Walking, Biking, and Rolling to School: Trends, Issues and Evidence

There is a growing body of research about frequency of walking, biking, and rolling to school and factors that impact active travel to school. This document summarizes the major patterns and research. Use the information categorized under the topics most compelling for your community.

Trends in active travel to school

Fewer students walk or bicycle to school than did so in the past.

- In 1969, 48 percent of students in grades K through eight (ages 5 through 14) walked or bicycled to school.[1]
- In 2017, only 11 percent of students in grades K through eight walked or bicycled to school.[1]
- In 1969, 89 percent of students in grades K through eight who lived within one mile of school usually walked or bicycled to school.[2]
- In 2009, only 35 percent of students in grades K through eight who lived within a mile of school usually walked or bicycled to school even once a week.[2]
- Active travel to school has been historically lowest among high school students (grades 9 through 12), with fewer students walking and bicycling to school in both 1969 (26.4%) and 2017 (8.8%).[3,4]

This is an opportunity lost. Walking or bicycling to school gives school-aged youth:

- Time for physical activity;
- Sense of responsibility and independence;
- An opportunity to be outdoors;
- Time to connect with parents, friends, and neighbors;
- Communities with less traffic congestion.

Some places and people are at greater safety risk and need to be a priority for attention.

- Especially in urban areas, children from low-income households are twice as likely to walk to school than higher income students for many reasons including not owning a vehicle and parents' work schedule.[5]
- Low-income neighborhoods have disproportionately less pedestrian and bicycle infrastructure like sidewalks, street lighting, crosswalks & traffic calming (signs, speed bumps) and have more high speed and high traffic volume roads near them. [6,7]
- Children from low-income neighborhoods are at greater risk of pedestrian injury.[8]
- Black, Hispanic and American Indian/Alaska Native children all have higher rates of child pedestrian deaths than White children.[9,10]
- Most students with physical disabilities experience barriers within the built environment that limit active travel to school.[11]

Around the country communities are working to improve health and increase the appeal of walking, bicycling, and rolling to school. There are signs of success that help shed light on what could help bring positive changes to even more places. While there is much work to be done, we are on the right track.

- One-time events like Walk/Bike & Roll to School Day can increase the number of students who utilize active travel to get to school even weeks after the day of the event.[2,12,13]
- Walk/Bike & Roll to School events often turn into regularly occurring walking and bicycling programs, which over time can get significantly more students walking and bicycling to school.[12]
- Parent survey data collected by 6,500 schools from 2007 through 2014 show that parent-perceived school support for walking and bicycling for the school trip increased from 24.8 percent to 40.8 percent from 2007 to 2014.
- Complete Streets policies which aim to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities, support the concepts needed for safe walking and bicycling to school. Since the late 1990s more than 1600 regional and local agencies, 35 states, the Commonwealth of Puerto Rico, and the District of Columbia have adopted Complete Streets policies.[14]

Barriers impacting safe, active travel to school

Changes in school size and location have affected children's ability to walk, bike, or roll to school.

- One of the strongest predictors of walking and bicycling to school is a household's distance to school, with more than 75% of walking and biking trips to school being less than a mile.[3]
- Over the past few decades, many communities have moved away from smaller, centrally located schools to larger schools on the edge of communities where land costs are lower, and acreage has been more available.
- An increasing number of families are using school choice, charter, and magnet schools which means they are traveling further than the school closest to home.[15]
- The percentage of students in grades K through 8 who live less than one mile from school has declined from 41 percent in 1969 to 31 percent in 2009.[1,2]
- In 2017, the median distance between home and school was 2.7 miles (elementary students median is 2.1 miles, middle school students 3.2 miles, and high school students 3.6 miles to school).

Traffic-related safety concerns can impact decisions to walk, bike, or roll. When more children are driven, more parents become convinced that traffic conditions are unsafe for walking, biking, and rolling.

