Heart of New Ulm: Complete Streets and Walkability Workshop

Key Findings and Recommendations

hearts beatback

THE HEART OF NEW ULM PROJECT

Mark Fenton

and the

Walkable and Livable Communities Institute

Cover Photo: Children arrive for the start of the school day at Jefferson Elementary in October 2013. The Complete Streets and Walkability Workshop found that an opportunity exists to improve arrival and departure practices for both the elementary and high school.

Throughout the United States, we have applied advanced engineering to move more cars and to move them faster. The results too often have been streets that accommodate only cars and that deter people from using active modes of transportation. Our ensuing lack of daily physical activity has contributed to declining public health. In fact, in 2008, 107 million Americans—almost half of all adults 18 or older—had at least one of six reported chronic illnesses: cardiovascular disease, arthritis, diabetes, asthma, cancer or chronic obstructive pulmonary disease (COPD).

To combat this trend, many organizations throughout the country are promoting "complete streets" and walkability as a means of reintroducing physical activity into Americans' daily lives. The outcomes are promising: study after study shows that walkable, bikeable, and livable communities are also healthier communities, not only in terms of individual health, but also environmental and economic health. Consider that:

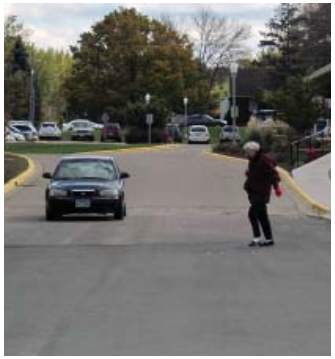
- A study published in the Journal of the American Planning Association in 2006 found that for every five-percent increase in walkability, a community could expect more than a 30-percent increase in "physically active travel" and reduced body-mass index, which is a common indicator for weight and overall health. The increase in walkability also was correlated with more than a five-percent reduction in air pollutants that are associated with vehicle travel.
- Analysis published in Preventive Medicine in 2010 indicates that installing sidewalks on all of a city's streets would increase physical activity enough to offset weight gain in about 37 percent of the population, leading to health-care savings that could repay the cost of installing the sidewalks.
- A study published by CEOs for Cities in 2009 shows that in 13 of 15 housing markets evaluated, a one-point increase in a neighborhood's WalkScore (www.walkscore.com) increased homes values as much as $3,000.

The Heart of New Ulm Project is an initiative to focus on preventive care and reducing risk in order to reduce the number of heart attacks in New Ulm, Minnesota. In accordance with its goals and objectives, the Hearts Beat Back: The Heart of New Ulm Project—a collaborative partnership of Allina Health, the Minneapolis Heart Institute Foundation and the community of New Ulm—commissioned national walkability expert Mark Fenton and Kelly Morphy, executive director of the Walkable and Livable Communities Institute, to facilitate a Complete Streets and Walkability Workshop and related events in New Ulm in October 2013.

The workshop included stakeholder meetings, site assessments, a leadership workshop, a walking audit, a workplace wellness luncheon, and a presentation to—and short walking audit with—Brown County commissioners.

This report outlines the key findings of the workshop. Although this report doesn't constitute a traffic study and is based on brief observations at key locations, it lays out important recommendations and conceptual designs for leaders to consider as they strive to improve health in New Ulm through Complete Streets, walkability and a better built environment.

Below, city leaders form a "human curb extension" during a walking audit with national walkability expert Mark Fenton in October 2013.



Workshop Outcomes:

Key Findings and Recommendations

Key Recommendations

Based on Community Walking Audits and Workshop Findings

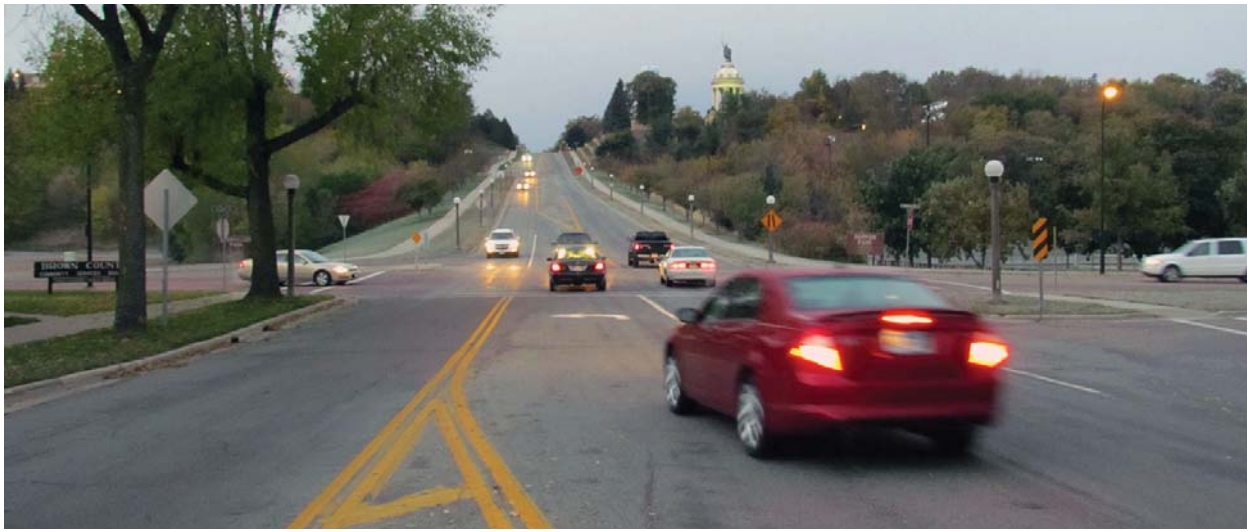
- **A** Transform the Intersection of Center and Garden
- **B** Create a School Arrival/Departure Process
- **C** Redesign Garden Behind the Schools
- **D** Build Mid-Block Crossings on Garden
- **E** Revitalize Downtown
- **F** Add Bike Trail Connections
- **G** Additional Recommendations

A Transform the Intersection of Center Street and Garden Street

Simplify this complex intersection to better support all roadway users

At Center and Garden, a complex intersection serves as a barrier to people accessing important amenities located within walking distance of each of its four corners, including the baseball park, the high school, Brown County Community Services, the recreation center, residences, Martin Luther College and, up the hill, the iconic Hermann Heights Monument.

According to 2010 data from the Minnesota Dept. of Transportation, traffic volumes at the Center and Garden intersection are relatively low (see the appendix), but the complexity of the junction and the high number of vehicles that are turning—not just continuing straight through the intersection—makes the area feel congested and dangerous to people walking, biking and driving.



Above: Morning traffic right before high school classes begin isn't very heavy in terms of traffic volumes, but the intersection is complex and daunting, with a lot of vehicles from Center turning onto Garden and many on Garden trying to enter Center. Below, trying to cross the intersection on foot is downright scary. This high school student waited patiently for drivers to yield, but none did. An adult wearing a safety vest who was documenting the intersection for this report finally stepped into the roadway to force traffic to yield to allow the student to cross.

The motorist below—like most entering from Garden—strains forward and pulls into the crossing to judge oncoming traffic, then hurries across.

A The existing intersection configuration is daunting and complex. Drivers, bicyclists and pedestrians alike have difficulty navigating it.

As seen in the aerial images to the right, the intersection of Center and Garden is very wide. With multiple lanes, the intersection hosts a high number of conflict points where the paths of vehicles and people cross each other.

Additionally, the overly wide intersection makes for long pedestrian crossings.

- A person crossing Center on the southwest side of Garden must travel about 65 feet to the island and another 18 feet to the sidewalk. Applying a standard crossing rate of 3.5 feet per second, it will take a pedestrian almost 24 seconds to cross here; that is 24 seconds the person is in the roadway and exposed to the threat of being hit.
- Crossing Garden along the northwest side of Center is 60 feet to the island, and another 27 feet to the sidewalk. A person walking at a standard rate would be exposed for almost 25 seconds here.

Local leaders and residents identified this intersection as a particular concern during the October walking audit, with some participants indicating they avoid this area altogether during school travel periods.

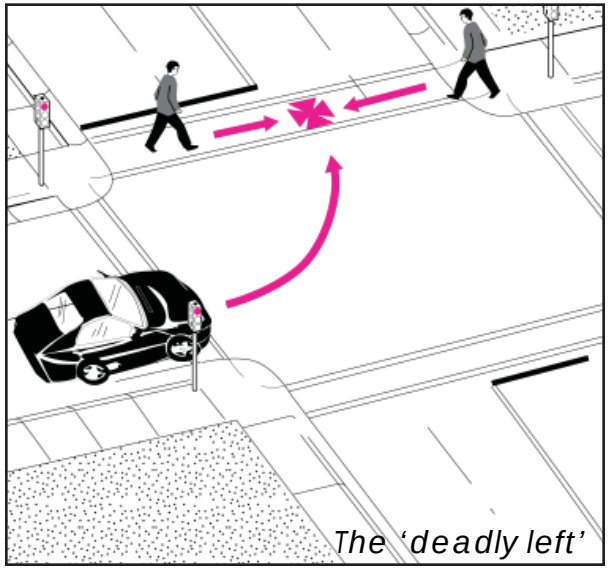
A WALC Institute team member observed traffic at the intersection during morning school arrival period the morning of the October walking audit. Of great concern was the po-

