

## LEED Building Design and Construction

### Activity #3 –Location and Transportation (LT)

Before completing this Activity Read: Reference Guide for Building Design and Construction v4 – Pages 54-135

Note the following abbreviations are used in this activity:

NC	LEED BD+C: New Construction and Major Renovation
CS	LEED BD+C: Core and Shell Development
S	LEED BD+C: Schools
R	LEED BD+C: Retail
DC	LEED BD+C: Data Centers
WDC	LEED BD+C: Warehouses and Distribution Centers
HOS	LEED BD+C: Hospitality
HC	LEED BD+C: Healthcare

Although the LEED BD+C reference guide does not number the LEED prerequisites and credits, for this exercise they have been numbered in the order presented in the credit category.

#### Fill-In, Multiple Choice, Matching

1. Test your knowledge of how well you know the names of the credits for the Location and Transportation (LT) credit category:

Credit	Name
C1	LEED for Neighborhood Development Location
C2	Sensitive Land Protection
C3	High Priority site
C4	Surrounding Density and Diverse Uses
C5	Access to Quality Transit
C6	Bicycle Facilities
C7	Reduced Parking Footprint
C8	Green Vehicles

2. Match the intent shown below to the prerequisite or credit:

Credit	ANS
LT – C1	D
LT – C2	A
LT – C3	F
LT – C4	B
LT – C5	H
LT – C6	C
LT – C7	E
LT – C8	G

	INTENT
A	To avoid the development of environmentally sensitive lands and reduce the environmental impact from the location of a building on a site.
B	To conserve land and protect farmland and wildlife habitat by encouraging development in areas with existing infrastructure. To promote walkability, and transportation efficiency and reduce vehicle distance traveled. To improve public health by encouraging daily physical activity.
C	To promote bicycling and transportation efficiency and reduce vehicle distance traveled. To improve public health by encouraging utilitarian and recreational physical activity.
D	To avoid development on inappropriate sites. To reduce vehicle distance traveled. To enhance livability and improve human health by encouraging daily physical activity.
E	To minimize the environmental harms associated with parking facilities, including automobile dependence, land consumption, and rainwater runoff.
F	To encourage project location in areas with development constraints and promote the health of the surrounding area.
G	To reduce pollution by promoting alternatives to conventionally fueled automobiles.
H	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.

3. List examples of existing infrastructure that well-located buildings could take advantage of:
  1. public transit
  2. street networks
  3. pedestrian paths
  4. bicycle networks
  5. services and amenities
  6. existing utilities - electricity, water, gas, and sewage
  
4. List alternatives to private automobile use encouraged by the Location and transportation (LT) credit category:
  1. walking
  2. biking
  3. vehicle shares
  4. public transit
  
5. Reusing previously developed land, cleaning up brown field sites, and investing in disadvantaged areas conserve undeveloped land and ensure efficient delivery of services and infrastructure.
  
6. Measuring walking and bicycling distances by how far a pedestrian and bicyclist would travel from a point of origin to a destination is known as the shortest path analysis.
  
7. List examples of infrastructure that makes a walking path safe and comfortable for pedestrians:
  1. sidewalks
  2. all-weather-surfaces footpaths
  3. crosswalks
  4. equivalent pedestrian facilities

8. List examples of infrastructure that makes bicycling safe and comfortable for bicyclists:
1. on-street bicycle lanes
  2. off-street bicycle paths or trails
  3. streets with low target vehicle speeds
9. When determining total parking capacity, include all the off-street spaces available to the project building's users. This may include spaces both inside and outside the project boundary.
10. List the parking spaces that must be included when determining a projects total parking capacity:
1. New and existing surface parking spaces
  2. New and existing garage or multilevel parking spaces
  3. Any off-street parking spaces outside the project boundary that are available to the building's users.
11. List the parking spaces that should not be included when determining a projects total parking capacity:
1. On-street (parallel or pull-in) parking spaces on public rights of way
  2. Parking spaces for fleet and inventory vehicles, unless these vehicles are regularly used by employees for commuting as well as business purposes.
  3. Motorbike or bicycle spaces
12. Preferred parking spaces have the shortest walking distance to the main entrance of the project, exclusive of spaces designated for people with disabilities.
13. Although not encouraged, preferred parking areas and signage for carpool and vanpool vehicles and green vehicles may be combined if 10% of total parking capacity is reserved with this signage and both Reduced Parking Footprint and Green Vehicles credits are achieved.
14. LT Credit LEED for Neighborhood Development Location Requirements  
 Locate the project within the boundary of a development certified under LEED for Neighborhood Development (Stage 2 or Stage 3 under the Pilot or 2009 rating systems, Certified Plan or Certified Project under the LEED v4 rating system).
- Projects attempting this credit are not eligible to earn points under other Location and Transportation credits.