- School travel by private family vehicle for students grades K through 12 accounted for 10 percent of all automobile trips made during the morning peak period (7:00am to 9:00am) in 2017 and 1.5 percent of the total annual trips made by family vehicle in the U.S.[3,16]
- Fifty-five percent of parents who reported not allowing their children to walk or bicycle to school identified the number of cars along the route to school as a significant issue in their decision-making process.[17]
- In 2009, approximately 40% of parents who drove their children to school returned home immediately after dropping their children at school.[18]
- If more children walked or bicycled to school, it would reduce the number of cars near the school at pick-up and drop-off times, making it safer for active travelers and reducing congestion.[19]

Built environment and safety

Walking and bicycling need to be safe and accessible transportation options. This means creating safe environments for students of all abilities and teaching safety skills to walkers, bicyclists, and drivers.

How streets are designed plays a role in the speed at which people travel – number of lanes, distance of buildings from the street, landscaping, medians, signage, on-street parking.

- Higher speeds exponentially increase the chances that a driver will hit a pedestrian crossing or along the roadway and that the injuries sustained will be life changing (brain injury, physical impairment) or life ending.
- Speeding reduces a driver's peripheral vision, increases the distance needed to stop and increases the severity of injury to a pedestrian in a crash.
    - A car traveling 40 mph requires 300 feet, or an entire football field, to come to a complete stop. At 30 mph a car needs 200 feet to stop and at 20 mph requires only 100 feet.

Improvements to the built environment (streets, sidewalks, walkways, and parking lots) promote safe and accessible active travel to school for all students.

- Continuous sidewalk and bicycle paths connecting homes with schools;
- Well maintained sidewalks free of obstructions – excessive cracks, holes, tree roots, overgrown vegetation;
- Sidewalks and raised medians that are at least 5 feet wide and include curb ramps with textured surfaces;
- Accessible pedestrian signals that give information through sound and touch and are low enough to be used by all students;
- Shorter crossing distance – raised medians and curb extensions;
- Extended crossing time and leading pedestrian intervals;
- Traffic calming measures – curb extensions, speed humps and tables, and parking restrictions.

Champions within the school and community play a vital role in advocating for improvements to the built environment to promote active travel to school.

- Local officials – Support changes that improve walking and bicycling conditions around schools through policy and funding.
- Local transportation staff – Maintaining crosswalks and bike lanes, installing signs, repairing sidewalks.
- Parents - Creating awareness of the need for opportunities to walk and bicycle.
- Media professionals - Re-framing the conversation around safety and crashes.[20]

Short periods of skill-based training can significantly help students use the built environment safely. [21]
Safety education activities include how to:

- Choose where to walk and where to cross streets
- Work together with crossing guards
- Make themselves visible to drivers
- Stay aware of their surroundings (including keeping their phones away while walking)

Physical environment and air quality

Private vehicles are among the largest sources of human-made air pollution, threatening both human and environmental health.[22]

- Concentrations of traffic-related air pollutants are higher near major roads. In the US, nearly 17,000 schools are located within 250 meters of a major road.[23]
- Vehicle idling, such as in a pick-up queue at a school, is one of the most common and serious, yet avoidable contributors to air pollution. Idling produces more air pollution than stopping and restarting your car.[24]
- Walking and bicycling to school provide opportunities for children and families to reduce their carbon usage and contribute to the health of the environment.

Air pollutants are especially harmful to children's physical health and academic performance due to their smaller lung size and higher inhalation rate.

- Children breathe 50 percent more air per pound of body weight than adults.[25]
- Motor vehicles emit air pollutants that can cause short-term health problems in children – headaches, nausea, skin and eye irritation, and nose, throat, and lung inflammation.
- These pollutants can also aggravate and intensify long-term health problems, such as asthma, cystic fibrosis, and heart disease.[26–28]
    - Asthma is a leading cause of children missing school in the US, with more than 13.8 million school days lost annually due to childhood asthma.[29]
- Children exposed to high levels of vehicle emissions were found to have significantly lower grades, even when controlling for other factors that affect school performance.[30]
- Exposure to air pollutants while walking to school is associated with a reduction in the growth of working memory.[31]

The long-term health benefits of increased physical activity achieved through active travel to school generally outweigh the health risks of air pollution. However, efforts should still be made to minimize students' exposure to air pollution.