In the image to the left, from Google Earth, and the image below, captured by the WALC Institute team in Oct. 2013, it's easy to see that the wide intersection creates long crossing distances for pedestrians, putting them at greater risk of being hit. The intersection complexity makes it more dangerous for people driving, as well.

The dark tire marks also indicate a high number of right turns from Center onto Garden. Thus, if considering a modern roundabout for this intersection, it will be important to study whether channelized right-turn lanes with "pork-chop islands" are needed to help traffic flow more smoothly and people cross safely.

tential for a vehicle to make "the deadly left," a crash that occurs when a driver trying to turn left is focused on judging the speed and spacing of oncoming traffic, shoots a gap to make the left turn, and hits a pedestrian in the crossing (see image below.) The pedestrian may not even see the car before it hits them.

An ideal long-term solution—for both safety and placemaking value—may be a single-lane roundabout. In the interim, temporary and low-cost treatments such as restriping to narrow the lanes on Garden, building curb extensions with planters or bollards, and removing the outer southwest-bound lane on Center could make the intersection more compact and more comfortable for all.



The 'deadly left'

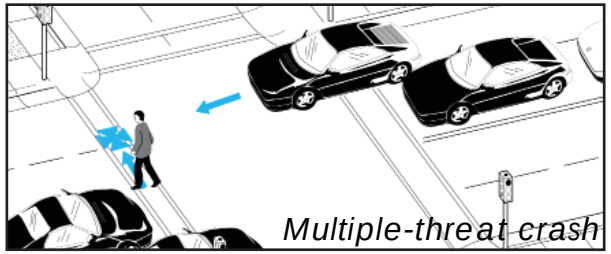
Below, although Garden in each direction is marked as a single lane heading into the intersection, vehicles use the excess space in the lane like a right-turn lane, adding to the intersection complexity and increasing the number of vehicle paths that pedestrians must cross to get across the street.

At the intersection, Center is wide, with:

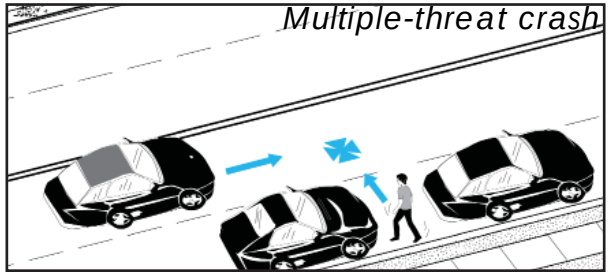
- *two through lanes heading southwest (toward the hill)*
- *a left turn lane on each approach*
- *channelized right turn lanes on each approach*

The number of lanes creates multiple "conflict" points, where the paths of various roadway users cross each other.

A mid-term fix for the intersection could be to reduce the number of lanes that enter the intersection, which would help reduce the number of conflict points and the risk of "multiple-threat crashes." As depicted in the images below, a multiple-threat crash occurs when one car yields but the car in the adjacent lane doesn't. Images courtesy www.bicyclinginfo.org.



Multiple-threat crash



Multiple-threat crash

A

Modern roundabouts are much safer than signals.

Done well, they also are easier and more comfortable for people walking and biking.

The modern roundabout is deemed by the U. S. Dept. of Transportation and other agencies to be a “proven safety countermeasure” because it reduces the number and severity of crashes when compared to a signalized intersection. Roundabouts also help create a sense of place and are less expensive to operate than signalized intersections. Due to its importance in connecting people to places, and its current complexity, the intersection of Center and Garden may be an ideal location for a roundabout.

Traffic volumes at Center and Garden likely warrant only a single-lane roundabout, which might fit within the existing right-of-way. Design details are important; ensure it is done by an engineer experienced with modern, single-lane roundabouts that are traffic-calming and placemaking tools. See the appendix for more about modern roundabouts. In the short-term, consider at least reducing the number of lanes on approach to the intersection to reduce the risk of multiple-threat crashes.

