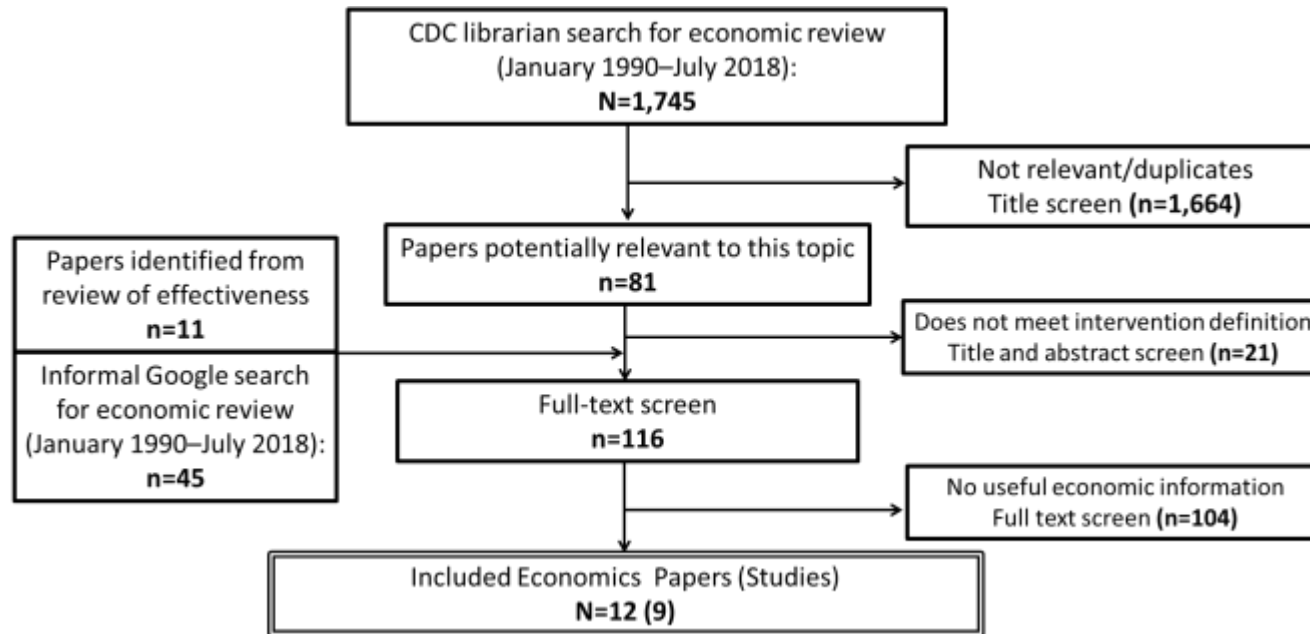


Supplementary Materials

Appendix Figure 1. Search yield.



CDC, Centers for Disease Control and Prevention.

Quality Assessment for Active Travel to School Economic Estimates

A. Study Information

Primary Study Author (Year): _____

Reviewer: _____

B. Intervention Cost Estimates*Part 1. Intervention Cost: Capture of Drivers*

The expected components of the interventions are engineering (infrastructure), enforcement (e.g. policing), encouragement (e.g. education), promotion and marketing. The drivers of intervention cost are deemed to be infrastructure and education.

From each study, determine what components of the intervention were delivered from the description of intervention and methods. If a component that is a driver was delivered but the cost is not included in the reported intervention cost, enter “1” under the limitation column, and add notes as necessary. If you feel that the authors have adequately addressed the cost driver, enter “0” under the Limitation? The ‘fatal flaw’ category is provided so that an estimate that is known with certainty to be very poor (for the reasons provided) can be summarily excluded from consideration in the review.

Capture of Drivers		Limitation for Missing Driver	Notes
Driver	Description of Driver		
Engineering	Engineering can be largescale street-level new construction or improvements such as for sidewalks, crosswalks, traffic signals, and signage or improvements within the school boundaries such as bicycle racks or cages.		
Education or encouragement	Education about: <ul style="list-style-type: none"> • physical activity and benefits of active travel for health • negative impacts of motorized transport on environment and health • training for safe bicycling and walking Encouragement is the promotion of active travel through		

	school activities and events.		
Fatal Flaw	Provide reason in Notes column (e.g., Reported estimate for intervention cost almost certainly excludes all or most of the components known to be delivered based on methods described in the study).		
TOTAL LIMITATIONS			
QUALITY GRADE		<input type="checkbox"/> Good (0-1) <input type="checkbox"/> Fair (2) <input type="checkbox"/> Limited (3 or more or fatal flaw)	

Part 2. Intervention Cost: Measurement Shortfalls

The intervention cost is ideally based on expenditures data collected during the intervention for each of the activities and any materials and resources used. The metric in which this cost is reported should ideally be on a per project or per school basis. In the case of ATS projects, it is often the case that funding comes from the national government and some matched funds are raised at the local government and community level. Volunteer labor and in-kind contributions should be appropriately valued and monetized. For the intervention cost reported in each study, assign limitations by entering a “1” in the limitation column for each area where there is a shortfall. Add notes as necessary. Enter “0” otherwise. The category of ‘Other’ is provided for cases where an important shortfall in a study is not listed in the table. The ‘fatal flaw’ category is provided so that an estimate that is known with certainty to be very poor (for the reasons provided) can be summarily excluded from consideration in the review.