15. Complete Table 1. Points for LEED ND location:

Table 1. Points for LEED ND location				
Certification Level	Points BD+C (NC, R, DC, WDC, HOS)	Points BD+C (CS)	Points BD+C (S)	Points BD+C (HC)
Certified	8	8	8	5
Silver	10	12	10	6
Gold	12	16	12	7
Platinum	16	20	15	9

16. The LEED for Neighborhood Development (LEED ND) rating system combines principles of smart growth, new urbanism, and green building design and construction to promote sustainable, healthy, and equitable places for neighborhood residents, workers, and visitors.

17. List sustainability features found in LEED for Neighborhood Development (LEED ND) neighborhoods:

1. walkability
2. Transit Access
3. Sensitive Land Protection
4. Connectivity
5. Shared Infrastructure

18. List where a project team could find up-to-date lists of LEED ND projects or soon-to-be-certified LEED ND neighborhoods:

1. USGBC website
2. Local USGBC chapters

19. Complete Table 2. Eligibility by LEED ND certification designation:

Version	Eligible	Ineligible
LEED ND Pilot	Stage 2 LEED ND Certified Plan Stage 3 LEED ND Certified Project	Stage 1 LEED ND Pre-Reviewed Plan
LEED 2009	Stage 2 Pre-certified LEED ND Plan Stage 3 LEED ND Certified Neighborhood Development	Stage 1 Conditional Approval of LEED ND Plan
LEED v4	LEED ND Certified Plan LEED ND Certified Built Project	LEED ND Conditional Approval

20. The LEED ND project must have achieved certification to earn this credit. LEED ND projects that have only been registered or submitted for certification review do not qualify.

21. List the information that must be obtained from the LEED ND project team:

1. Project name and ID number
2. map of certified LEED ND Neighborhood or plan boundary.

22. List the required documentation for the LT Credit LEED for Neighborhood Development Location:

1. LEED ND project information (name, ID number, rating system and version, certification level, and certification date).
2. Vicinity base map with LEED project boundary and LEED ND certified neighborhood or plan boundary.

23. LT Credit Sensitive Land Protection requirements:

OPTION 1.

Locate the development footprint on land that has been previously developed.

Or

OPTION 2.

Locate the development footprint on land that has been previously developed or that does not meet the following criteria for sensitive land:

1. Prime Farmland
2. Floodplains
3. Habitat
4. Water Bodies (100 feet)
5. Wetlands (50 feet)

Minor improvements within the wetland and water body buffers may be undertaken to enhance appreciation of them, provided such facilities are open to all building users.

Only the following improvements are considered minor:

Bicycle and pedestrian pathways no more than 12 feet wide (3.5 meters), of which no more than 8 feet (2.5 meters) may be impervious;

Activities to maintain or restore native natural communities and/or natural hydrology;

One single-story structure per 300 linear feet (90 linear meters) on average, not exceeding 500 square feet (45 square meters);

Grade changes necessary to ensure public access;

Clearings, limited to one per 300 linear feet (90 linear meters) on average, not exceeding 500 square feet (45 square meters) each;

Removal of the following tree types:

Hazardous trees, up to 75% of dead trees

Trees less than 6 inches (150 millimeters) diameter at breast height

Up to 20% of trees more than 6 inches (150 millimeters) diameter at breast height with a condition rating of 40% or higher.

Trees under 40% condition rating

The condition rating must be based on an assessment by an arborist certified by the International Society of Arboriculture (ISA) using ISA standard measures, or local equivalent for projects outside the U.S.

Brownfield remediation activities.

24. One strategy for lessening the environmental consequences of a building is to select a site that has previously been developed and then to limit the building's footprint to the previously developed area.

25. List the options for LT Credit High Priority Site and complete the requirements:

OPTION 1. HISTORIC DISTRICT

Locate the project on an infill location in a historic district.

