Drought		Accidents on Road, Air, Railway, Maritime
	Wildfires	Transport	Air and Water
	Extreme heat/cold	Pollution	Air and Water
	Heat Island Effect		
Meteorological	Cyclones		
	Storms/Wave Surges		
Biological	Disease Epidemics		

Requirements for vulnerability and capacity assessment:

- **Risk Identification** – Identify the impacts from which an area is at risk. Use national/state level maps and historic data of occurrence to identify the potential threats.
- **Risk Assessment** – Estimate the probability of occurrence of the extreme events. Study their characteristics, frequency and potential severity. Conduct a socio-economic and environmental assessment of the impact.
- **Vulnerability and Capacity Assessment** – Assess the most exposed and affected sections of the city or community.
- **Adaptation and Mitigation Goal** - Set goals based on the vulnerability and capacity assessment. Highlight threats having maximum damage potential and most vulnerable areas that require mitigation strategies. The goal should address the top two natural and man-made hazards.

AND

Resilience Plan (2 points)
Develop a Resilience Plan for the city or community. The plan should meet at least two of the following requirements:

- Climate Adaptation and Mitigation Strategies - Adaptation and mitigation strategies to meet the goals identified under Vulnerability and Capacity Assessment above.
- Fundamental Emergency Planning and Preparedness - Access to basic needs, first aid, emergency supplies, water, food communication, temporary shelter.
- Early Warning Systems - Strategies for early warning systems and operation of critical facilities during the extreme event and post-event rehabilitation. Demonstrate at least one early warning system in practice.
- Critical Infrastructure Location - Map and reduce over time any critical infrastructure that is located in designated high risk areas.
- Policy Intervention - Incorporate building structure resilience strategy to withstand the potential damage due to natural hazards in the building regulations.
- Capacity Building - Design awareness programs to educate different stakeholders (at least one at community level and one at internal administrative level) about hazard management. Plan for implementation the programs at regular intervals for at least one year. The programs should have the provision for revisions after stakeholders' feedback.

References:
RELI v1: Risk Adaptation + Mitigation for Acute Events
STAR v2 CE-1: Climate Adaptation
STAR v2 HS-6: Hazard Mitigation

TRANSPORTATION AND LAND USE (TR)

TR PREREQUISITE: TRANSPORTATION PERFORMANCE

1-6 Points

This prerequisite applies to:

- Cities
- Communities

Intent

To promote non-motorized transportation, encourage use of public transit and reduce pollution from transportation sector.

Requirements

CITIES, COMMUNITIES

Measure the daily per capita Vehicle Miles Travelled (VMT) for the city or community by capturing the commute patterns of the population. Total VMT must be calculated for a minimum period of the most recent calendar year using either of the following methodologies:

- Non-traffic count based
- Traffic count based
- Transportation modeling software derived

VMT per capita per day is calculated by dividing the total VMT for the city or community for a period of the most recent calendar year by total population of the city (Use USGBC population calculator based on residing and floating population). Divide this by 365 to get daily VMT per capita. Document the assumptions for differing day/night and seasonal populations if variations significantly alter travel patterns.

Obtain a minimum transportation performance score of 40. Additional points for this prerequisite are awarded for transportation performance scores above 40, according to the table given below.

Table 4. LEED Points for Transportation Performance

Transportation Performance Score in Arc	Points
40	Prerequisite
50	1
60	2
70	3
80	4
90	5
100	6

Transportation Performance Score

VMT is a metric that measures the number of miles travelled by a vehicle or a fleet of vehicles. Traffic counts measure the number of vehicles passing a fixed point during a specified time. VMT includes trip distance with the traffic volume. For example, 10,000 vehicles each traveling an average of 15 miles per day (24 kilometers per day) would result in 150,000 vehicle miles travelled per day. VMT is useful as a descriptor of changes in travel demand in an urban area. As trip lengths increase, VMT goes up. Trip lengths are a function of the relative locations of residences, jobs, schools, and retail. As the number of vehicle trips increase, VMT again goes up. Factors affecting the number of vehicle trips made each day include age, income, population and household size, workers per household, auto ownership, and access to transit.

The score is a value from 1-100 based on city's or community's VMT per capita.

Performance Score Calculation

To calculate transportation performance score, the following data are required:

1. Total VMT (in miles) for the city or community for a minimum period of one recent calendar year.
2. Total population of the city or community. Consider day time and night time population, permanent and floating population for calculations.

References:
LEED for Cities (Pilot) Transportation
STAR v2 BE-7: Transportation Choices, Outcome 4: Vehicle Miles Travelled

TR CREDIT: COMPACT, MIXED USE AND TRANSIT ORIENTED DEVELOPMENT

1-2 Points

This credit applies to:

- Cities
- Communities

Intent

To encourage compact and mixed use development, high level of connectivity within city or community and encourage walking, biking, and transit use.

Requirements

CITIES, COMMUNITIES

Identify Compact and Complete Centers (CCC) on the master plan or land use map of the city or community. CCCs are measured as areas within a ½ mile (800 meters) walking distance of a central point that represent the strong mix of uses, public transit availability, density, and walkability. CCCs may overlap.

Provide safe and comfortable sidewalks, bikeways and crosswalks that are unobstructed and barrier-free for people with disabilities, including wheelchair users and people with low vision. Comply with Americans with Disabilities Act (ADA) or relevant national or local guidelines for 100% of sidewalks, bikeways and crosswalks.

To qualify as a CCC meet the following requirements:

Access to Transit Facilities
Demonstrate that at least 90% of residential and non-residential buildings within the CCC

- Are within ½ mile (800 meters) walking distance of an existing or planned mass transit station such as bus rapid transit stops, passenger rail stations (i.e. light, heavy, or commuter rail) or commuter ferry terminals.

  AND/ OR

- Are within ¼ mile (400 meters) walking distance of an existing or planned bus, streetcar or informal transit stops that connects to a mass rapid transit station or a pulse point within 3 miles[9] (5 kilometers).

Access to Diverse Uses
Demonstrate that at least 90% of all residential and non-residential buildings within the CCC have access to at least 10 diverse uses (see Appendix 1). Diverse uses should reflect the socioeconomic profile (income, demographics, race and ethnicity) of the CCC.

The following restrictions apply:

- A use may be counted as only one use type (e.g., a retail store may be counted only once even if it sells products in several categories).
- No more than two uses in each use type may be counted (e.g., if five restaurants are within the required distance, only two may be counted).
- The uses accessible to each counted dwelling unit must represent at least two categories.

Points are awarded based on the percentage of population residing in CCCs as per table given below.

[9] TOD guidelines, ITDP

Table 5. Percentage of population residing in CCC

Percentage of population residing within CCCs		Points
Communities	Cities	
Up to 75%	40% to 69%	1
76% and above	70% and above	2

Based on the land use map or master plan, identify areas and total population that reside in mixed use zones and residential zones. Mixed use zone has a balanced mix of uses such as residential (high, medium and low), commercial and institution, open areas and others. Residential zones primarily consist of residential units. The definition of land use zoning should be as per local standard.

- Areas in mixed use zones will be considered to have qualified for a CCC and percentage of population residing in these areas will meet the requirements for this credit.
- For the residential zone, meet all requirements to qualify as a CCC.

References:
STAR v2 BE-3: Compact & Complete Communities
LEED v4 ND NPD Prerequisite: Connected and Open Community
LEED v4 ND NPD Credit: Mixed-Use Neighborhoods

TR CREDIT: ACCESS TO QUALITY TRANSIT

1 point

This credit applies to:

- Cities
- Communities

Intent

To encourage use of diverse transportation modes in order to reduce the reliance on personal vehicles within city or community.

Requirements

CITIES, COMMUNITIES

All cities or communities must disclose data on modal split showing the percentage of population commuting to work and other places by using the following transportation modes, preferably calculated within past one year:

- Drive alone (or chauffeured)
- Carpool
- Motorcycle
- Taxicab
- Public transportation (excluding taxicab)
- Walk
- Bicycle
- Or, other means

Reference:
Variation on STAR v2 BE-7: Transportation Choices Outcome 1

AND

Option 1. Quality of Transit Facilities (1 point)
Provide safe and comfortable transit stops to encourage use of public transport. Ensure the following for at least 80% of transit facilities:

- Covered and partially enclosed to buffer wind and rain, have seating and illumination, has signage that displays transit schedules and route information.
- Minimized interference with pedestrian flow.
- Main roads have right-of-way for public transportation, preferably with dedicated lanes[10].

OR

Option 2. Intermodal Connectivity (1 point)
Ensure that the station is connected to three or more modes of transportation by meeting the requirements of *Option 2, LT Credit: Intermodal Connectivity and Placemaking of LEED v4 BD+C Transit* (Appendix 2).

