Excerpt from:
Cool Planning: A Handbook on Local Strategies to Slow Climate Change
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15 Find Better Models for Big Trip Generators

An urban Target store in downtown Minneapolis.

Image: Ellerbe Becket Architects
credit: Joel Koyama Photography

Some land uses generate so many trips that they warrant special attention. Schools and big-box stores are two examples. According to some studies, school-related trips can increase morning rush-hour traffic by as much as 30 percent,[125] while big-box stores can generate as many as 10,000 car trips a day. [126] So many motor vehicle trips mean big carbon footprints.

These land uses also have indirect effects on greenhouse gas emissions through what might be called their "gravitational pull." That is, they are big land uses that attract people and other development that want ready access to them. For example, schools strongly influence home-buying decisions, often attracting homeowners away from closer-in, walkable neighborhoods to auto-dependent subdivisions in outlying areas. Big-box stores can, and often do, shift local retail centers of gravity and draw merchants away from compact, pedestrian-friendly downtowns to car-reliant exurbs. [127]

Fortunately, and as we shall see below, local governments, schools, and big-box stores can work together cooperatively (and in a number of cases, have done just that) to reduce carbon-generating trips through good location decisions and more creative building and site design.

In this chapter we focus not on school or big-box structures, which sometimes incorporate green building concepts. Rather, we look at siting practices that increase reliance on carbon-intensive transportation modes for these big and uses.

Schools

Where's the oldest high school in your town or neighborhood? How much land does it occupy? How tall is it?

Now think of the newest school and ask yourself those same three questions: where is it, how much land does it take, and how tall is it?

Chances are the old school you're thinking of is quite different from the new one. If your town is like most American towns, the old school is near the downtown or nestled in a residential neighborhood. It's a multi-story building and doesn't take up much land. In contrast, the newest school probably is on the far edge of town, spreads over many acres, and has only one story. It's surrounded by a large parking lot for cars and a staging area for buses.

Children who once walked to the old school must now be bused or driven to the new one. The concept of spontaneous play on sites that young people once reached independently has yielded to the scheduling of athletic and other events in far-flung locations to which time-strapped parents must chauffeur their children, often through heavy traffic. [128] And all those cars and mini-vans and buses driving to and fro ever since have been emitting about a pound of carbon dioxide into the atmosphere for every mile driven.

Statewide data on the percentage of Oregon students who walk and bike to school are not available at this writing. For the nation, however, the percentage of students who walk or bike to school has fallen from 48 percent in 1969 to less than 13 percent today. [129] With this precipitous decline has come an equally dramatic increase in the size of school sites. According to one study, school site size has increased every decade since the 1950s and school sites developed in the last 20 years are 41 percent larger than those built on previously. [130]

Walking to school is more likely to be an option when the school is located on a smaller site and fits into the neighborhood.

The decline in walking to school and the increase in school site size are related. A major reason: Distance is the number one barrier to walking and biking to school. [131]

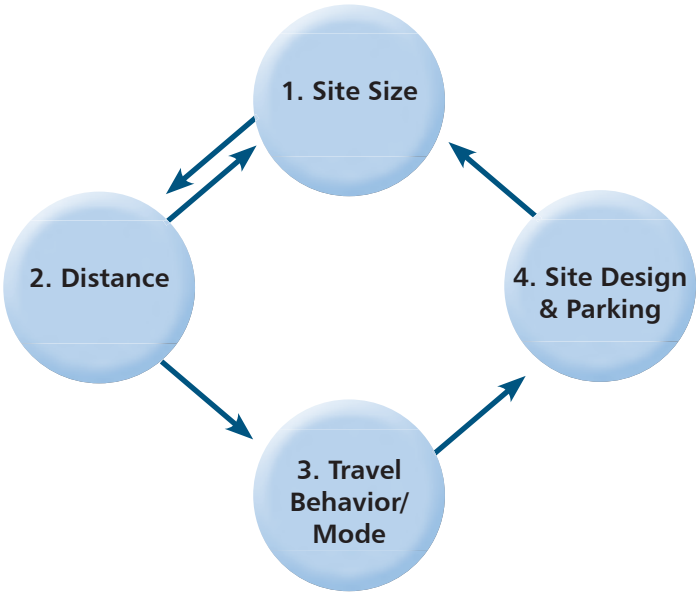
Large school site sizes increase the distance between schools and neighborhoods. School sites as large as 13 to 60 acres are common today. That's roughly the equivalent of 14 to 65 city blocks the size of those found in downtown Portland. Because parcels this large are hard to find at affordable prices in already developed areas, school districts often purchase sites on the

outskirts of town or even outside the urban growth boundary. But doing so may require the purchase of considerably more land in order to provide the large amounts of surface parking necessary because edge-of-town sites are usually so far away that students must drive or be driven to schools. School parking lots often exceed the size of the school building's footprint itself.