OR

OPTION 2. Priority Designation

Locate the project on one of the following:

- a site listed by the EPA National Priorities List;
- a Federal Empowerment Zone site;
- a Federal Enterprise Community site;
- a Federal Renewal Community site;
- 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 Federal level for projects outside the U.S.

OR

OPTION 3. Brownfield Remediation

Locate on a brownfield where soil or groundwater contamination has been identified, and where the local, state, or national authority (whichever has jurisdiction) requires its remediation. Perform remediation to the satisfaction of that authority.

- 26. The redevelopment of sites in historic districts can also reduce urban sprawl through adaptive reuse.
- 27. To determine infill status, first identify all land within 1/2 mile (800 meters) of the project boundary that has been previously developed, excluding streets and other rights of way.
- 28. Determine the percentage of land that is previously developed by dividing the previously developed area by the total land area less streets and rights-of-way within 1/2 mile (800 meters) of the project boundary. Water bodies are not included in land area. If this percentage is 75% or greater, the location is considered an infill site.
- 29. For LT Credit High Priority Site exemplary performance, pursue Option 2 or 3 in addition to Option 1. Otherwise, only one option is allowed.
- 30. LT Credit Surrounding Density and Diverse Uses requires:  
NC, CS, S, R, DC, HOS  
OPTION 1 – Surrounding Density  
Locate on a site whose surrounding existing density within a 1/4 mile (400-meter) radius of the project boundary meets the values in Table 1. Use either the “separate residential and nonresidential densities” or the “combined density” values.

Complete Table 1A. Points for average density within 1/4 mile of project (imperial units)

Table 1A. Points for average density within 1/4 mile of project (imperial units)				
Combined Density	Separate Residential and Nonresidential Densities		Points BD+C (except Core and Shell)	Points BD+C (Core and Shell)
	Square feet per acre of buildable land	Residential Density (DU/acre)		
	22,000	7	0.5	2
	35,000	12	0.8	4

### Schools Only

School projects earning LT Credit Surrounding Density and Diverse Uses following OPTION 1. Surrounding Density may exclude what types of spaces from the development density calculations?

1. Playing fields and associated buildings used during sporting events only
2. Playgrounds with play equipment

AND/OR

### OPTION 2. Diverse Uses

Construct or renovate a building or a space within a building such that the building's main entrance is within a 1/2 mile (800-meter) walking distance of the main entrance of four to seven (1 point) or eight or more (2 points) existing and publicly available diverse uses (listed in Appendix 1). The following restrictions apply.

A use counts as only one 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 walking distance, only two may be counted).

The counted uses must represent at least three of the five categories, exclusive of the building's primary use.

### Warehouses and Distribution Centers

#### OPTION 1. Development and Adjacency

Construct or renovate the project on a previously developed site that was used for industrial or commercial purposes (2 points).

OR

Construct or renovate the project on a site that is both a previously developed and an adjacent site. The adjacent sites must be currently used for industrial or commercial purposes (3 points).

AND/OR

#### OPTION 2. Transportation Resources

Construct or renovate the project on a site that has two or three (1 point) or four (2 points) of the following transportation resources:

The site is within a 10-mile (16 kilometer) driving distance of a main logistics hub, defined as an airport, seaport, intermodal facility, or freight village with intermodal transportation.

The site is within a 1-mile (1 600-meter) driving distance of an on-off ramp to a highway.

The site is within a 1-mile (1 600-meter) driving distance of an access point to an active freight rail line.

The site is served by an active freight rail spur.

In all cases, a planned transportation resource must be sited, funded, and under construction by the date of the certificate of occupancy and complete within 24 months of that date.

Healthcare

OPTION 1. Surrounding Density

Locate on a site whose surrounding existing density within a 1/4 mile (400-meter) radius of the project boundary is:

1. At least 7 dwelling units per acre (17.5 DU per hectare) with a 0.5 floor-area ratio. The counted density must be existing density, not zoned density, or
2. At least 22,000 square feet per acre (5050 square meters per hectare) of buildable land.

For previously developed existing rural healthcare campus sites, achieve a minimum development density of 30,000 square feet per acre (6 890 square meters per hectare).