References:
STAR v2 BE-7: Transportation Choices, Outcome 1 and Outcome 3
LEED v4 BD+C Transit, LT Credit: Intermodal Connectivity and Placemaking

OR

Option 3. Frequency of Trips (1 point)
Ensure that transit stations identified in *TR Credit: Compact, Mixed Use and Transit Oriented Development, 1. Access to transit facilities*, including an existing or planned rapid mass transit station,

[10] TOD Guidelines, EMBARQ

bus rapid transit stops, passenger rail stations (i.e. light, heavy, or commuter rail), commuter ferry terminals, bus, streetcar or informal transit stops, meet the minimum requirement of 72 weekday trips and 30 weekend trips. The transit service at these stops and stations in aggregate must meet the given minimum requirement for each CCC as identified in *TR Credit: Compact, Mixed Use and Transit Oriented Development*. Planned stops and stations may count if they are sited, funded, and under construction during the time of certification.

Both weekday and weekend trip minimums must be met.

- For each qualifying transit route, only trips in one direction are counted towards the threshold.
- For weekend trips, only trips on the day with the higher number of trips are counted towards the threshold.
- If a qualifying transit route has multiple stops within the required walking distance, only trips from one stop are counted towards the threshold.
- Privately-run shuttles are only acceptable if the service is made available to the public.

If existing transit service is temporarily rerouted outside the required distances for less than two years, the project may meet the requirements, provided the local transit agency has committed to restoring the routes with service at or above the prior level.

Reference:
LEED v4.1 BD+C, LT Credit: Access to Quality Transit

TR CREDIT: ALTERNATIVE FUEL VEHICLES

1-2 Points

This credit applies to:

- Cities
- Communities

Intent

To reduce pollution by promoting alternatives to fossil fuel vehicles.

Requirements

CITIES, COMMUNITIES

Option 1. Electric Vehicle Charging Facilities (1 point)
Provide electrical vehicle supply equipment (EVSE) in 2% of all public parking spaces or at least two spaces, whichever is greater. Clearly identify and reserve these spaces for the sole use by plug-in electric vehicles.

The electrical vehicle supply equipment (EVSE) must meet the following requirements:

- Provide a Level 2 charging capacity (208 – 240 volts) or greater.
- Comply with the relevant regional or local standard for electrical connectors, such as SAE Surface Vehicle Recommended Practice J1772, SAE Electric Vehicle Conductive Charge Coupler or IEC 62196 of the International Electrotechnical Commission for cities or communities outside the U.S.
- Vehicle-to-grid (V2G) technology must be capable of responding to time-of-use market signals (e.g. price). Cities or communities pursuing *EN Credit: Smart Energy Systems* should incorporate EVSE into any demand response program or load flexibility and management strategies.

Demonstrate that the number of private and public electric vehicle charging stations exceed 1.07 per 10,000 residents.

OR

Demonstrate compliance with local or national policy for all types of vehicles within the city (privately and publicly owned vehicles or fleet) for electric vehicle charging facilities within the city or community.

AND/OR

Option 2. Alternative Fuel Stations (1 point)
Demonstrate that the total number of government and privately owned alternative fuel[11] stations meet or exceed 1.52 per 10,000 residents.

OR

Demonstrate compliance with local or national policy for providing alternative fuel stations for all vehicles (privately owned vehicles and publicly owned vehicles or fleet) within the city or community.

References:
STAR v2 CE-3 Greening the Energy Supply, Outcome 1
LEED v4 BD+C Transit LT Credit Green Vehicles

[11] Alternative fuel refers to low-polluting, non-gasoline fuels such as hydrogen, propane, compressed natural gas, liquid natural gas, methanol, and ethanol.

TR CREDIT: SMART MOBILITY AND TRANSPORTATION POLICY

2 Points

This credit applies to

- Cities
- Communities

Intent

To promote efficient operation of transport systems, user facilitation, behavior change and reduced environmental impact through smart technologies and transportation policies.

Requirements

CITIES

Adopt any four solutions or policies to support a city-wide smart and efficient transportation system. (2 points)

COMMUNITIES

Adopt any two solutions or policies to support a community-wide smart and efficient transportation system. (2 points)

Indicative list of solutions[12]:

- Passenger Information System (PIS) - At least 80% of all transit stations identified in *TR Credit: Compact, Mixed Use and Transit Oriented Development, 1. Access to transit facilities* must be equipped with PIS system.
- Automated Speed Enforcement - At least 80% of roads to be equipped for automated speed enforcement.
- Traffic Surveillance: At least 80% of all transit stations identified in *TR Credit - Compact, Mixed Use and Transit Oriented Development, 1. Access to transit facilities* must be equipped with CCTVs for traffic surveillance.
- Global Positioning System (GPS)/ General Packet Radio Service (GPRS) - All public transit vehicles must be equipped with GPS/ GPRS system.
- Signal Synchronization and Transit Signal Priority - All signals on major roads must be synchronized or prioritized to address varying traffic flows.
- Integrated Ticketing System - At least 80% of all public transit systems and subsystems to have Automatic Ticketing System.
- Real-time Parking Management - At least 80% of all public and multi-level parking to have real-time parking management system.
  Electronic Toll Collection - All toll booths and plazas to have electronic toll collection system.
- Radio Frequency Identification (RFID) - Adopt RFID technology for logistics and/or for public transportation system.

[12] http://www.grantthornton.in/globalassets/1.-member-firms/india/assets/pdfs/smart-transportation-report.pdf, Accessed on December 17, 2018.

TR CREDIT: HIGH-PRIORITY SITE

2 Points

This credit applies to

- Cities
- Communities

Intent

To preserve historic structures and sites and focus growth and redevelopment to infill and other priority locations.

Requirements

CITIES, COMMUNITIES

Option 1. Historic Preservation (2 points)
This option is applicable to cities or communities with at least one historic building, contributing building in a historic district, or cultural landscape within the city or community boundary.

Develop an inventory of designated and eligible historic structure(s) and site(s). Consider historic buildings that are outside the city or community boundary but may be impacted by development.

Adopt a policy for alteration (rehabilitation, preservation or restoration) of any historic building or a contributing building in a historic district to ensure that following requirements are met:

- Approval in the form of a certificate of appropriateness from a local historic preservation commission or architectural review board for any exterior alterations or additions for building subject to local review.
- Approval in the form of a certificate of appropriateness for alteration from the office in case of buildings subject to state or federal or national review.

OR

Option 2. High-Priority Sites (2 points)

- Refer to an existing inventory or develop an inventory of infill, previously developed, greyfield, brownfield or sites of priority and potential for development or redevelopment.
- Adopt policies, regulations or provide incentives to focus development on infill and/or previously developed site or to cleanup and reuse brownfield and/or greyfield sites.

OR

Option 3. Designated High-Priority Locations (2 points)
Adopt policies, regulations or provide incentives to prioritize growth in high-priority redevelopment areas, as per the list below:

- a site in by the EPA National Priorities List;
- a Federal Promise Zone;
- a Qualified Opportunity Zone;
- a Department of the Treasury Community Development Financial Institutions Fund Qualified Low-Income Community (a subset of the New Markets Tax Credit Program);
- a site in a U.S. Department of Housing and Urban Development's Qualified Census Tract (QCT) or Difficult Development Area (DDA); or
- a local equivalent program administered at the national level for cities or communities outside the U.S.

References:
LEED v4.1 LT Credit: High-Priority Site
LEED v4 ND GIB Credit: Historic Resource Preservation and Adaptive Reuse
STAR v2 EAC-4: Historic Preservation (Action 1)
LEED v4 ND LT Credit: Preferred Locations

WATER EFFICIENCY (WE)

WE PREREQUISITE: WATER ACCESS AND QUALITY

Required

This prerequisite applies to

- Cities
- Communities

Intent

To provide all sections of the society with equitable access to clean drinking water and sanitation services and prevent pollution from stormwater runoff.

Requirements

CITIES, COMMUNITIES

Water and wastewater systems serving the city or community must meet the following requirements:

Water and Sanitation Access
Case 1. 100% coverage of all buildings within the boundary by public water supply and wastewater collection systems including centralized and decentralized systems.

Case 2. For cities which have not achieved a 100% coverage of all buildings within the boundary by public water supply and wastewater collection systems, provide a roadmap for achieving the same within 5 years of certification or at the time of LEED recertification.

Requirement can be met by including private water wells if it is permitted within the local or regional jurisdiction.

Drinking Water Quality
Demonstrate compliance with U.S. EPA's 2018 Edition of the Drinking Water Standards and Health Advisories Tables within the last year (or reporting year) for drinking water rules on chemical and microbial contaminants in drinking water pipes or comply with local, state, or national equivalent.

- Report on enforcement actions taken in case of non-compliance with the adopted drinking water quality standard, under the following categories:
  - Violation of testing frequency
  - Violation in water quality parameter threshold

- Provide the following data for each water supply facility:
  - Frequency of water quality testing (quarterly, monthly, bi-monthly, etc.)
  - Water quality testing parameters

Reference:
STAR v2 BE-2: Community Water Systems, Outcome 1

Treated Wastewater Quality
All centralized or publicly owned and decentralized (on-site, individual systems, septic systems, and others) wastewater treatment systems and wastewater discharged to surface water must comply with U.S. EPA's National Pollutant Discharge Elimination System (NPDES) permit program of Clean Water Act (CWA) or local, state, or national equivalent for 100% of wastewater generated. Meet the water quality parameter thresholds in NPDES permit program manual section 5.1.1 - Secondary and Equivalent to Secondary Treatment Standards.

