T-56. Active Modes of Transportation for Youth

GHG Mitigation Potential

Up to 22.2% of GHG emissions from school commute vehicle travel

Co-Benefits (icon key on pg. 34)

Climate Resilience

Planning that promotes more active modes of transportation for youth allows children to travel to a safe place more easily during emergencies. This measure could also take more cars off the road, resulting in less traffic and better allowing emergency responders to access a hazardous site during an extreme weather event. Furthermore, increasing youth active transportation modes can have health benefits, improving community resilience.

Health and Equity Considerations

Shifting children's trips to school from private car trips to bus, bicycling, or walking trips promotes consistent physical activity in children. Prioritize underserved areas with lower rates of vehicle ownership or fewer transit options.

Measure Description

This measure accounts for reductions in VMT achieved by projects that provide infrastructure to support any form of active transport among youth. Trips to school and extracurricular activities represent most of the everyday travel taken by youth. Thus, ensuring that children can use active transportation whenever possible can serve to reduce VMT and allow them to get the necessary exercise to live healthy lives.

Safe Routes to Schools (SR2S) provides federal funding for new sidewalks, bike lanes, off-street pathways, and street crossings to help children use active modes of transportation to get to school, bringing health benefits to children, in addition to reductions in VMT from mode-shifts away from private vehicle trips. This is a blanket measure that can cover projects related to all forms of active transport among youth. Methods for this measure were influenced by methodology from CARB (CARB 2023).

Subsector

School Programs

Locational Context

Urban, suburban

Scale of Application

Project/Site

Implementation Requirements

Specific projects that are implemented need not be funded by SR2S or be located at a school; however, one advantage of the program is the requirement for student travel surveys, which provide critical before and after project data, to quantify the effects of the program.

Cost Considerations

Depending on the improvement, capital and infrastructure costs may be high. Eligible projects may be able to utilize federal funding through California's SR2S program. In addition, the local municipality may achieve cost savings through a reduction of cars on the road leading to lower infrastructure and roadway maintenance costs.

Expanded Mitigation Options

When paired with Measure T-40, *Establish a School Bus Program*, students who live beyond walking or biking distance from their school will have an option for lower-emissions transportation to get to school.

GHG Reduction Formula

$$A = C \times F \times \frac{B\text{-}D}{G \times E \times (1\text{-}C) + C \times D \times F}$$

GHG Calculation Variables

ID	Parameter	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from vehicle travel among students within walking/biking distance	0–22.2	%	calculated
User Inputs				
B	Known or estimated percent of students within 2 miles who are driven to school after project implementation	0–100	%	Use survey data – see tools from SR2S
Constants, Assumptions, and Available Defaults				
C	Percent of students living within 2 miles of the school	62	%	SR2S Partnership 2013
D	Percent of students within 2 miles who are driven to school before measure implementation	51	%	SR2S Partnership 2013
E	Percent of students more than 2 miles who are driven to school	66	%	FHWA 2023
F	Average driving distance for students who could walk or bike to school	2	miles	Assumption
G	Average driving distance for students who cannot walk or bike to school (> 2 miles)	8.66	miles	FHWA 2023

Further explanation of key variables:

- (B) – This is the percentage of students who could walk or bike to school who are driven to school after the project implementation. An informed estimate could be used if calculating reductions for a future project; however, survey data after the fact will provide the most accurate result.
- (C) – It is estimated in SR2S Partnership's 2013 report that 62 percent of students live within 2 miles of their school. The assumption that students are not willing to bike or walk longer than 2 miles is a simplification that makes it easier to exclude students who could not have benefited from infrastructure or programming that encourages walking and biking to school. If survey data are available, users should select a value that is representative of the school, school district, or youth center where the project is being implemented.
- (D) – This represents the percentage of students who live within 2 miles from school but are driven to school nonetheless. This value is from the statewide average, but a local-specific value should be used if that is available for the school or school district.

- (E) – This represents the percentage of students outside of the 2-mile radius who are driven to school. This value is derived from 2022 NHTS data, but a local value should be used instead if it is available.
- (F) – This value represents the average driving distance for students who could walk or bike to school. This is based on the earlier assertion that students would not be willing to travel more than 2 miles by bike or on foot to school. If survey data are available, users should select a value that is representative of the school, school district, or youth center where the project is being implemented.
- (G) – Using 2022 NHTS data, it is estimated that the average driving distance for students who cannot walk or bike to school is 8.66 miles. If more local data is available for the school area, use that value instead.

GHG Calculation Caps or Maximums

Measure Maximum

(A_{max}) The percent reduction in GHG emissions (A) is capped at 22.2 percent. The benefits are unlikely to be this high because this level assumes that all students who could walk or bike to school start doing so.

Subsector Maximum

($\sum A_{max_{T\text{-}40\ \&\ T\text{-}56}} \leq 57\%$) This measure is in the School Programs subsector. This subcategory includes Measures T-40 and T-56 at the Project/Site scale of application. The school trip VMT reduction from the combined implementation of all measures within this subsector is capped at 57 percent. The reduction percentage for this measure is applicable to the School Programs subsector, which includes school commute trips. If users would like to apply the reduction percentage to community-wide emissions, the reductions can be converted to community-scale reductions by multiplying the reduction percentage by 1.64 percent (FHWA 2023).

Example GHG Reduction Quantification

A school installs a new raised pedestrian crossing in combination with an outreach program that brings children to school as part of a walking school bus. After this program is implemented, the percentage of students within 2 miles of school who are driven to school drops to 20 percent (B). This would lead to a reduction in GHG emissions from school trips of 13.5 percent.

$$A = 62\% \times 2\ \text{mi} \times \frac{20\% - 51\%}{8.66\ \text{mi} \times 66\%\ (1 - 62\%) + 62\% \times 51\% \times 2\ \text{mi}} = -13.5\%$$

Quantified Co-Benefits

Improved Air Quality

The percent reduction in GHG emissions (A) would be the same as the percent reduction in NOx, CO, NO_2, SO_2, and PM. Reductions in ROG emissions can be calculated by multiplying the percent reduction in GHG emissions (A) by an adjustment factor of 87 percent. See *Adjusting VMT Reductions to Emission Reductions* for further discussion.

Energy and Fuel Savings

The percent reduction in vehicle fuel consumption achieved by the measure would be the same as the percent reduction in GHG emissions (A).

VMT Reductions

The percent reduction in VMT achieved by the measure would be the same as the percent reduction in GHG emissions (A).

Sources

- California Air Resources Board (CARB). 2023. Clean Mobility Benefits Quantification Methodology. Available: https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/carb_clean-mobility-qm_draft_july2023.pdf. Accessed: August 2023.
- Federal Highway Administration (FWHA). 2023. 2022 National Household Travel Survey. Available: https://nhts.ornl.gov/.Accessed: December 2023.
- Safe Routes to School National Partnership (SR2S Partnership). 2013. Travel to School in California: Key Findings from the National Household Travel Survey. Available: https://saferoutespartnership.org/sites/default/files/pdf/Travel%20to%20School%20in%20California%20Policy%20Brief%20PAGES.pdf. Accessed: December 2023.