OR

OPTION 2. Diverse Uses

Construct or renovate a building on a site such that the building's main entrance is within a 1/2 mile (800-meter) walking distance of the main entrance of at least seven operational and publicly accessible uses (listed in Appendix 1).

The following restrictions apply.

A use counts as only one 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 walking distance, only two may be counted).

The counted uses must represent at least three of the five categories, exclusive of the building's primary use.

31. Because most people prefer to walk no more than a quarter of a mile (400 meters) or five minutes to casual destinations and no more than half a mile (800 meters) for regular trips such as a daily commute, locating different kinds of destinations close to each other achieves a long list of documented environmental and social benefits.
32. List the categories for uses types:
  1. Food Retail
  2. Community - serving retail
  3. Services
  4. civic and Community facilities
  5. Community anchor uses (B0tc and IDtc only)
33. To be considered a previously developed site, the land area must be 75% previously developed
34. LT Credit Access to Quality Transit requirements:  
NC, CS, DC, WDC, HOS  
Locate any functional entry of the project within a 1/4 mile (400-meter) walking distance of existing or planned bvs, streetcar, or rideshare stops, or within a 1/2-mile (800-meter) walking distance of existing or planned bvs rapid transit stops, light or heavy rail stations, Commuter Rail stations, or commuter ferry terminals. The transit service at those stops and stations in aggregate must meet the minimums listed in Tables 1 and 2. Planned stops and stations may count if they are sited, funded



and under construction by the date of the certificate of occupancy and are complete within 24 months of that date.

Both weekday and weekend trip minimums must be met.

Qualifying transit routes must have paired route service (service in opposite directions).

For each qualifying transit route, only trips in one direction 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.

Complete Table 1. Minimum daily transit service for projects with multiple transit types (bus, streetcar, rail, or ferry)

Weekday Trips	Weekend Trips	Points BD+C (except Core and Shell)	Points BD+C (Core and Shell)
72	40	1	1
144	108	3	3
360	216	5	6

Complete Table 2. Minimum daily transit service for projects with commuter rail or ferry service only

Weekday Trips	Weekend Trips	Points (All Projects)
24	6	1
40	8	2
60	12	3

Projects served by two or more transit routes such that no one route provides more than 60% of the documented levels may earn one additional point, up to the maximum number of points.

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.

#### Schools

##### OPTION 1. Transit-Served Location (1-4 points)

Locate any functional entry of the project within a 1/4-mile (400-meter) walking distance of existing or planned bus, streetcar, or rideshare stops, or within a 1/2-mile (800-meter) walking distance of existing or planned bus rapid transit stops, light or heavy rail stations, commuter rail stations, or commuter ferry terminals. The transit service at those stops and stations in aggregate must meet the minimums listed in Tables 1 and 2. Planned stops and stations may count if they are sited, funded, and under construction by the date of the certificate of occupancy and are complete within 24 months of that date.

Qualifying transit routes must have paired route service (service in opposite directions).

For each qualifying transit route, only trips in one direction 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.

Complete Table 1. Minimum daily transit service for projects with multiple transit types (bus, streetcar, rail, or ferry)

Table 1. Minimum daily transit service for projects with multiple transit types (bus, streetcar, rail, or ferry)	
Weekday Trips	Points
72	1
144	2
360	4

Complete Table 2. Minimum daily transit service for projects with commuter rail or ferry service only

Table 2. Minimum daily transit service for projects with commuter rail or ferry service only	
Weekday Trips	Points
24	1
40	2
60	3

Projects served by two or more transit routes such that no one route provides more than 60% of the prescribed levels may earn one additional point, up to the maximum number of points.

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.

OR

OPTION 2. Pedestrian Access

Show that the project has an attendance boundary such that the specified percentages of students live within no more than a 3/4-mile (1200-meter) walking distance (for grades 8 and below, or ages 14 and below), and 1 1/2-mile (2400-meter) walking distance (for grades 9 and above or ages 15 and above) of a functional entry of a school building. Points are awarded according to Table 3.

Complete Table 3. Points for student population within walking distance

Table 3. Points for student population within walking distance	
Percentage of Students	Points
50%	1
60%	2
70% or more	4

In addition, locate the project on a site that allows pedestrian access to the site from all residential neighborhoods that house the planned student population.