- Report on enforcement actions taken in case of non-compliance with the adopted wastewater treatment and quality standard, under the following categories:
  - Violation of testing frequency

- Violation in water quality parameter threshold

- Provide the following data for each wastewater treatment facility:
  - Frequency of testing treated wastewater (quarterly, monthly, bi-monthly, etc.)
  - Water quality testing parameters

All wastewater treatment systems that are independently operated onsite or decentralized and are outside the jurisdiction of the city or development authority must disclose the applicable standards for wastewater treatment and discharge.

Reference:
STAR v2 BE-2: Community Water Systems, Outcome 3

Stormwater Quality

CITIES

Adopt a policy to comply with U.S. EPA's National Pollutant Discharge Elimination System (NPDES) permit program for stormwater pollution prevention from construction and industrial activities and municipal sources or local, state, or national equivalent.

Reference:
STAR v2 BE-2: Community Water Systems, Outcome 4

COMMUNITIES

Monitor the quality of stormwater discharged from the community and ensure compliance with U.S. EPA's National Pollutant Discharge Elimination System (NPDES) permit program for stormwater pollution prevention from construction and industrial activities and municipal sources or local, state, or national equivalent.

WE PREREQUISITE: WATER PERFORMANCE

1-6 Points

This prerequisite applies to

- Cities
- Communities

Intent

To support water management by minimizing water use and demand as a means to conserve water in the city or community.

Requirements

CITIES, COMMUNITIES

Measure the daily per capita domestic water consumption within the city. Domestic water consumption must be calculated for a minimum period of the most recent calendar year.

Domestic water is water used for indoor and outdoor household purposes including drinking, cooking, washing, landscaping and sanitation. Domestic water consumption is represented by the amount of water supplied by the public water supply utility or municipality. It may also include some industrial users that receive water from public water treatment facilities rather than well systems. It does not include water withdrawn for non-domestic uses such as agricultural irrigation, golf course irrigation, livestock, aquaculture, mining, or thermoelectric generation.

Applicants must include non-revenue water in the calculations.

Daily domestic water consumption per capita is calculated by dividing the total water consumed for a minimum period of the most recent calendar year by total population of the city (Use USGBC population calculator based on residing and floating population). Divide this by 365 to get Domestic Water Consumption per capita per day. Document the assumptions for differing day/night and seasonal populations if variations significantly alter water consumption patterns.

Obtain a minimum water performance score of 40. Additional points for this prerequisite are awarded for water performance scores above 40, according to table below.

Table 6. LEED Points for Water Performance

Water Performance Score in Arc	Points
40	Prerequisite
50	1
60	2
70	3
80	4
90	5
100	6

Water Performance Score

The Water Performance Score rates the city or community on per capita domestic water consumption in the city compared to the per capita domestic water consumption by comparable cities and communities. Lesser the amount of per capita domestic water consumption, the higher the score will be.

The score is a value from 1-100 based on per capita domestic water consumption.

Performance Score Calculation

To calculate a water performance score, the following data is required:

1. Total domestic water consumption (in million liters or gallons), based on monthly or daily consumption for minimum period of the most recent calendar year.
2. Total population of the city or community. Consider day time and night time population, permanent and floating population for calculations.

References:
LEED v4.1 O+M Water Performance
STAR v2 BE-2: Community Water Systems, Outcome 2
STAR v2 CE-5: Water Efficiency, Outcome 1: Domestic Water Use Per Capita

WE CREDIT: INTEGRATED WATER MANAGEMENT

1 Point

This credit applies to

- Cities
- Communities

Intent

To support water management, reduce freshwater consumption and encourage to move towards a net zero water city or community.

Requirements

CITIES, COMMUNITIES

Adopt an integrated water management process by developing a water balance statement to report on amount of water withdrawn to the amount entering the system through precipitation, river flow and other sources.

Demonstrate that the ratio of water withdrawals for human use to the total freshwater resources is less than 0.2.

Use Water balance calculator that consist of the following to demonstrate flow of water within the city:

1. **Water Availability Assessment**
   Assess the total quantity of water available for use to the city or community.

2. **Water Demand**
   Report on total water demand for all of the following sectors and use types present within the city or community, for past twelve consecutive months (one full year):
   - Buildings – All use types such as residential, commercial, institutional and industrial buildings under the public and private sector.
   - Landscaping for public spaces such as parks, alongside roadways and open spaces.
   - Any other sector as applicable to the city.

3. **Water Supply**
   Measure the total amount of water supplied through various sources for past twelve consecutive months (one full year) sources of water supply may include, but not be limited to the following:
   - Freshwater – Freshwater includes all naturally available water except for seawater and brackish water.
   - Reclaimed water – Reclaimed water includes:
     - Treated wastewater – For each of the sectors identified in Water Demand, identify the wastewater generated. For reusing treated wastewater, provide centralized water treatment plant. Support treated wastewater reuse which is within the scope of the development authority's direct execution, such as at building or community level by adopting appropriate regulations, policies or ordinances. In addition, meet the requirements for wastewater quality as per *WE Prerequisite: Water Access and Quality*.
     - Harvested rainwater – For each of the sectors identified in Water Demand, identify the quantity of stormwater harvested. For harvesting stormwater at city or community level provide stormwater infrastructure. Support stormwater harvesting for areas within the scope of the development authority's direct execution, such as at building or community level by adopting appropriate regulations, policies or ordinances. In addition, meet the requirements for stormwater quality as per *WE Prerequisite: Water Access and Quality*.
     - Desalinated water – Measure the total amount of desalinated water supplied within the city.

Reference:
Variation on STAR v2 BE-2 Community Water Systems Outcome 2

WE CREDIT: STORMWATER MANAGEMENT

2 Points

This credit applies to

- Cities
- Communities

Intent

To reduce runoff volume, prevent erosion, flooding and recharge groundwater.

Requirements

CITIES, COMMUNITIES

Option 1. Flooding Incidences (2 points)

Case 1. No reported flooding[13] incidences in past five years
Provide the following details:

- Precipitation volume for which the stormwater infrastructure has been designed.
- Strategies adopted to manage stormwater beyond its designed limits.
- Trend-line showing reduction in stormwater flooding events over past five years.
- Strategies adopted to inspect and ensure maintenance of existing stormwater facilities.

Case 2. Reported flooding incidences in past five years
Report on areas within the city that have faced flooding.

In a manner best replicating natural site hydrology processes, retain (i.e. infiltrate, evapotranspirate, or collect and reuse) on site the runoff for, at minimum, the 60th percentile of regional or local rainfall for ten-year 24-hr rainfall event data using low-impact development (LID) and green-infrastructure (GI) practices. Refer the methodology given in Part I, Section E of U.S. EPA Section 438 Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects of the Energy Independence and Security Act to obtain 60th percentile rainfall event.

Cities or communities that have taken initiatives to manage stormwater, provide data trend-line showing reduction in stormwater flooding events over past five years. Additionally, provide details on strategies adopted to inspect and ensure maintenance of existing stormwater management facilities. Adopt techniques to infiltrate, evapotranspirate, collect and reuse water for areas, such as pavements, walkways, parks, open spaces and others.

References:
LEED v4 ND GIB Credit: Rainwater Management
SITES v2 Water Prerequisite 3.1: Manage Precipitation on Site
LEED v4.1 BD+C SS Credit: Rainwater Management

OR

Option 2. Green Stormwater Infrastructure (2 points)
Demonstrate that 35% of the jurisdiction's land area has designated green stormwater providing bioretention and infiltration services that are interconnected.

Provide details on strategies adopted to inspect and ensure maintenance of existing stormwater management facilities and techniques to infiltrate, evapotranspirate, collect and reuse water for areas, such as pavements, walkways, parks, open spaces, and others.

Reference:

[13] Flood is the overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas that are not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods, and glacial lake outburst floods. https://www.ipcc.ch/pdf/special-reports/srex/SREX-Annex_Glossary.pdf , Accessed on December 17, 2018.

For cities or communities following Case 2 of Option 1 or Option 2, adopt techniques[14] to infiltrate, evapotranspirate, collect and reuse water for areas such as pavements, walkways, parks, open spaces and others within the city.

[14] Examples of acceptable techniques to achieve above requirements:

- Planting rain gardens with native or adapted plant material (e.g. trees shrubs);
- Installing a vegetated roof;
- Using permeable paving, consisting of porous above-ground materials (e.g., open pavers, engineered products), a base layer designed to drain water away from the building, and (often) a 6-inch-deep (150 millimeters) subbase; and
- Installing permanent infiltration or collection features (e.g., vegetated swale, rain garden, rainwater cistern) that can retain 100% of the runoff from at minimum, the 80th percentile of regional or local rainfall events.

Cities may also refer to Urban Best Management Practice Database and Codes by Maryland Department of Environment that provides a list of BMPs under the category of environmental site design, structural and other practices. https://mde.maryland.gov/programs/water/stormwatermanagementprogram/documents/Urban%20BMP%20Database%20for%20Phase%20II%20MS4s%202016.pdf. Accessed on March 01, 2019.