The modern roundabout above, in Olympia, WA, is on a sloped street, like Center, and serves as a traffic-calming gateway into an important part of town.

Envision, from this...

The intersection at Center and Garden in New Ulm serves as a crucial connector, but is difficult to cross as a pedestrian and makes drivers nervous. This intersection can be transformed to be a people-friendly place with a modern tool like a roundabout.

to this.

This single-lane roundabout in San Diego carries about 25,000 vehicles per day, far more than the volume of Center, while enhancing safety for all. Pedestrians cross only one lane at a time, and drivers yield appropriately due to lower vehicle speeds.

Case Study: Making the Case for Roundabouts in Bend, OR

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As roundabouts become increasingly popular, a growing number of local and state officials are discovering how challenging it is to educate the public and ease concerns among those driving large vehicles about whether they'll be able to pass through an intersection that has one.

The city of Bend, OR, has a long history with roundabouts, having installed its first one in 1999. It was a developer named Mike Hollern who persuaded the city council to approve the first one, showing them slides and a home video that demonstrated how they work in Europe. For Bend City Council members, it was a traffic management approach that made sense, and they moved quickly to institutionalize roundabouts once they saw how well they worked. The city council adopted a "Roundabouts First" policy the very next year, requiring city staff to always consider a roundabout first unless they can convince the city council that it won't work at a given intersection. Today this city of 80,000 has 31 roundabouts, with four more in design, including some located by schools. There is a single-lane roundabout at NE 8th Street and NE Franklin Avenue by Bend High School, for example, and just down the road, another roundabout sits next to Bear Creek Elementary.

Single-lane roundabout near the high school in Bend, OR

Using Education to Build Acceptance

In Bend, education has always played a critical role in successfully implementing roundabouts, whether for the purpose of teaching people -- including children -- how to navigate them safely or for demonstrating their track record on the safe and efficient movement of traffic. All relevant city staff went through a formal training process once the "Roundabouts First" policy was adopted. The transportation engineers worked first with police, firefighters and maintenance teams because it was important to get them on board. They did some high-level planning related to response times, queuing, etc., and tweaked their designs accordingly, always trying to match the roundabout to its environment or context. They met with city administrative staff, since they would receive many of the citizen questions or complaints. The city hosted free, full-day events for all of the designers in town, bringing in national experts to train them on roundabout design. And finally, they took the same training to community groups and neighborhood associations and developed extensive educational materials.

Outcomes

The result of Bend's methodical approach to introducing roundabouts is a general comfort level on the part of the public and a consistent track record on how well designed they are for the context and traffic counts. Jeff Monson is executive director of Commute Options, a local nonprofit that promotes active transportation, and he's worked with many kids to train them on how to navigate a roundabout. He's been struck by how safe it feels in Bend even when he's bicycling with kids. "The roundabouts are great," he said. "You can travel the whole way through town without stopping, and you never feel nervous." Monson talks up another feature of Bend's roundabouts as well, and it's an effective placemaking tool that other communities might want to look into: Every one of them features public art funded by Art in Public Places, a local nonprofit.

B Create and Enforce a School Arrival/Departure Process

Utilize best practices in Safe Routes to School planning

Walking and biking to school not only improves health, but also boosts home values and actually helps improve academic scores. (See the appendix for more information about Safe Routes to School.)

New Ulm should be commended for keeping Jefferson Elementary and New Ulm High located within or near neighborhoods. This allows more families to use active transportation to and from school, as seen in images to the right.

However, arrival and departure at the joint campus of Jefferson Elementary School and New Ulm High School can be made safer, more supportive of active transportation and more organized by applying best practices in Safe Routes to School planning.

The specific recommendations that follow are informed by the following guiding principles:

1. A student who lives close enough to walk or bike to school should be given an environment in which it's safe to do so, and should be supported through encouragement and education.
2. To enhance safety, it is ideal to separate the modes of arrival—bus, car and active modes—from each other, to the extent possible.

Existing conditions

New Ulm is to be commended for keeping these schools located within neighborhoods, which allows more families to use active transportation to and from school, above. Below, crossing guards were observed to do a good job of stopping traffic appropriately and helping students cross. Right: Children are naturally inclined to move; their need for physical activity should be met.