Healthcare

Locate any functional entry of the project within a 1/4-mile (400-meter) walking distance of existing or planned bvs, streetcar, or rideshare stops, or within a 1/2-mile (800-meter) walking distance of existing or planned bvs rapid transit stops, light or heavy rail stations, commuter rail stations, or commuter ferry terminals. The transit service at those stops and stations in aggregate must meet the minimums listed in Tables 1 and 2. Planned stops and stations may count if they are sited, funded, and under construction by the date of the certificate of occupancy and are complete within 24 months of that date.

Both weekday and weekend trip minimums must be met.

Qualifying transit routes must have paired route service (service in opposite directions).

For each qualifying transit route, only trips in one direction 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.

Complete Table 1. Minimum daily transit service for projects with multiple transit types (bus, streetcar, rail, or ferry)

Weekday Trips	Weekend Trips	Points
72	40	1
144	108	2

Complete Table 2. Minimum daily transit service for projects with commuter rail or ferry service only

Weekday Trips	Weekend Trips	Points
24	6	1
40	8	2

Projects served by two or more transit routes such that no one route provides more than 60% of the documented levels may earn one additional point, up to the maximum number of points.

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.

35. Nearly all forms of public transit create fewer greenhouse gas emissions per passenger than single-occupancy vehicles.
36. To earn exemplary performance for LT Credit Access to Quality Transit double the highest transit service point threshold (except for Schools projects using Option 2).
37. LT Credit Bicycle Facilities requirements:  
 NC, CS, DC, WDC, HOS  
 Bicycle Network  
 Design or locate the project such that a functional entry and/or bicycle storage is within a 200-yard (180-meter) walking distance or bicycling distance from a bicycle network that connects to at least one of the following:

at least 10 diverse uses (see Appendix 1);

a school or employment center, if the project total floor area is 50% or more residential; or

a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

#### Bicycle Storage and Shower Rooms

##### Case 1. Commercial or Institutional Projects

Provide short-term bicycle storage for at least 2.5% of all peak visitors, but no fewer than four storage spaces per building.

Provide long-term bicycle storage for at least 5% of all regular building occupants, but no fewer than four storage spaces per building in addition to the short-term bicycle storage spaces.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building occupants thereafter.

##### Case 2. Residential Projects

Provide short-term bicycle storage for at least 2.5% of all peak visitors but no fewer than four storage spaces per building.

Provide long-term bicycle storage for at least 30% of all regular building occupants, but no less than one storage space per residential unit.

##### Case 3. Mixed-Use Projects

Meet the Case 1 and Case 2 storage requirements for the nonresidential and residential portions of the project, respectively.

#### For all Projects

Short-term bicycle storage must be within 100-feet (30 meters) walking distance of any main entrance. Long-term bicycle storage must be within 100-feet (30 meters) walking distance of any functional entry.

Bicycle storage capacity may not be double-counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

Core and shell projects should refer to Appendix 2, Default Occupancy Counts, for occupancy count requirements and guidance.

#### School

##### Bicycle Network

Design or locate the project such that a functional entry and/or bicycle storage is within a 200-yard (180-meter) walking distance or bicycling distance of a bicycle network that connects to at least one of the following:

at least 10 diverse uses (see Appendix 1); or

a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Provide dedicated bicycle lanes that extend at least to the end of the school property with no barriers (e.g., fences) on school property.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

#### Bicycle Storage and Shower Rooms

Provide long-term bicycle storage for at least 5% of all regular building occupants (excluding students grade 3 and younger), but no fewer than four storage spaces per building.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants (excluding students) and one additional shower for every 150 regular building occupants (excluding students) thereafter.

Long-term storage spaces must be easily accessible to occupants and be within 100 feet (30 meters) walking distance of any main entrance. Bicycle storage capacity may not be double-counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

#### Retail

##### Bicycle Network

Design or locate the project such that a functional entry and/or bicycle storage is within a 200-yard (180-meter) walking distance or bicycling distance from a bicycle network that connects to at least one of the following:

at least 10 diverse uses (see Appendix 1);

a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

#### Bicycle Storage and Shower Rooms

Provide at least two short-term bicycle storage spaces for every 5,000 square feet (465 square meters), but no fewer than two storage spaces per building.

Provide long-term bicycle storage for at least 5% of regular building occupants, but no fewer than two storage spaces per building in addition to the short-term bicycle storage spaces.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building occupants thereafter.