WE CREDIT: SMART WATER SYSTEMS

1-2 Points

This credit applies to

- Cities
- Communities

Intent

To improve the operational efficiency of the water management systems through use of smart technology.

Requirements

CITIES, COMMUNITIES

Option 1. Water Audit (1 point)

Undertake water audit at least once a year to meet all of the following requirements:

- Address water use inventory, smart metering and water efficiency.
- Measure the amount of municipal water available and total water utilized from both municipal water supply and other sources.
- System efficiency and root-cause analysis for water losses, leaks and infiltration.
- Identify strategies for improving system efficiency.

OR

Option 2. Water Audit and Automation (2 points)

Adopt strategies for automation of water supply system for efficient operation and management by data collection, tracking and monitoring of water supply network and conduct regular water audits.

ENERGY AND GREENHOUSE GAS EMISSIONS (EN)

EN PREREQUISITE: POWER ACCESS, RELIABILITY AND RESILIENCY

Required

This prerequisite applies to

- Cities
- Communities

Intent

To provide safe, secured, reliable, resilient and equitable access to power.

Requirements

CITIES, COMMUNITIES

Power system must meet the following requirements. Cities with multiple utilities or service providers must aggregate the data from the respective utility to demonstrate compliance

Access

Case 1. 100% coverage of households or population by electricity service.

Case 2. For cities which have not achieved a 100% coverage of all coverage of households or population by electricity supply, provide a roadmap for achieving the same within 5 years of certification or at the time of LEED recertification.

AND

Reliability Performance Monitoring
Continuous monitoring (automatic or manual) and recording of interruptions for the complete distribution network at high, medium and low voltage levels.

AND

Power Surety and Resiliency
Identify cities' or communities' critical loads or emergency facilities and essential services that require backup power during widespread outages or disasters. Determine minimum daily runtime requirements for all the emergency facilities and essential services. Demonstrate that the city, utility or service provider can supply power to all emergency facilities and essential services for at least duration greater than the minimum daily runtime for one week or longer.

Off-grid developments or micro-grids are eligible if they independently meet the above requirements and are supported by the city development plans or policies.

References:
PEER v2 RR Prerequisite: Reliability Performance Monitoring
PEER v2 RR Credit: Power Surety and Resiliency

EN PREREQUISITE: ENERGY AND GREENHOUSE GAS EMISSIONS PERFORMANCE

1-18 Points

This prerequisite applies to

- Cities (1 – 14)
- Communities (1- 18)

Intent

To support energy management and move towards a zero energy and emissions city.

Requirements

CITIES, COMMUNITIES

Measure the annual energy consumption and Greenhouse Gas (GHG) emissions for the city or community. The inventory[15] should cover Scope 1 and Scope 2 emissions for one whole calendar year or fiscal year. LEED points are based on Energy and GHG performance on Arc scored on Greenhouse gas emissions per capita (tons CO_2e per capita).

Document the assumptions for differing diurnal and seasonal population if varying numbers are used to arrive at GHG emissions per capita.

Obtain a minimum Energy and GHG Performance Score of 40 on Arc. Additional points for this prerequisite are awarded for Energy and GHG Performance Scores above 40, according to table below.

Table 7. Energy and GHG Performance score in Arc and corresponding LEED for Cities and Communities points

Energy and GHG Performance Score on Arc Score		Points
Cities	Communities	
40	40	Prerequisite
44	44	1
49	48	2
53	52	3
57	56	4
61	60	5
66	64	6
70	68	7
74	70	8
79	73	9
83	76	10
87	79	11
91	82	12
96	85	13
100	88	14

[15] Protocols accepted for GHG inventory: 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Intergovernmental Panel on Climate Change (IPCC)), Baseline Emissions Inventory/Monitoring Emissions Inventory methodology (BEI), (Covenant of Mayors). Bilan Carbone (Association Bilan Carbone (ABC)), Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), Greenhouse Gas Inventory & Research Center of Korea (GIR), International Local Government Greenhouse Gas Emissions Analysis Protocol (IEAP) (ICLEI – Local Governments for Sustainability USA), International Standard for Determining Greenhouse Gas Emissions for Cities (UNEP and World Bank), PAS 2070: Specification for the assessment of greenhouse gas emissions of a city(British Standards Institute (BSI)), U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (ICLEI – Local Governments for Sustainability USA), GHG Protocol for Cities (Greenhouse Gas Protocol).

	91	15
	94	16
	97	17
	100	18

Energy and GHG Performance Score

The Energy Performance Score rates the city or community on GHG emissions of the city or community against the GHG emissions of comparable cities or communities as GHG is an indicator of energy use in the city. Lower the energy use, higher will be the score. The score is a value from 1-100 based on the Energy Performance.

Performance Score Calculation

To calculate Energy and GHG Performance Score, the following data is required:

1. Annual energy consumption from all sectors along with the source of energy.
2. Emissions co-efficient for electricity and all fuel types.
3. Total population of the city or community.

EN CREDIT: ENERGY EFFICIENCY

1-4 Points

This credit applies to

- Cities
- Communities

Intent

To improve sectoral energy efficiency in the city or community.

Requirements

CITIES, COMMUNITIES

Attempt any of the following options for a maximum of 4 points.

Street Lighting and Public Area Lighting (2 points)
A minimum of 70% of the street lighting in the city or community should meet the efficiency related requirements of 'ANSI/IESNA RP-8-14 Roadway Lighting. In addition, lamps should have a minimum Luminous Efficacy of 100 lumens per watt.

AND / OR

Water and Wastewater (2 points)
Meet the requirements of the standard listed below for a minimum of 50% of the pumps used in water supply, drainage and wastewater treatment:

Pump Energy Index listed in Table I.1 - Proposed Energy Conservation Standards for Pumps, 10 CFR Parts 429 and 431 of DOE standards Federal Register final rule Energy Conservation Program: Energy Conservation Standards for Pumps or international equivalent standard.

AND / OR

District Energy System (2 points)
Incorporate a district energy system. For the purposes of this credit, a Distributed Energy Systems (DES) is a heating and/or cooling system that produces steam, hot water, and/or chilled water in a centralized plant using cogeneration or tri-generation and distributes this energy to multiple buildings. Determine the percentage of city's electric, cooling and/or heating load or demand serviced by the DES using the following formula. Single-family residential buildings may be excluded from the calculation.

$$\%\ District\ Energy = \%\ H_{DES} + \%\ C_{DES} + \%\ E_{DES}$$

Where:
$\%H_{DES}$: Percentage of city's or community's heating load or demand supplied by DES
$\%C_{DES}$: Percentage of city's or community's cooling load or demand supplied by DES
$\%E_{DES}$: Percentage of city's or community's electric load or demand supplied by DES

Points are awarded based on percentage of city load supplied by district energy resources as shown in the Table below.

Table 8. Points for Distributed Energy Resources

% District Energy	Points
80 %	1
160 %	2

Community scale DES systems do not qualify for this point under the LEED for Cities rating system. However, they can achieve points under the LEED for Communities rating system pertaining to the boundary.

EN CREDIT: RENEWABLE ENERGY

2-6 Points

This credit applies to

- Cities
- Communities

Intent

To reduce the environmental and economic harms associated with fossil fuel energy and reduce Greenhouse Gas emissions by increasing self-supply of renewable energy and the use of grid-source, renewable energy technologies and carbon mitigation projects.

Requirements

CITIES, COMMUNITIES

Cities or communities may choose one or more strategies for procuring renewable energy (such as solar PV, wind, geothermal, micro or small scale hydro[16], or biomass) from the categories below. Points are based on total city energy consumption from *EN Prerequisite Energy and Greenhouse Gas Performance* met by the specific strategy as per the table given below. Points achieved in each category may be added for up to a total of 6 points.

- **On-Site Renewables:** Includes on-site nonpolluting renewable energy generation, owned, leased or subsidized by the city, utility (or energy provider).

- **New Off-Site Renewables:** Includes large-scale renewable energy plant with a minimum capacity of 1 MW, to meet the energy needs of the city or community. Plant maybe located within or outside the city boundary and should be owned or leased for a period of fifteen years by the city or utility. The plant built within the last year or contracted prior to renewable energy project development. A new or on-going Power Purchase Agreement (PPA) or Virtual Power Purchase Agreement (VPPA) between the city/ community, utility and/or renewable energy provider is acceptable.

- **Existing Off-Site Renewables:** Includes renewable energy procured from an existing renewable energy provider or utility (Contract not required).

- **Green-e Certified RECs and Carbon Offsets:** Includes green-e certified Renewable Energy Certificates (RECs), and/or carbon offsets purchased by the city to mitigate the environmental impacts of city energy consumption; if purchased by the utility or energy provider, RECs and Carbon Offsets must be prorated as per the city's annual energy share in the utility's generation. RECs and carbon offsets must be Green-e certified. Carbon offsets must be purchased from recognized GHG reduction projects within the country where the city is located. For this purpose, engage in a contract for qualified resources that have come online or been built within the last fifteen years. The contract must be for a minimum of fifteen years to be delivered annually. If RECs or carbon offsets are purchased by the utility serving multiple cities, these must be prorated as per the city's annual energy share in the utility's generation.