- Air quality is measurably better at schools placed in neighborhoods with integrated street and sidewalk networks, and these schools have more students arriving by bicycle and on foot.[32]
- Where possible, plan walking routes through low traffic streets to increase safety and minimize children's exposure to air pollutants.[33]
- The largest reduction in exposure to air pollutants for pedestrians can be achieved by avoiding close proximity to traffic queuing up at intersections, and where possible, walking on the side of the road opposite the traffic, especially during the morning commute period.[34]
- A study of London schools revealed that closing the roads around schools to traffic at pick-up and drop-off times has reduced polluting nitrogen dioxide levels by up to 23 percent and is strongly supported by parents.[35]
- Implement no idle zones around the school, urging drivers to turn off engines when they expect to be stopped for more than 30 seconds.

Physical activity

Physical activity contributes to overall health and academic performance for students.[36]

- Weight control
- Reducing blood pressure
- Raising HDL ("good") cholesterol
- Improved cardiorespiratory endurance, muscular fitness, and bone health
- Reduction in the risk of diabetes and some kinds of cancer
- Improved mental health

- Improved cognition (memory, executive function, processing speed)
- Improved independence and social health
- Improved academic performance[37–40]

Only twenty percent of school-aged youth (ages 5-17) meet the daily recommendations for physical activity.

- School aged-youth (ages 5-17) need at least 60 minutes of moderate-to-vigorous physical activity daily.[36]
- As age or grade in school increases, physical activity participation drastically declines.[41]
- Less active children are more likely to be overweight, which increases their risk of obesity and chronic disease types in adulthood (diabetes, heart disease, high blood pressure, asthma, various cancer types)[42–47]
    - In 2019, 31% of children aged 10 to 17 years old were overweight or obese.[48]

Children with disabilities are 4.5 times less likely to engage in physical activity compared to children without disabilities.[49]

- Children with disabilities have been overlooked and systematically excluded from physical activity opportunities (non-accessible playgrounds and routes to school, lack of adapted physical education).
- Creating a Walk/Bike & Roll to School Day event that is inclusive for children with and without disabilities ensures all students can receive the benefits of the program, enjoy each other's company, and learn safe and healthy habits together.

Walking, bicycling & rolling to school offers an opportunity for children to get physical activity as part of their daily routine.

- Active travel to school can contribute significantly to children getting the recommended amount of daily physical activity.[50]
- Walking School Buses provide an opportunity for school-aged youth to meet their daily physical activity recommendations.[34]

An active trip to school offers children an opportunity to spend time outdoors.

- When appropriate and safe, walking and bicycling to school is an experience that can help children develop a sense of independence that is important for development.[33,51–54]
- Exposure to nature can have multiple health benefits including stress reduction, relief of ADHD symptoms in children and increased cognitive and motor functioning.

About Safe Routes to School

Safe Routes to School (SRTS) programs are sustained efforts by community members, advocates, community leaders, families, school, public health, and transportation officials in local, state, and federal governments to enable and encourage children to safely walk or bicycle to school.

- As of June, 2016 federal funding had enabled more than 19,035 schools across the country to participate in the national Safe Routes to School program.
- In May 2006, the National Center for Safe Routes to School was established to assist communities in enabling and encouraging children of all abilities to safely walk and bicycle to school. The National Center for Safe Routes to School coordinates National Walk & Roll to School Day and Bike & Roll to School Day in the U.S. and is located at the University of North Carolina Highway Safety Research Center.
- Many communities launch SRTS programs because of Walk/Bike & Roll to School events.

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