



LEED for Existing Buildings: O&M Sustainable Sites credit 4 – alternative commuting transportation

Update to Approach 1 in Option 3: Occupant Commute Survey February 2011

Administrative note – the following text describes an improvement to SSc4, Option 3, Approach 1 as described in the LEED EB: O&M Reference Guide. This change offers more flexibility and ease of use for LEED EB: O&M project teams, and will be formally published in upcoming Addenda. In the meantime USGBC and GBCI are posting it for free download to allow immediate use by LEED customers.

Approach 1

Solicit survey data from the entire population of regular building occupants. Every regular building occupant is asked to complete the survey. No minimum response rate is required for compliance, but higher survey response rates will provide a more accurate representation of occupant commuting behavior. Projects that achieve a survey response rate of at least 30% may extrapolate the alternative commuting rate to a portion of survey nonrespondents. Higher response rates allow for additional extrapolation to nonrespondents.

Following the completion of the occupant survey, project teams apply the following steps to determine the Reduction in Conventional Commuting Trips. The Reduction in Conventional Commuting Trips will be used to determine the number of points earned for this credit.

To assist with the analysis of the survey results, a free calculator tool is available on the LEED-EBOM Resources and Tools web page (<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=2084>).

Step 1: Total all of the reported occupant trips during the five day survey period. Make certain that responses such as “I did not work this day,” are not included in the total. From this total, determine the number of actual trips that qualify as alternative commuting trips. For purposes of this credit, trips that are not single occupant, conventionally powered and conventionally fueled vehicles are considered alternative commuting. Determine the Alternative Commuting Rate using Equation 1.

Equation 1:

| | | |
|--|---|---|
| Raw rate of alternative commuting trips | = | $\frac{\text{Number of Alternative Commuting Trips in the Survey Results}}{\text{Number of Total Trips in the Survey Results}}$ |
|--|---|---|

Step 2: Determine the Survey Response Rate using Equation 2.

Equation 2:

| | | |
|-------------------------------|---|--|
| Occupant Response Rate | = | $\frac{\text{\# of Survey Respondents}}{\text{\# of Regular Occupants}}$ |
|-------------------------------|---|--|



Step 3: Determine the Extrapolation Factor from Table # below, using the Survey Response Rate established in Step 2.

Table #: Extrapolation Factor

| Survey Response Rate | Extrapolation Factor |
|----------------------|----------------------|
| 60%-100% | 1.00 |
| 50%-59% | 0.80 |
| 40%-49% | 0.60 |
| 30%-39% | 0.40 |
| 0%-29% | 0.00 |

Step 4: Determine the number of Alternative Commuters using Equation 3. Drop any decimal places from the final calculated value.

Equation 3:

| | | | | | | | | | | |
|--|---|--|---|---|--|---|---|-----------------------|---|----------------------------|
| Overall Alternative Commute Trips | = | Raw rate of alternative commuting trips | * | { | (# of Non-Respondents * Extrapolation Factor) + (Number of Respondents) | } | * | 5 days per week | * | 2 commute trips per day |
|--|---|--|---|---|--|---|---|-----------------------|---|----------------------------|

Step 5: Determine the Reduction in Conventional Commuting Trips using Equation 4.

Equation 4:

| | | |
|--|---|---|
| Demonstrated Reduction in Conventional Commuting Trips (RCCT) | = | $\frac{\text{Total Alternative Commute Trips}}{(\text{\# of Regular Occupants} * 5 \text{ days/week} * 2 \text{ commute trips/day})}$ |
|--|---|---|

Example 1

Building A has 100 regular occupants, all of whom are asked to complete the occupant commute survey. Forty occupants respond. In Step 1, the total number of daily trips is tallied. For this example, some of the 40 respondents did not work during the five days of the survey period due to illness. A total of 392 trips were made (40 * 5 days/week * 2 trips/day - trips not taken due to absences.). Of these 392 trips, 196 were via single-occupied cars and 196 were via mass transit. Using Equation 1 the alternative commuting rate is calculated as 50%. In Step 2, the number of survey respondents is divided by the number of regular occupants, yielding an Occupant Response Rate of 40% (40 divided by 100). In Step 3, the extrapolation rate is given by Table # as 0.60. In Step 4, the number of alternative commute trips is calculated to be 380 (50% * { (60 * 0.6) + (40) } * 5 * 2). In Step 5, Equation 4 is used to produce the Demonstrated Reduction in Conventional Commuting Trips which equals 38% (380 Alternative Commute Trips divided by (100 * 5 * 2) maximum theoretical commute trips). The project's 38% Demonstrated Reduction earns 9 points under SS Credit 4.



Example 2

Building B has 100 regular occupants, all of whom are asked to complete the occupant commute survey. Sixty-six occupants (66%) respond yielding a total of 660 trips; 495 of these trips were either via mass transit or bicycle. Equation 1 in Step 1 equals 75% (495 divided by 660). Equation 2 in Step 2 equals 66% (66 divided by 100). The extrapolation factor in Step 3 from Table # is 1.00. Equation 3 in Step 4 equals 750 Alternative Commute Trips ($0.75 * \{ (34 * 1.0) + (66) \} * 5 * 2$). Equation 4 in Step 5 equals 75% (750 divided by 1000). The project's 75% Demonstrated Reduction earns 15 points under SS Credit 4.