- **RECs and Carbon Offsets:** Includes other Renewable Energy Credits and Carbon Offsets purchased by the city; if purchased by the utility, RECs and Carbon Offsets must be prorated as per the city's annual energy share in the utility's generation.

Prosumers, Community Choice Aggregation (CCA) or other aggregated consumers) with a minimum on-grid capacity of 2 MW which will be owned and operated by consumers may be included in the calculations based on whether these are on-site or off-site renewables.

[16] Small hydroelectric is limited to capacity of 25 MW or as per national standard.

Environmental benefits of all procurement must be retained by the city or utility. All off-site qualifying resources must be contracted, owned, or leased for at least 15 years.

Table 9. Points for Renewables Procurement

Points	On-Site Renewables	New Off-Site Renewables	Existing Off-Site Renewables	Green-e Certified: RECs and Carbon Offsets	RECs and Carbon Offsets
2	2 %	20 %	60 %	100%	150%
3	6 %	40 %	80 %	200%	
4	15 %	60 %	100 %	300%	
5	35 %	80 %			
6	60 %	100 %			

EN CREDIT: LOW CARBON ECONOMY

2-4 Points

This credit applies to

- Cities

Intent

To progress towards a low carbon economy by decoupling economic growth of the city or community from greenhouse gas emissions.

Requirements

CITIES

Greenhouse Gas Intensity (2 points)
Report the total GHG emissions emitted by the city or community per unit economic output measured in Gross Domestic Product (GDP) produced by the city. Total GHG emissions must be as per *EN Prerequisite Energy and Greenhouse Gas Emissions Performance*.

GDP of the city or community should include the increase in GDP of the region due to the economic activities within the city or community. Data at city level or apportioned metro or state level data must be used.

GHG Intensity = Total GHG of the city / Total GDP

AND/OR

Reduction in Carbon Intensity (2 points)
Demonstrate a reduction in the Carbon Intensity of the economy over a period of three consecutive years.

Reference:
STAR Communities V2 EJ-2: Green Market Development Outcome 1: Greenhouse Gas Intensity

EN CREDIT: GRID HARMONIZATION

2 Points

This credit applies to

- Cities
- Communities

Intent

To improve operational efficiency of the energy system and encourage consumer participation in energy use optimization.

Requirements

CITIES, COMMUNITIES

Option 1. Load Management (2 points)
Have in place (or initiate dialogue with utility to be committed to) infrastructure and programs that provide access to dynamic pricing for metered users to motivate load shifting. Rate structures must be clearly defined, communicated to metered users in a standard format, and easily accessible. At minimum, have a tariff scheme that offers, Time of Use pricing with at least one time block and two tiers for all consumers.

Reference:
PEER v2 GS Credit: Demand Side Management

OR

Option 2. Demand Response (2 points)
Have in place (or initiate dialogue with utility to be committed to) tariff options that support short-term reduction in peak demand. Have in place following tariff structures for residential, commercial and industrial consumer categories at minimum:

- Critical Peak Pricing
- Critical Peak Rebate

Reference:
PEER v2 GS Credit: Demand Response

OR

Option 3. Net Metering and Interconnection Policy (2 points)
Adopt (or be committed to) an Interconnection and Net metering policy. The policy should meet the following requirements that are based on the Standard for Interconnecting Distributed Resources with Electric Power Systems, by Institute of Electrical and Electronics Engineers 1547-2003 or local equivalent.

- Applicability to all renewable generation and energy storage technologies (Distributed Power sources, Electric Vehicles).
- System capacity of 100 kW or more
- Incorporate the following best practices for Interconnection Policies:
  - Provisions for a fast-track, low-cost interconnection process for customers with generation capacity of 100 kW or less (Distributed Power sources, Electric Vehicles).
  - Defined timelines and an engineering fee structure for various stages of the process.
  - Identification of technical standards for interconnection of generation systems (Distributed Power sources, Electric Vehicles).
- Incorporate at least three of the following best practices for Net Metering Policies:
  - Monthly rollover of excess energy to be permitted up to one year.
  - Compensation is provided for excess energy at predefined, nonzero rates.
  - Ownership of renewable energy certificates is offered to the customer.
  - Third-party ownership and meter aggregation are permitted.

References:
PEER v2 EE Credit: Distributed Energy Resources
PEER v2 GS Credit: Streamlined Interconnection and Net Metering

MATERIALS AND RESOURCES (MR)

MR PREREQUISITE: SOLID WASTE MANAGEMENT

Required

This prerequisite applies to

- Cities
- Communities

Intent

To effectively and efficiently manage waste.

Requirements

CITIES, COMMUNITIES[17]

The local government, development authority, or waste management service provider/s must meet the below requirements.

Access
Case 1. 100% coverage of all types of buildings or city population by waste management services for municipal solid waste.

Case 2. For cities which have not achieved a 100% coverage of all types of buildings or city population of all types and applicable buildings by waste management services, provide a roadmap for achieving the same within 3 years of certification or at the time of LEED recertification.

AND

Solid Waste Management Plan
Provide solid waste management plan, adopted or updated within the last five years, to meet the following requirements:

- **Segregation** – Waste must be sorted and segregated. Sorting must be done into minimum four categories - organic, recyclables, electronic waste (e-waste), and others. For areas where source segregation is not undertaken, central sorting facility must be provided.

- **Waste Storage and Collection –** Comply with the 'Requirement' sections of U.S. Code of Federal Regulations, Title 40, Volume 26, Part 243 on Storage, Safety and Collection (or local, state or national equivalent, whichever is more stringent).

- **Waste Handling and Processing Facility –** Total waste collected should be transported to the waste handling and processing facility situated within or outside the city boundary for further handling and processing of organic and inorganic waste. It must be either be centralized or decentralized. This facility must ensure that waste from registered project is only handled by them and not from any other source. In addition, all the organic waste should be stored in non-corrosive container with lid cover and recyclable and e-waste in a place with firm waterproof base at central waste handling and processing facility.
  - Organic waste comprising of all food waste and yard waste i.e. yard trimmings, dry leaves and wasted manure must be transported to organic waste treatment facility for converting it into compost via composting or biogas via anaerobic digestion.
  - All the recyclable waste should be sorted into minimum six categories Including paper, corrugated cardboard, glass, plastic, metal, and send to material recovery facility for treatment. For e-waste management refer *MR Credit Material Recovery*.

[17] Communities must meet all the requirements that are within the scope of the services provided or contracted by the community.

- Landfill should meet the requirements of EPA Landfill Manual or local, state or national equivalent.

- **Material Recovery Facility –** This recycling facility must be designed and operated in accordance to the local / national regulations. All the sorted recyclable waste from waste handling facility must be send to MRF for recycling and further treatment to produce recycled products. These products must be send to suitable markets with vendors situated within the city of outside the city boundary.

Support waste management and diversion strategies which are not directly within the scope of the city or community services must be supported by the appropriate contract with the service provider.

AND

Divert a minimum of 35% of construction and demolition waste from all infrastructure works (new, renovation, repair or demolition) undertaken by the local government.

MR PREREQUISITE: WASTE PERFORMANCE

1-5 Points

This prerequisite applies to

- Cities (1-4 points)
- Communities (1-5 points)

Intent

To support waste management and move towards net zero waste city.

Requirements

CITIES, COMMUNITIES

Measure the total weight of waste (in lbs., kg, or tons) that is generated, and the total weight that is diverted from landfills or incineration for a minimum period of the most recent calendar year. LEED points are based on waste performance in Arc across two metrics:

- Municipal solid waste generated (in metric tons per year per capita)
- Municipal solid waste diverted (% of total generated)

Municipal solid waste generated must include waste generation from all sectors within the city or community including but not limited to residential, institutional, commercial, other sectors and open spaces.

Waste to energy may count as waste diversion method if the facility meets European Commission Waste Framework Directive 2008/98/EC and the European Commission Waste Incineration Directive 2000/76/EC.[18] In addition, cities or communities must demonstrate that reuse and recycling strategies were exhausted before sending material to waste to energy facility.

Construction and demolition waste is not included under this credit. Exclude land clearing debris, soil and landscaping materials.

Document the assumptions for differing diurnal and seasonal population if varying numbers are used to arrive at waste generation per capita.

Obtain a minimum waste performance score of 40. Additional points for this prerequisite are awarded for waste performance scores above 40, according to Table below.

Table 10. Waste Performance Score in Arc and corresponding LEED points

Waste Performance Score in Arc		Points
Cities	Communities	
40	40	Prerequisite
55	52	1
70	64	2
85	76	3
100	88	4
	100	5

[18] These standards consist of performance metrics of both efficiency and emissions for different types of energy recovery systems. In addition, the facility must meet the applicable European standards based on the fuel type. See *Referenced Standards* for more information on these directives:
EN 303-1—1999/A1—2003, Heating boilers with forced draught burners
EN 303-2—1998/A1—2003, Heating boilers with forced draught burners
EN 303-3—1998/AC—2006, Gas-fired central heating boilers
EN 303-4—1999, Heating boilers with forced draught burners
EN 303-5—2012, Heating boilers for solid fuels
EN 303-6—2000, Heating boilers with forced draught burners
EN 303-7—2006, Gas-fired central heating boilers equipped with a forced draught burner

Waste Performance Score
The Waste Performance Score rates the resource consumption and resource use efficiency of the city (waste generated and diverted) against the consumption and efficiency of comparable cities or communities.