A remote and auto-centric school, inaccessible by foot or bike.

The more distant the school, the more students must drive or be driven or bused to school. Student travel modes, in turn, affect the school site design. The more students who arrive by motor vehicles, the more land is required for parking, bus staging areas, and retention zones to handle stormwater runoff from large, impermeable parking lots. The more driving to school, the more auto-centric and less pedestrian-friendly the school's site design.

The sequence in which one considers these factors is critical. School site size comes first, for it affects the distance between school and neighborhood. Distance influences student travel behavior – and the amount of parking needed at the school. The amount of parking, in turn, affects the school site size. In a nutshell, the problem is circular, as shown in the diagram.



School site size affects travel distance, travel behavior/ mode, and school site design, including the amount of parking needed.

Although putting a new school on a large site at the city's edge may reduce up-front capital costs for the school district, it is likely to increase other costs, especially those related to transportation. For the most part, those costs get passed on to the community or the state. During the 2008-09 school year, the State of Oregon paid $174 million – up from $120 million in the 2000-2001 school year –

A neighborhood centered school.

Image: Adrian Fine, National Trust for Historic Preservation

for student transportation. [132] The state reimburses school districts for between 70 and 90 percent of student transportation costs. [133] There are no incentives in this reimbursement formula for school districts to consider the effects of siting decisions on VMT or GHG emissions.

Public health officials lament the decline in walk-to-school rates and the hazards of walking in today's built environment. They see the elimination of simple exercise like walking from students' daily routine as partially responsible for the alarming obesity epidemic among young people. Conversely, they believe that a return to more walkable schools – and more pedestrian-friendly environments in general – would help. "A simple intervention like walking to school is a climate change intervention, an obesity intervention, a diabetes intervention, a safety intervention," says Dr. Howard Frumkin, M.D., director of the National Center for Environmental Health at the Centers for Disease Control and Prevention. [134] Richard J. Jackson, M.D., chair of the University of California's (at Los Angeles) Environmental Health Sciences Department, associates several educational benefits with walking and biking to school: increased concentration, greater alertness, and improved memory and learning. [135]

Some observers believe that the greatest contribution to physical activity among sedentary individuals must come from modest intensity activities such as walking and bicycling. They note that, in contrast to strenuous exercise programs, moderate activities such as walking can be more easily integrated into a person's daily schedule and are more likely to take hold as a permanent, lifelong habit. [136] As one report puts it:

When we reduce physical activity to "exercise" that is separate and apart from our daily routines, we encounter obstacles related to time, money or motivation that make it difficult to maintain such activity over time. Reintroducing activity into daily routines is a practical way to overcome such obstacles." [137]

The most universal opportunity for "incidental" physical activity among children lies in getting to and from school, according to the Committee

on Environmental Health of the American Academy of Pediatrics. The Committee notes that "purposeful walks," such as a trip to school and other utilitarian trips play an important role in promoting healthy life styles and are influenced by neighborhood design. [138]

For public health and other reasons, school districts in Oregon and around the country are revisiting the merits of building schools on smaller sites in walkable neighborhoods. One example is the Bush Elementary School in Salem. Occupying a site of 2.6 acres, the school is nestled in a residential neighborhood while enjoying access to an adjacent park. In an example of school district-local government cooperation, the city of Salem waived a zoning provision to avoid forcing the school to build a parking lot that would have created a barrier between the school and an adjacent park. Now the students can enjoy the park during recess without having to cross a parking lot. Many parents now walk their children to school. Without large bus and car drop-off zones in front of the school, it's easier for the parents to stay a few extra minutes, after leaving their children, to visit informally and face-to-face with teachers and other parents.

The city of Salem and the Salem-Keizer School District collaborated to site Bush Elementary in the heart of a residential area and to design the school in a pedestrian friendly way.