Short-term bicycle storage must be within 100-feet (30 meters) walking distance of any main entrance.

Long-term bicycle storage must be within 100-feet (30 meters) walking distance of any functional entry.

Bicycle storage capacity may not be double-counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

Provide a bicycle maintenance program for employees or bicycle route assistance for employees and customers.

Route assistance must be provided in a manner easily accessible to both employees and customers.

For projects that are part of a multi tenant complex only: If bicycle storage spaces have been provided in the complex in which the project is located, determine the number of spaces that may be attributed to the project by dividing the project's floor area by the total floor area of the development (buildings only) and multiplying the percentage result by the total number of spaces. If this number does not meet the credit requirement, the project must provide additional bicycle storage.

## Healthcare

### Bicycle Network

Design or locate the project such that a functional entry and/or bicycle storage is within a 200-yard (180-meter) walking distance or bicycling distance from a bicycle network that connects to at least one of the following:

at least 10 diverse uses (see Appendix 1);

a bus rapid transit stop, light or heavy rail station, commuter rail station, or ferry terminal.

All destinations must be within a 3-mile (4800-meter) bicycling distance of the project boundary.

Planned bicycle trails or lanes may be counted if they are fully funded by the date of the certificate of occupancy and are scheduled for completion within one year of that date.

### Bicycle Storage and Shower Rooms

#### Case 1. Commercial or Institutional Projects

Provide short-term bicycle storage for at least 2.5% of all peak visitors, but no fewer than four storage spaces per building.

Provide long-term bicycle storage for at least 5% of regular building occupants (excluding patients), but no fewer than four storage spaces per building in addition to the short-term bicycle storage spaces.

Provide at least one on-site shower with changing facility for the first 100 regular building occupants (excluding patients) and one additional shower for every 150 regular building occupants thereafter.

#### Case 2. Residential Projects

Provide secure, enclosed bicycle storage for at least 30% of all regular building occupants (excluding patients) measured at peak periods, but no less than one storage space per residential unit.

#### For all Projects

Short-term bicycle storage must be within 100-feet (30 meters) walking distance of any main entrance. Long-term bicycle storage must be within 100-feet (30 meters) walking distance of any functional entry.

Bicycle storage capacity may not be double-counted: storage that is fully allocated to the occupants of nonproject facilities cannot also serve project occupants.

Bicycling offers many individual and global benefits. For every mile (1600 meters) pedaled rather than driven, nearly 1 pound (450 grams) of carbon dioxide (CO<sub>2</sub>) emissions is avoided.

A "bicycle network" is defined to include, in any combination, demarcated bike lanes, bike trails, and streets with a maximum speed limit of 25 mph (40 kph). Both bike lanes and bike trails must meet the credit's width requirements.

If space for shower and changing facilities is limited, free access to on-site shower facilities or health club shower facilities within the LEED project boundary may be provided to all occupants in lieu of inhouse facilities. Health club or shower facilities must be accessible to occupants without their having to go outdoors and available during the project's hours of operation.

38. LT Credit Reduced Parking Footprint requirements:

Do not exceed the minimum local code requirements for parking capacity.

Provide parking capacity that is a percentage reduction below the base ratios recommended by the Parking Consultants Council, as shown in the Institute of Transportation Engineers' Transportation Planning Handbook, 3rd edition, Tables 18-2 through 18-4.

Case 1. Baseline Location

Projects that have not earned points under LT Credit Surrounding Density and Diverse Uses or LT Credit Access to Quality Transit must achieve a 20% reduction from the base ratios.

Case 2. Dense and/or Transit-Served Location

Projects earning 1 or more points under either LT Credit Surrounding Density and Diverse Uses or LT Credit Access to Quality Transit must achieve a 40% reduction from the base ratios.

For All Projects

The credit calculations must include all existing and new off-street parking spaces that are leased or owned by the project, including parking that is outside the project boundary but is used by the project. On-street parking in public rights-of-way is excluded from these calculations.

For projects that use pooled parking, calculate compliance using the project's share of the pooled parking. Provide preferred parking for carpools for 5% of the total parking spaces after reductions are made from the base ratios. Preferred parking is not required if no off-street parking is provided.