The score is a value from 1-100 based on the cities' total weight of waste generated and the total weight of waste diverted from landfills and incineration facilities.

Performance Score Calculation
To calculate the Waste Performance Score, following data is required:
1. Municipal solid waste generated (lbs., kg, or tons)
2. Municipal solid waste diverted (lbs., kg, or tons)
3. Total population of the city or community

MR CREDIT: SPECIAL WASTE STREAMS MANAGEMENT

1 Point

This credit applies to

- Cities
- Communities

Intent

To divert special waste streams from landfill and incinerators and recover and recycle reusable materials.

Requirements

CITIES, COMMUNITIES

Measure and report the total weight of waste generated under special waste streams and the total waste diverted from landfill or incineration. Report data for one full calendar or fiscal year.

Report data for each of following special waste streams:

- Waste generated through special waste streams (in metric tons per year)
- Waste diverted (percentage diverted)

Special wastes are defined as non-municipal solid waste generated within the city or community, including industrial waste, agricultural, bio-medical waste, hazardous waste or any other as specific to the city.[19]

[19] What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050 http://www.worldbank.org/en/topic/urbandevelopment/brief/solid-waste-management , Accessed on December 17, 2018.

MR CREDIT: RESPONSIBLE SOURCING FOR INFRASTRUCTURE

1-2 Points

This credit applies to

- Cities
- Communities

Intent

To encourage use of products and materials for which life cycle information is available and that have been extracted and sourced in a responsible manner.

Requirements

CITIES, COMMUNITIES

Comply with one or more of the following criteria for minimum 20% by cost of the total value of permanently installed-top three materials used in infrastructure. (1 point)

Comply with at least one of the following criteria for minimum 40% by cost, of the total value of permanently installed top five materials used in infrastructure. (2 points)

Include new construction, major renovation, repair or demolition works undertaken or contracted by the local government for a full calendar year. Infrastructure includes but is not limited to roads and highways, transits, water supply and wastewater treatment plants, public spaces and parks.

Material should meet at least one of the following sourcing and extraction requirements:

- **Extended Producer Responsibility (EPR) -** Products purchased from a manufacturer (producer) that participates in an EPR program or is directly responsible for extended producer responsibility. Products meeting EPR criteria are valued at 50% of their cost for the purpose of credit achievement calculations.

- **Leadership Extraction Practices – Material Reuse -** Reuse includes salvaged, refurbished or reused materials/products. Materials meeting reuse criteria are valued 200% of their cost for the purpose of credit achievement calculations.

- **Leadership Extraction Practices – Recycled Content -** Materials meeting recycled content criteria are valued 100% of their cost for the purpose of credit achievement calculations.
  - Recycled content is the sum of postconsumer recycled content plus one half of pre-consumer recycled content, based on weight.
  - The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

- **Leadership Extraction Practices – USGBC Approved Program -** Other USGBC approved program meeting responsible sourcing and extraction criteria.

Reference:
LEED BD+C v4 MR Credit: Building Product Disclosure and Optimization- Sourcing of raw materials.

MR CREDIT: MATERIAL RECOVERY

1 Point

This credit applies to

- Cities

Intent

To recover materials from the waste stream which have a high value and provide mechanism for collection and channelization of these back to the producer thereby moving towards a circular economy.

Requirements

CITIES

Option 1: Extended Producer Responsibility

Collection centers must be provided within the boundary and must be equipped with facilities to collect and store the waste products pertaining to the Extended Producer Responsibility (EPR) Policy in order to transfer these to the manufacturers. Collection centers must be within or outside the city boundary and may be operated by the municipality or other organizations such as Producer Responsible Organizations (PRO).

AND

Mandate a Manufacturers or Producer's Extended Producer Responsibility (EPR) policy for companies within the city's jurisdiction to encourage refurbishment, remanufacturing and recycling. Policy should meet all of the following requirements:

- Address (i) Electronics and Electrical Equipment (EEE) and (ii) packaging or metal cans.
- Include specific guidelines regarding channelization, collection centers, storage, transportation, environmentally sound dismantling, recycling and refurbishment.
- Mandate companies to collect a minimum of 10% of the total annual waste generated. Waste generated by the producer is calculated using the formula:

  E-waste generation in the financial year 'x-y' = Sales in the financial year '(x-z) - (y-z)'
  Where,
  'x – y' = financial year in which generation is estimated (in weight or volume)
  z= average life span of the products

OR

Option 2: Non-recyclable Waste Generation Reporting

- Conduct a waste stream audit for all non-recyclable waste generated within the city, by either weight or volume.
- Based on the waste stream study, identify and list top five major contributing waste producers.
- Report major contribution based on source and total weight or volume of waste generated.
- Municipality must initiate a dialogue with identified producers to take appropriate measures for the safe collection, storage and recycling/reuse to take back product into the system.

Reference:
TRUE Leadership Credit 4: Take Responsibility for Company Products and Packaging

MR CREDIT: SMART WASTE MANAGEMENT SYSTEMS

2 Points

This credit applies to

- Cities
- Communities

Intent

To improve operational efficiency of the waste management system.

Requirements

CITIES, COMMUNITIES

Provide smart waste management systems using any or both of the following to handle a minimum of 20% of the waste generated within the city.

Option 1. Pneumatic Transport Systems

- **Loading Stations** – Public areas and private property with pneumatic transport system will have hatches, called loading stations where the waste will enter the Automatic Waste Collection System (AWCS) pipe network. At this station, a minimum of two pipes one for compostable and another for recyclable waste will run underground.

- **Transport Network** – Underground transport network will have 19 inch (500 millimeters) diameter pipes coated by 3-layer PE coating. PVC conduits containing both the compressed air conduits and system communication control cables will run parallel to the waste pipes.

- **Central Waste Handling Facility** – At central waste handling facility all pipes will transfer waste for compacting and an automated software will direct the compacted waste to the proper container, from there to be trucked for recycling.

AND/OR

Option 2. Smart Bins and Route Optimization

- **Sensor Bins** – Ultrasonic sensors installed in municipal bins to guide fill level of waste and a communication system will transfer this information to the cloud for further processing and analysis.
  - Sensor Bins with Radio Frequency Identification (RFID) technology for e-waste: Electronic waste bins installed with ultrasonic sensors and RFID technology to automatically identify and track tags attached to products. The tags containing electrically stored information will exchange information between cloud and trucks for disposal or directly for the waste bins where the information from each bin is conveyed to the cloud and product recycling can be eased.

- **Route Optimization** – Information analyzed at the cloud will be processed further and sent to waste vehicle operators to optimize the fleet routing for waste collection.

QUALITY OF LIFE (QL)

QL PREREQUISITE: DEMOGRAPHIC ASSESSMENT

Required

This prerequisite applies to

- Cities
- Communities

Intent

To describe the population demographics and housing characteristics of the area.

Requirements

CITIES, COMMUNITIES

Provide a comprehensive demographic narrative that includes the following population and housing characteristics:

- Brief history of development, noting critical points of change for the overall area or specific neighborhoods.
- Age cohorts, including the following categories: Under 18 years, 18 years and over, and 65 years and over.
- Racial/Ethnic composition. [In the U.S., this must include Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, White alone (not Hispanic or Latino), two or more races, and Hispanic or Latino (of any race).]
- Other prominent sociocultural groups present, such as migrants, religious groups, and linguistically isolated.
- Housing market analysis, including total housing units, dwelling units per acre, homeowner vacancy rate, rental vacancy rate, units in structure (including single-unit, duplex, 3 or 4 units, 5 to 9 units, 10 to 19 units, 20 or more units, mobile home, and boat, RV, van, etc.), age of housing (including 2014 or later, 2000 to 2013, 1980 to 1999, 1960 to 1979, 1940 to 1959, and prior to 1939), median value of owner-occupied units, median monthly owner costs, and median rent.

AND

Develop a series of maps (or interactive layers) that provide demographic breakdowns of selected characteristics at the neighborhood or block group scale:

- Demographic Indicators:
    - Minority population,
    - Low income population,
    - Linguistically isolated,
    - Less than HS Education,
    - Under Age 5, and
    - Over Age 64.
- Residential density
- Public Accommodations and Services: Parks, Libraries, Recreation Centers, Schools, Fire Stations, Police Stations, and Healthful retail food outlets

QL PREREQUISITE: QUALITY OF LIFE PERFORMANCE

1-6 Points

This prerequisite applies to

- Cities
- Communities

Intent

To track and measure metrics related to elevating the living standards of all people.

Requirements

CITIES, COMMUNITIES

Measure all of the Quality of Life parameters below for a minimum period of the most recent calendar year or fiscal year. LEED points are based on city performance in Arc (under Human Experience)[20] combined across four categories – Education, Equitability, Prosperity, and Health and Safety.