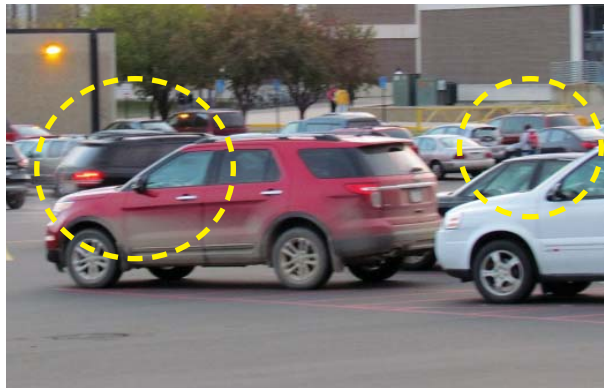
B Existing conditions

Currently, school arrival and departure practices at the joint campus create conflicts between children—including those who are very young—and cars and buses. This is observed along S. Garden, in the back parking lot, and on Payne. These conflicts are serious enough that they warrant documentation; thus, this page and the following page are dedicated to images primarily illustrating the issues.

It is important to note that the students in these images are behaving very naturally for their ages. The responsibility lies on us to create environments that keep them safer; to educate the entire school community, including students, parents and faculty, about safe practices; and to enforce programs that enhance safety and the ability of students to use active modes of transportation.

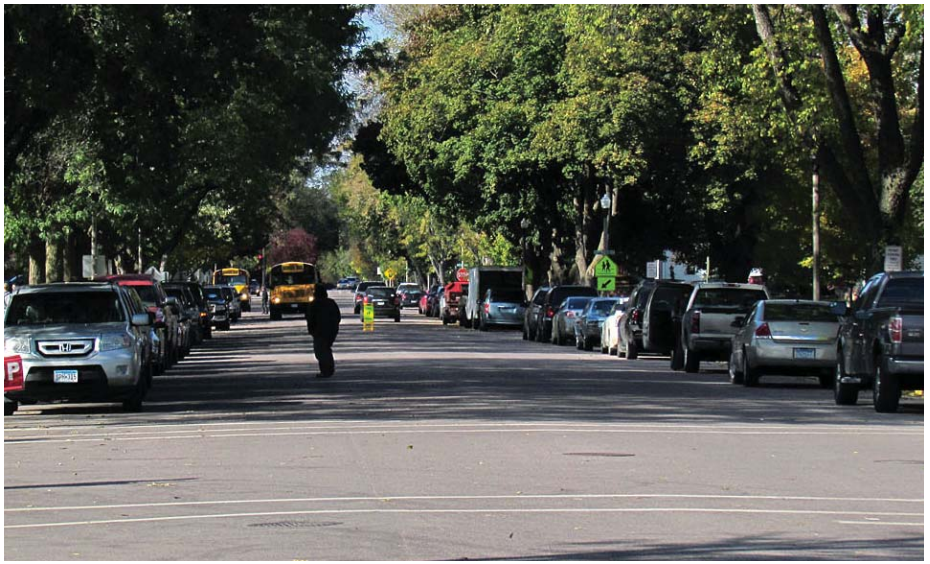
To help improve safety, increase physical activ-

The scene above, in the back-lot driveway, reflects a dangerous combination of students in a driveway and teens behind the wheel. In fact, teen drivers have more crashes than any other age group, and driveways are a leading location for child injuries. Another confusing scene that plays out repeatedly during the arrival period is captured in the images below, with focus in this series on the black vehicle. (1) The vehicle pulls into the back lot to drop off an elementary-age child; the drop-off spaces are marked for buses, and thus don't provide adequate guidance to car drivers about where to pass, how far to pull forward or how far to back up. (3) The vehicle must back into moving traffic to leave the drop-off spot. Then, (3) the vehicle travels across the parking lot to the furthest exit, creating added conflicts with high-school students who have parked in the lot and are walking to the campus.



B

Above: Buses pass through the back parking lot and along the driveway through campus, and are positioned in three different places on campus during departure time. Below left, some parents park along S. Garden to pick up their elementary students. Below right, on Payne Street, cars pull in and out of parking spaces during the arrival and departure periods. Also, note the parent crossing the street mid-block, outside any designated crosswalk.



B Separate the Modes of Travel

ity and give more New Ulm families a choice in how their children get to and from school, consider the following recommendations for Safe Routes to School (SRTS).