According to the EPA, neighborhood schools, such as schools located on smaller sites in walkable communities, would reduce traffic, produce a 13 percent increase in walking and biking, and a reduction of at least 15 percent in emissions of concern. [139]

All of this is not to say that creating such schools is easy. Far from it: school board members and school officials face myriad competing demands and daunting challenges when making decisions about where to site schools. They typically struggle conscientiously to provide the best education for today's youth. By exploring the possibility of building schools on smaller sites – sites amenable to walking and biking – school districts can help not only to reduce vehicular travel and GHG emissions, but also to help make schools:

- stronger neighborhood anchors;
- easier for parents to engage in impromptu, face-to-face exchanges with teachers and other parents; and
- more accessible to the community for civic activities (a plus when community support is needed for school bond issues).

Finally, money saved on busing and other transportation costs is money that might go toward better teacher salaries, educational programs, or both.

How can local governments encourage climate-friendly school siting? Here are some actions to consider.

1. Request a copy of your school district's facility master plan. How does it relate to the city's local comprehensive plan? Is it compatible or does it run counter to the city's vision for its future? How will it affect the city's transportation-related carbon footprint? Will schools planned be within walking and biking distance of neighborhoods served? Can school facilities (ball fields, auditoriums, etc.) be shared with the community? Local governments should weigh in on these questions.
2. Work with the local school district. Coordinate local comprehensive plans with school facility plans. Avoid the "silo planning syndrome" in which school districts and local governments don't talk to each other. School siting decisions permanently affect local land use patterns, which affect city transportation and capital improvement budgets. Local governments have a big stake in school siting decisions.
3. Encourage the school district to maintain existing schools and to renovate them when possible. Many older and historic schools were well-built, are located in well-connected, walkable neighborhoods, and can be renovated to state-of-the-art standards. When they can't be, they might be replaced with a new, pedestrian-friendly school on the same site instead of a stand-alone facility on a remote site accessible only by motor vehicle.

Built in 1912, Lewis and Clark High School in Spokane, Washington has been renovated to meet state-of-the-art standards.

4. Do cost comparisons. If the construction of new schools on outlying sites is under consideration, look hard at the long-term transportation costs. Then factor these into the new-construction-vs.-rehabilitation cost comparison. In obtaining cost estimates for school renovation projects, turn to architects experienced in the rehabilitation of older buildings rather than to those who are unfamiliar with them.

5. Be aware that neither the State of Oregon nor the Federal Government sets minimum acreage requirements for school sites. Moreover, outdated standards once recommended by a private sector organization have been rescinded. [140] School districts are free to build multi-level schools with smaller footprints – schools more easily located on sites closer to population centers and in neighborhoods. The LEED-Neighborhood Development rating system, developed by the U.S. Green Building Council, recommends that new school campuses *should not exceed* five acres for an elementary school, ten acres for a middle school, and 15 acres for a high school. [141]

6. Encourage measures that will enable more students to walk or bike to school. Will the new school provide bike racks for students? Are there sidewalks and bike paths leading up to the school? How safe are they? Are they continuous and uninterrupted? Or do they have gaps that need filling? Are street crossings safe? Are streets near schools narrow enough to cross safely? When appropriate, contact the Oregon Safe Routes to School Program, which offers technical assistance and grants for pedestrian and bicycle improvements as well as education and advocacy initiatives. The Oregon Transportation and Growth Management Program (TGM) makes grants to local governments and school districts to help them plan for safe routes to school and to address school siting challenges.

Publications and Resources

- *Historic Neighborhood Schools*, National Trust for Historic Preservation, at http://www.preservationnation.org/issues/historic-schools/
- *LEED-Neighborhood Development Rating System*: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=148 (see the Neighborhood Schools section at p. 76.
- *Oregon Safe Routes to School Program*, at http://www.oregon.gov/ODOT/TS/saferoutes.shtml
- *Smart Growth Schools*, National Clearinghouse on Educational Facilities (section) at http://www.edfacilities.org/rl/smart_growth.cfm#9068
- *Travel and Environmental Implications of School Siting*, Smart Growth Network of the U. S. Environmental Protection Action, at http://www.epa.gov/livability/pdf/school_travel.pdf
- *Walkable Schools Page* on the Oregon Transportation and Growth Management Program's web site: http://www.oregon.gov/LCD/TGM/walkableschools.shtml