1. **Education**
   - **Population with (at least) a High School Degree –** Percentage of adult population
   - **Population with (at least) a Bachelor's Degree –** Percentage of adult population

2. **Equitability**
   - **Median Gross Rent as a % of Household Income**
   - **Gini Coefficient** – A number between 0 and 1

3. **Prosperity**
   - **Median Household Income** – Median household income in equivalent US dollars
   - **Unemployment Rate –** Percent of population 16 years and over

4. **Health and Safety**
   - **Median Air Quality Index (AQI)** – A number between 0 and 500[21]
   - **Air Quality Days Unhealthy for Sensitive Groups** – Number of days
   - **Violent Crime –** Per capita[22]

Obtain a minimum Quality of Life Performance score of 40 on Arc. Additional points for this prerequisite are awarded for Quality of Life Performance Scores above 40, according to table below.

Table 11. Points for Quality of Life Performance

Quality of Life (or Human Experience) Performance score in Arc	Points
40	Prerequisite
50	1
60	2
70	3
80	4
90	5
100	6

[20] Refer to Human Experience category on Arc for Quality of Life.
[21] Daily AQI must be based on hourly monitoring of all five major air pollutants - ground-level ozone, PM 2.5, PM 10, carbon monoxide, sulfur dioxide, and nitrogen dioxide.
[22] The Violent Crime Rate is an aggregate per capita measure of the number of homicides (murder and non-negligent manslaughter), forcible rape, robberies, and aggravated assault crimes. Violent Crime is defined differently based on national standards. Therefore, consider the data requested and disaggregate local values as needed to reflect the LEED for Cities' definition.

QL CREDIT: TREND IMPROVEMENTS

1-4 Points

This credit applies to

- Cities
- Communities

Intent

To demonstrate an improvement over time in key metrics pertaining to a person's quality of life.

Requirements

CITIES, COMMUNITIES

Select up to four (4) of the following metrics and demonstrate either an annual improving trend from a baseline year no more than five years prior to the most recent reporting year or achievement of the stated thresholds. One point is available for each metric demonstrating improvement.

- **Population with a High School Degree** – Portion of population aged 25 years and over who have obtained a high school diploma[23]; Threshold: Equal to or greater than 70%
- **Graduation Rate** – Portion of school district's initial cohort class graduating from high school (or ISCED level 3)[24]; Threshold: Equal to or greater than 90%
- **Small Businesses** – Number of businesses having fewer than 500 employees per 1,000 residents[25]; Threshold: Equal to or greater than 20
- **Unemployment Rate** – Portion of population in the labor market who are not employed[26]; Threshold: Between 3 to 4 percent
- **Poverty Rate** – Portion of population living below the national poverty line[27]; Threshold: Declining at a rate of zero poverty by 2025
- **Percentage of household incomes meeting the living wage standard** – Portion of households meeting the living wage for the area[28]; Threshold: Equal to or greater than 80%
- **Violent Crime** – Incidents of violent crime, weighted by type, per 100,000 people[29]; Thresholds: Equal to or less than 5.5 homicides, 70 incidents of forcible rape, and 462.7 aggravated assaults.
- **Asthma rate** – Portion of the population aged 18 years and over who have current asthma prevalence; Threshold: None, trend decreasing only
- **Hypertension** – Portion of the population aged 18 years and over with high blood pressure[30]; Threshold: Non, trend decreasing only
- **Obesity rate** – Portion of the population aged 18 years and over who have a body mass index (BMI) greater than or equal to 30.0 kg/m^2 [31]; Threshold: Equal to or less than 26%

[23] High school degree may include equivalency, such as GED or other certificate of completion
[24] Graduation Rate is the percentage of a school's first-time cohort who completes their program within the published time for the program. The International Standard Classification of Education (ISCED) provides a standard for international comparison of education statistics. A high school degree is equivalent to ISCED level 3. Reference: STAR v2 EAC-3 Educational
[25] Reference: STAR v2 EJ-3 Local Economy Outcome 3
[26] Reference: variation on STAR v2 EJ-1 Business Retention & Development Outcome 2
[27] Reference: STAR v2 EE-6 Poverty Prevention & Alleviation Outcome 1
[28] Consider costs for food, childcare, heath, housing, transportation, other necessities and taxes to calculate the living wages. Minimum living wage must be calculated individually for the main family compositions found within the city. Take a weighted average of the living wages to calculate the average minimum living wage for the city. Based on income data, identify the percentage of population meeting the minimum living wage requirement. http://livingwage.mit.edu/resources/Living-Wage-User-Guide-and-Technical-Notes-2017.pdf Reference: STAR v2 EJ-4 Quality Jobs & Living Wages Outcome 2
[29] Violent Crime Rate includes the number of homicides (murder and non-negligent manslaughter), forcible rape, robberies, and aggravated assault crimes. Violent Crime is defined differently based on national standards. Therefore, disaggregate local values as needed to reflect this definition. Incidents should include all reportable offenses in the given area, even if not under the local authority's jurisdiction. Reference: variation on STAR v2 HS-7 Safe Communities Outcome 1
[30] This metric may also be reported as "Poor or fair health". Reference: variation on HS-2 Community Health Outcome 1
[31] Reference: variation on HS-2 Community Health Outcome 2

QL CREDIT: DISTRIBUTIONAL EQUITY

4 Points

This credit applies to

- Cities
- Communities

Intent

To foster equitable economic prosperity and expand access to community services to all.

Requirements

CITIES, COMMUNITIES

Option 1. Equitable Per Capita Income (1 point)
Demonstrate the median earnings of males and females is not less than 5 percentage points of the total median earnings and that the disparity of income per capita amongst identified sociocultural groups is not greater than 5 percentage points.

Reference:
Variation on STAR v2 EE-6 Poverty Prevention & Alleviation Outcome 2

AND/OR

Option 2.

Equitable Workforce Mobility (1 point)
Demonstrate that the post-secondary educational attainment of the population aged 25 and older in the subcategories of male, female, and identified sociocultural groups is not less than 5 percentage points of the overall post-secondary educational attainment. Post-secondary educational attainment includes high-quality credentials and associate, bachelor, and graduate/professional degrees.

Reference:
STAR v2 EJ-6 Workforce Readiness Outcome 3

OR

Graduation Rate Equity (1 point)
Demonstrate that the high school graduation rate (or ISCED level 3) for the subcategories of male, female, and identified sociocultural groups is not less than 5 percentage points of the overall graduation rate for the district.

Reference:
STAR v2 EAC-3 Educational Opportunity & Attainment Outcome 4

AND/OR

Option 3. Equitable Employment (1 point)
Demonstrate that the unemployment rate for the subcategories of male, female, and identified sociocultural groups is not less than 5 percentage points of the overall unemployment rate.

Reference:
STAR v2 EJ-1: Business Retention & Development Outcome 3

AND/OR

Option 4. Access & Proximity (1 point)

Demonstrate that community facilities, such as parks, libraries, recreation centers, and schools, and healthful retail food outlets are as accessible to low-income residents as they are to the broader community. Density is based on the number of dwelling units per acre. Use Network Analyst to identify walkability routes and the density category to select the appropriate walk distance requirement for the buffered area.

Table 12. Points for Access and Proximity

Dwelling Units per Acre	Density Category	Walk Distance Requirement
12+	High	¼ mile (400 meters)
7-11	Intermediate	¾ mile (1200 meters)
<7	Intermediate-low or Low	1 mile (1600 meters)

Reference:
STAR v2 EE-4 Equitable Services & Access Outcome 1

QL CREDIT: ENVIRONMENTAL JUSTICE

1 Point

The credit applies to

- Cities
- Communities

Intent

To address conditions that may lead to neighborhoods or populations being overburdened by environmental pollutants.

Requirements

CITIES, COMMUNITIES

Demonstrate progress in reducing the risks and exposure to priority environmental justice conditions for priority areas in the last 5 years.

- Identify the priority environmental justice conditions.
  Priority environmental justice conditions are considered when a specific section of the community such as women and/or children, low-income groups, specific neighborhoods or sociocultural groups experience a disproportionate amount of human health or environmental effect, such as:
  - Bodily impairment, infirmity, illness or death
  - Air, noise, and water pollution and soil contamination
  - Destruction or disruption of man-made or natural resources
  - Destruction or disruption of community cohesion or a community's economic vitality
  - Destruction or disruption of the availability of public and private facilities and services
  - Displacement of persons, businesses, farms, or nonprofit organizations
  - Isolation, exclusion, or separation from the broader community

The scope of environmental justice includes not only the disparate impacts from degradation to the natural environment, but impacts to the general environment that people live and work in as well.

- Identify the priority areas.
  Priority areas must be identified based on evaluating the following:
  - Sections with the highest percentage of historically overburdened populations
  - Areas known to have the highest concentration of environmental pollutants or polluters
  - Areas identified through substantial community engagement or complaints surrounding environmental justice conditions
  - Areas currently in violation of state environmental regulations or where violations have been resolved within the last 3 years

Reference:
STAR v2 EE-3: Environmental Justice

QL CREDIT: HOUSING AND TRANSPORTATION AFFORDABILITY

1-2 Points

This credit applies to

- Cities
- Communities

Intent

To provide an adequate and diverse supply of location-efficient and affordable housing options for all.

