

C-3. Use Local Construction Contractors



GHG Mitigation Potential



Variable reduction in GHG emissions from construction worker vehicles

Co-Benefits (icon key on pg. 34)



Climate Resilience

Reducing worker commute trip lengths saves fuels and can reduce sensitivity to price shocks or fuel scarcity.

Health and Equity Considerations

Refer to Measure IEP-1, *Local Labor and Apprenticeships (Construction)*, in Chapter 5.

Measure Description

This measure requires use of local construction contractors. Contracting construction work with a local company reduces VMT associated with construction employee commute distances and, therefore, reduces emissions from vehicle fuel combustion. Local hire provisions may cover the entire workforce or a percentage of the workforce based on the project size or employment type.

Scale of Application

Project/Site and Plan/Community

Implementation Requirements

Local hiring requirements should be expressed in the contractor bid specifications. Note that this measure is specific to local hire provisions for employees reporting to the construction site. Measure C-4, *Use Local and Sustainable Building Materials*, requires use of local building materials, which can reduce VMT and emissions from vendor and delivery trips.

Cost Considerations

Local and skilled workforce provisions can promote economic development, channeling some of the economic value of development directly to the community in which it is building. Decreased worker commute times and fuel savings may generate additional discretionary funds. Reduced car use may decrease the need for infrastructure spending on road maintenance.

Expanded Mitigation Options

Local workforce provisions may increase the likelihood of employee commute trips by transit, walking, or biking. Potential GHG reductions from mode shift are not reflected in the quantification methodology. Partner with local transit agencies to provide discounted transit passes to further incentivize alternative transportation.

Consider additional provisions for workforce training to bolster development of skilled trades and further economic growth. Requirements may include workers who have graduated from a Joint Labor Management apprenticeship training program approved by the State of California or who have at least as many hours of on-the-job experience in the applicable craft or are registered in an apprenticeship training program.





GHG Reduction Formula

$$A = (B - D) \times C \times E \times F \times G$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	GHG reduction from using local construction contractors	[]	MT CO ₂ e	calculated
User Inputs				
B	Distance provision of local hiring requirement	[]	miles/one-way trip	user input
C	Number of employees	[]	employees	user input
Constants, Assumptions, and Available Defaults				
D	Countywide average one-way employee commute trip distance	Table C-3.1	miles/one-way trip	2015 CSTMD
E	Employee trips per day	2	trips per employee	assumption
F	Vehicle emission factor	[]	g CO ₂ e per mile	CARB 2021
G	Conversion from g to MT	1 e ⁻⁶	MT per g	conversion

Further explanation of key variables:

- (B) – The local hire provision should specify the maximum average one-way travel distance for contracted staff.
- (C) – The number of employees required to report to the construction site and subject to the provision must be provided by the user.
- (D) – The average countywide vehicle trip lengths from the 2015 California Statewide Travel Demand Model (CSTDM) are provided in Table C-3.1 in Appendix C. The data are for home-based-work trips by traffic analysis zone averaged to the county level.
- (E) – The quantification method assumes all employees will make both an inbound and outbound trip per day.
- (F) – Users should obtain the carbon intensity of employee commute vehicles from CARB's (2021) EMFAC model. Employee commute vehicles are generally classified as light-duty automobiles (LDA) and trucks (light-duty truck class 1 [LDT1] and 2 [LDT2]). Users may obtain a weighted carbon intensity of these vehicle types using a 25/50/25 percent mix of LDA, LDT1, and LDT2, respectively. Alternatively, users may apply different weightings of vehicle fleet mixes if project-specific information is available.

GHG Calculation Caps or Maximums

(B < D). For implementation of this measure to result in a GHG reduction, the maximum average allowable travel distance must be less than the average countywide vehicle trip length assumed in the calculation.



Example GHG Reduction Quantification

The user reduces employee commute emissions by requiring all contracted employees to be located within a certain distance of a construction project. In this example, the construction project requires 100 employees per day (C) and is in Alameda County, where the average countywide home-based-work vehicle trip length from the 2015 CSTDM is 11.98 miles (D). The contractor agreement requires all staff reporting to the construction site to reside no more than 10 miles from the project (B). The weighted average carbon intensity for employee commute vehicles in Alameda County for the analysis year from EMFAC is 281 grams per mile (F).

$$A = \left(10 \frac{\text{miles}}{\text{trip}} - 11.98 \frac{\text{miles}}{\text{trip}} \right) \times 100 \frac{\text{employees}}{\text{day}} \times 2 \frac{\text{trips}}{\text{employee}} \\ \times 281 \frac{\text{g CO}_2\text{e}}{\text{mi}} \times 1e^{-6} \frac{\text{MT}}{\text{g}} = 0.1 \frac{\text{MT CO}_2\text{e}}{\text{day}}$$

Quantified Co-Benefits



VMT Reductions

Contracting construction work with a local company reduces construction employee commute VMT. The reduction in VMT can be calculated using the GHG reduction formula with the exception that (F and G) should be replaced with a value of 1 or otherwise be removed from the equation.



Energy and Fuel Savings

This measure will achieve vehicle fuel savings by reducing employee commute VMT. Total fuel consumption is a product of the vehicle fuel efficiency (gallons consumed per mile) and miles traveled. Fuel intensity factors can be obtained from CARB's (2021) EMFAC model. Users should multiply the vehicle fuel intensity factor by the VMT reduction (see above) to quantify fuel savings.



Improved Air Quality

Reducing fossil-fuel combustion from a local hire provision will also reduce local criteria pollutants. The reduction in criteria pollutant emissions can be calculated using the GHG reduction formula, where (F) represents the criteria pollutant intensity factors obtained from CARB's (2021) EMFAC model.

Sources

- California Air Resources Board (CARB). 2021. *EMFAC*. Available: <https://arb.ca.gov/emfac/>. Accessed: September 2021.