Mixed-use projects should determine the percentage reduction by first aggregating the parking amount of each use (as specified by the base ratios) and then determining the percentage reduction from the aggregated parking amount.

Do not count parking spaces for fleet and inventory vehicles unless these vehicles are regularly used by employees for commuting as well as business purposes.

LT Credit Reduced Parking Footprint Exemplary Performance

Case 1. Achieve a 60% parking reduction from the base ratios.

Case 2. Achieve a 80% parking reduction from the base ratios.

39. LT Credit Green Vehicles Requirements:

NC, CS, DC, HOS, R, HC

Designate 5% of all parking spaces used by the project as preferred parking for green vehicles. Clearly identify and enforce for sole use by green vehicles. Distribute preferred parking spaces proportionally among various parking sections (e.g. between short-term and long-term spaces).

Green vehicles must achieve a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (or local equivalent for projects outside the U.S.).

A discounted parking rate of at least 20% for green vehicles is an acceptable substitute for preferred parking spaces. The discounted rate must be publicly posted at the entrance of the parking area and permanently available to every qualifying vehicle.

In addition to preferred parking for green vehicles, meet one of the following two options for alternative-fuel fueling stations:

Option 1. Electric Vehicle Charging

Install electrical vehicle supply equipment (EVSE) in 2% of all parking spaces used by the project. Clearly identify and reserve these spaces for the sole use by plug-in electric vehicles. EVSE parking spaces must be provided in addition to preferred parking spaces for green vehicles.

The EVSE must:

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 projects outside the U.S.

Be networked or internet addressable and be capable of participating in a demand-response program or time-of-use pricing to encourage off-peak charging.

OR

Option 2. Liquid, gas, or battery facilities

Install liquid or gas alternative fuel fueling facilities or a battery switching station capable of refueling a number of vehicles per day equal to at least 2% of all parking spaces.

Schools

Option 1. Green passenger vehicles

Designate 5% of all parking spaces used by the project as preferred parking for green vehicles. Clearly identify and enforce for sole use by green vehicles. Distribute preferred parking spaces proportionally among various parking sections (e.g. between short-term and long-term spaces).

Green vehicles must achieve a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (or local equivalent for projects outside the U.S.)

A discounted parking rate of at least 20% for green vehicles is an acceptable substitute for preferred parking spaces. The discounted rate must be publicly posted at the entrance of the parking area and permanently available to every qualifying vehicle.

In addition to preferred parking for green vehicles, meet one of the following two options for alternative-fuel fueling stations:

Path 1. Electric Vehicle Charging

Install electrical vehicle supply equipment (EVSE) in 2% of all parking spaces used by the project. Clearly identify and reserve these spaces for the sole use by plug-in electric vehicles. EVSE parking spaces must be provided in addition to preferred parking spaces for green vehicles.

The EVSE must:

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 projects outside the U.S.

Be networked or internet addressable and be capable of participating in a demand-response program or time-of-use pricing to encourage off-peak charging.

OR

Path 2. Liquid, gas, or battery facilities

Install liquid or gas alternative fuel fueling facilities or a battery switching station capable of refueling a number of vehicles per day equal to at least 2% of all parking spaces.



OR

Option 2. Green buses and school-owned vehicles

Develop and implement a plan for every bus serving the school to meet the following emissions standards within seven years of the building certificate of occupancy: nitrogen oxide (NOx) emissions of 0.50 grams or less per brake horsepower-hour; and particulate matter emissions of 0.01 grams or less per brake horsepower-hour.

Emission standards must be met for each bus and not by an average of the entire fleet serving the school.

Develop and implement a plan for 100% of all other (non-bus) vehicles owned or leased to serve the school to be green vehicles. Green vehicles must achieve a minimum green score of 45 on the American Council for an Energy Efficient Economy (ACEEE) annual vehicle rating guide (or local equivalent for projects outside the U.S).

Warehouses and Distribution Centers

Option 1. Alternative-Fuel Vehicles (1 point)

Provide an on-site fleet with at least one yard tractor that is powered by electricity, propane, or natural gas. Provide on-site charging or refueling stations for the vehicles. Liquid or gas refueling stations must be separately ventilated or located outdoors.

OR

Option 2. Reduced Truck Idling (1 point)

Provide an electrical connection for at least 50% of all dock door locations to limit truck idling at the dock.