Requirements

CITIES, COMMUNITIES

Demonstrate the delivery of high quality homelessness services related to short-term emergency shelter options and permanent housing solutions in coordination with non-governmental service providers.

Reference:
Adaptation on STAR v2 EE-5 Human Services Outcome 1 and Action 8

AND

Option 1. Adopt a comprehensive housing policy that addresses the following elements (1 point)

- Higher density (12 DU per acre) within ¼ mile (400 meters) of walking distance to public transit stations;
- A housing needs assessment addressing housing supply affordability, diversity of housing stock by unit and ownership type, and community demographics;
- Programs or code enforcement ensuring healthy housing standards for both rental and owner-occupied units; and
- Evaluation of existing area conditions to identify whether a family of four with an income at 200% national poverty level could afford to live with less than 45% housing plus transportation costs or zoning ordinances requiring at least 10% of units are affordable in transit-served areas and areas identified for compact, mixed-use development.

References:
Adaptation on STAR v2 BE-3 Compact & Complete Communities Action 4
BE-4 Housing Affordability Actions 1 & 2
HS-2 Community Health Action 5

AND/OR

Option 2. Demonstrate that at least 60% of households, compared to the National Typical, would spend less than 45% on housing and transportation combined. (1 point)

Reference:
Adaptation on STAR v2 BE-4 Housing Affordability Outcome 1

QL CREDIT: CIVIC AND COMMUNITY ENGAGEMENT

1-2 Points

This credit applies to

- Cities
- Communities

Intent

To promote a cohesive, and socially connected community and facilitate their participation in local decision-making.

Requirements

CITIES, COMMUNITIES

Demonstrate both high-tech and high-touch on-going engagement techniques that empower the public in shaping the future of the community.

AND

Demonstrate that public engagement techniques include practices that intentionally and directly engage all residents, including traditionally unrepresented or underrepresented groups, through inclusive, context-sensitive, and transparent decision-making processes.

Reference:
STAR v2 IP-1 Best Practices & Processes (2)

AND

Attempt any of the following options for a maximum of 2 points:

Option 1. Demonstrate that appointments to local advisory boards and commissions reflect the gender, racial, and ethnic diversity of the area. (1 point)

Reference:
STAR v2 EE-1 Civic Engagement Outcome 3

AND/OR

Option 2. Demonstrate that 51% or more of residents believe they are able to have a positive impact on their community based on a local survey. (1 point)

Reference:
STAR v2 EE-1 Civic Engagement Outcome 2

AND/OR

Option 3. Demonstrate that at least 80% of residents report positive levels of neighborhood cohesion based on a local survey. (1 point)

Reference:
STAR v2 EAC-2 Community Cohesion Outcome 3

AND/OR

Option 4. Demonstrate that at least 30% of residents in large jurisdictions or 35% of residents in small or mid-sized jurisdictions volunteered in the past year. (1 point)

Reference:
STAR v2 EAC-2 Community Cohesion Outcome 2

QL CREDIT: CIVIL AND HUMAN RIGHTS

1 Point

This credit applies to

- Cities
- Communities

Intent

To uphold a process that ensures the civil and human rights of all people is fundamental

Requirements

CITIES, COMMUNITIES[32]

- Adopt a policy-based mission statement to promote a discrimination free quality of life for all relating to employment, housing, and public accommodations on the basis of race, sex, color, religion, national origin, disability, age, sexual orientation, marital status or familial status and gender identity or expression.

Reference:
STAR v2 EE-2 Civil & Human Rights Action 2

- Describe initiatives and policies that ensure the voting rights of all eligible voters are protected.
- Integrate community policing and procedural justice into police department operations to support and build trust with residents.

Reference:
STAR v2 HS-7 Safe Communities Action 7

- Have in place a local officer or Commission on Human Rights who is responsible for:
  - formulating and carrying out educational programs designed to minimize or eliminate discriminatory practices;
  - receiving and investigating complaints alleging any discriminatory practices by police or non-police;
  - providing mediation services to resolve incidences of alleged discriminatory practices; and
  - publishing an annual report detailing any issues, complaints, and other activities;
  - advising leadership on human rights issues.

Reference:
Adaptation of STAR v2 EE-2 Civil & Human Rights Actions 3 and 5

[32] Communities may include city level officers accessible to the community residents to demonstrate achievement of this credit.

INNOVATION (IN)

IN CREDIT: INNOVATION

1-6 Points

This credit applies to

- Cities
- Communities

Intent

To encourage cities to achieve exceptional or innovative performance.

Requirements

CITIES, COMMUNITIES

One point is awarded for each Innovation credit achieved, up to a maximum of six. A city or community may use any combination of the options below. Each option is equivalent to one point.

Option 1. Achieve significant, measurable environmental performance using a strategy not addressed in the LEED for Cities and Communities rating system.

Identify all of the following:

- Intent of the proposed innovation credit
- Proposed requirements for compliance
- Proposed submittals to demonstrate compliance
- Design approach or strategies used to meet the requirements.

AND / OR

Option 2. Achieve exemplary performance in any of the LEED for Cities and Communities prerequisite or credit. An exemplary performance point is typically earned for achieving double the credit requirements or the next incremental percentage threshold.

AND / OR

Option 3. Meet all of the requirements of a prerequisite or credit from any of the below rating systems at the city or utility level:

- STAR Community Rating System v2, October 2016
- PEER Rating System v2, February 2018
- LEED v4 Transit, November 2018

REGIONAL PRIORITY (RP)

RP CREDIT: REGIONAL PRIORITY

1-4 Points

This credit applies to

- Cities
- Communities

Intent

To provide an incentive for the achievement of credits that address geographically specific socio-economic and environmental priorities.

Requirements

CITIES, COMMUNITIES

Option 1. One point is awarded for each Regional Priority credit achieved, up to a maximum of four.

- Identify the credit which is a regional priority.
- Provide Background and context outlining the regional priority.
- Achieve the full points for respective LEED for Cities and Communities credit.

AND/OR

Option 2. Achieve significant, measurable environmental performance for a regional priority using a strategy not addressed in the LEED for Cities and Communities rating system.

Identify all of the following:

- Intent of the proposed regional priority credit
- Provide Background and context outlining the regional priority.
- Proposed requirements for compliance
- Proposed submittals to demonstrate compliance
- Design approach or strategies used to meet the requirements.

Appendices

APPENDIX 1. DIVERSE USES

List of Diverse uses

Category	Use type
Food retail	Supermarket
	Grocery with produce section
Community-serving retail	Convenience store
	Farmers market
	Hardware store
	Pharmacy
	Other retail
Services	Bank
	Family entertainment venue (e.g., theater, sports)
	Gym, health club, exercise studio
	Hair care
	Laundry, dry cleaner
	Restaurant, café, diner (excluding those with only drive-thru service)
Civic and community facilities	Adult or senior care (licensed)
	Child care (licensed)
	Community or recreation center
	Cultural arts facility (museum, performing arts)
	Education facility (e.g., K—12 school, university, adult education center, vocational school, community college)
	Government office that serves public on-site
	Medical clinic or office that treats patients
	Place of worship
	Police or fire station
	Post office
	Public library
	Public park
	Social services center
	Open community spaces such as squares and plazas

APPENDIX 2. LT CREDIT: INTERMODAL CONNECTIVITY AND PLACEMAKING
(LEED v4 BD+C TRANSIT)

1–4 points

Intent
To encourage development in locations shown to have multimodal transportation choices or otherwise reduced motor vehicle use, thereby reducing greenhouse gas emissions, air pollution, and other environmental and public health harms associated with motor vehicle use.

Requirements
Option 1. Transit for Placemaking
Ensure that the station displays characteristics that will integrate a mixture of uses to connect people and places and maximize utilization (1-3 points)

- Walkable Streets
- Compact Development
- Public Spaces and Cultural Opportunities
- Mixed Use

Table 1. Points for Placemaking Characteristics

Number of placemaking characteristics displayed by station	Points
1-characteristics	1
2-characteristics	2
3-characteristics	3
4-characteristics	4

AND/OR

Option 2. Transit for People-moving: Intermodal Connections (1-4 points)
Ensure that the station is connected to three or more other modes of transportation and includes at least 3 of 8 of the following intermodal connectivity features:

- Three or more bus routes at station
- Minimum of four short-term bicycle storage spaces at station
- Minimum two long-term bicycle storage spaces or valet at station or policies to allow bicycles on transit systems
- Vehicle parking at station with carpool services provided
- Airport within one connection and total transit travel time of less than 1.5 hours
- Regional or commuter rail within one connection and total transit travel time of less than 1 hour
- Ferry within one connection
- Designated passenger drop off area

Table 2. Points for intermodal connections

Number of modal connections offered at station	Points
3 connections	1
4 connections	2
5 connections	3
6+ connections	4