Shortfall in Measurement		Limitation for Measurement Shortfall	Notes
Area	Description of Shortfall		
Size	Small sample (less than 100 students)		
Scaling	Per capita cost uses inappropriate denominator for target population		
Source	Not based on detailed data collected within project.		
Valuation	The unit price assigned to resources is not appropriate (e.g. volunteers valued at zero cost, prices not drawn from local		

	markets)		
Other	Any shortfall not listed in this table. Please name the limitation in the Notes column		
Fatal flaw	Provide reason for fatal flaw in Notes column (e.g., Inadequate information to derive intervention cost where an explicit estimate was not provided).		
Total limitations			
QUALITY GRADE		<input type="checkbox"/> Good (0-2) <input type="checkbox"/> Fair (3-4) <input type="checkbox"/> Limited (5 or more or fatal flaw)	

C. Economic Benefit Estimates

Part 1. Benefits: Capture of Drivers

The benefits of active travel to school derive from the health benefits of increased physical activity and health benefits from reduced pollution. It also includes reduction in private automobile use which reduces its cost of operation and averts impacts on travel time, congestion, and the environment. All these components of total benefits from active travel to school are drivers of benefit.

From each study, determine what components of total benefits reported by the study include the drivers of economic benefit. Enter “1” under the limitation column for each driver that is missing from the total benefit estimate. Add notes as necessary. Enter “0” otherwise. The ‘fatal flaw’ category is provided so that an estimate that is known with certainty to be very poor (for the reasons provided) can be summarily excluded from consideration in the review.

Capture of Drivers		Limitation for Missing Driver	Notes
Driver	Description of Driver		
Health	Health related benefits derive from increased physical activity and from reduced pollution.		
Private vehicle use	Reduced private vehicle use reduces the cost of repairs, maintenance, and consumables.		
Travel time	Active travel to school can reduce parent or guardian time spent transporting children to schools.		
Injuries and fatalities	Street, roadway, and sidewalk safety improvements reduce student pedestrian and bicyclist injuries and fatalities.		
Busing	Increased active travel to school reduces school busing including hazard busing.		
Congestion	Active travel to school reduces congestion.		
Pollution and greenhouse gases	Active travel to school reduces motorized travel and reduces pollution.		
Fatal Flaw	Provide reason for fatal flaw in Notes column (e.g., No description provided for what components were included in benefits).		
TOTAL LIMITATIONS			
QUALITY GRADE		<input type="checkbox"/> Good (0-2)	

	<input type="checkbox"/> Fair (2-6) <input type="checkbox"/> Limited (7 or more or fatal flaw)	
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Part 2. Benefits: Measurement Shortfalls

The intervention being evaluated is active travel to school which is expected to shift more students towards walking or bicycling to school. The increased frequency of walking and bicycling to school implies shift away from private vehicle travel and busing. Particularly in the United States, improved safety of walking and bicycling to school is expected to reduce injuries and fatalities. Where the benefits are modeled or estimated, the method must be based on observed change in walking or bicycling. These are other considerations are used to quality score the estimates of benefit based on the appropriateness of methods used in measurement and valuation. For the intervention benefit reported in each study, assign limitations by entering a “1” in the limitation column for each area where there is a shortfall. Add notes as necessary. Enter “0” otherwise. The category of ‘Other’ is provided for cases where an important shortfall in a study is not listed in the table. The ‘fatal flaw’ category is provided so that an estimate that is known with certainty to be very poor (for the reasons provided) can be summarily excluded from consideration in the review.

Shortfall in Measurement		Limitation for Measurement Shortfall	Notes
Area	Description of Shortfall		
Size	Small sample (less than 100 students)		
Perspective	Perspectives that are more limited than societal (e.g. cost and benefit for school system alone)		
Time horizon	10-year time horizons are appropriate for infrastructure projects. Assign limitations for much longer or much shorter horizons that may not make sense for local funders.		
Source of benefit	<p>The primary source of benefit for ATS interventions must be based on mode shift away from private automobile use and towards walking and bicycling OR from reductions in injuries. Departures from this requirement may include:</p> <ul style="list-style-type: none"> • ATS change based on counts of those using sidewalks or pathways, with attendant problem of possible diversion from elsewhere. 		

	<ul style="list-style-type: none"> The change in walking or bicycling was self-reported by students or parents, with attendant problems of recall bias. 		
Method	Methodology for estimation of benefits is opaque or not peer-reviewed (e.g. no explicit computations or citations are provided for increased walking/bicycling → increased physical activity → averted ill health → averted healthcare cost).		
Valuation	The unit price assigned to resources is not appropriate (e.g. reduced congestions not valued using local prices)		
Population	Inappropriate population assumed for benefit (e.g. not school students; students who do not live close enough for walking or bicycling to be feasible).		
Other	Any shortfall not listed in this table. Please name the limitation in the Notes column		
Fatal flaw	Provide reason for fatal flaw in Notes column (e.g., Benefits based solely on healthcare cost averted due to averted obesity).		
Total limitations			
QUALITY GRADE		<input type="checkbox"/> Good (0-3) <input type="checkbox"/> Fair (4-6) <input type="checkbox"/> Limited (7 or more or fatal flaw)	