Separate the modes of travel

Separating students arriving by walking and biking from those arriving by car and bus just makes sense. But it's also a national best practice. According to the National Center for Safe Routes to School, "Provision of sidewalks and bikeways which are separate from lanes dedicated to buses and lanes dedicated to motor vehicles will reduce a student's exposure to traffic. Students walking or riding to school should not have to cross busy driveways or roadways to access the campus." For more information on why and how to separate the modes of arrival and departure, visit the SRTS National Center online and read the SRTS Guide at http://guide.saferoutesinfo.org/index.cfm.

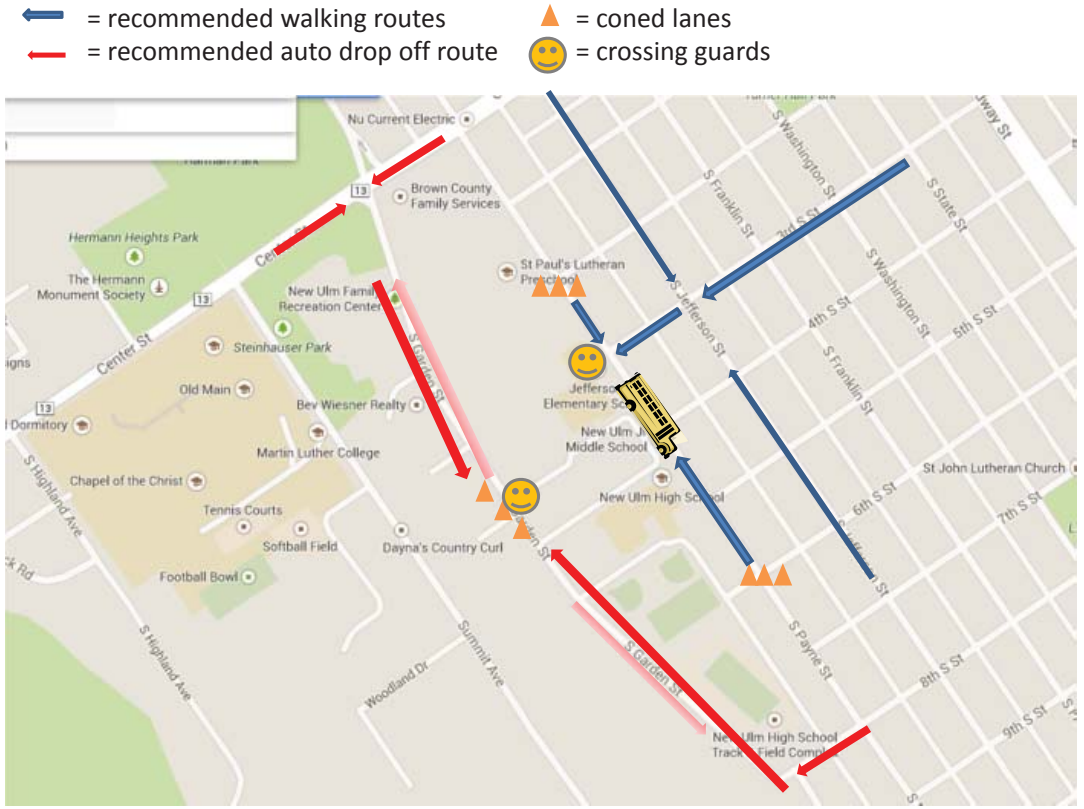
The elementary and high school campus is served by two primary streets, Payne Street and S. Garden, which could provide the ideal means for separating the modes of travel.

Payne St. should be for walkers and bikers

Payne between 2nd and 6th should be a designated Walk Zone, an area accepted as the primary cross-street to and from the schools for students walking and bicycling. This is appropriate because the majority of residences appear to be on the Payne side--north, east and southeast--of the schools.

South Garden St. should be for drivers

There are relatively few homes on S. Garden between Center and 8th. This means that routing car traffic on S. Garden presents the least amount of potential conflicts with pedestrians/residents, compared to Payne St. Also, high-school drivers already will be using S. Garden to park in the back lot.



B

Buses should stay off campus if possible

It would be best for buses to stay outside the campus. If there is relatively little busing, the buses can use the west side of Payne; this is preferable so students don't have to cross Payne to get onto school property. However, if the primary crosswalk is calm and controlled, and parents comply with the new process of car traffic using S. Garden, the buses could use the east side of Payne and allow students to cross Payne--with crossing guard assistance--to school. An added bonus of having the buses use Payne is that it allows them to be separated from car arrival and departure. If the number of buses would create significant conflicts between students and buses on Payne, consider a remote drop-off program that has students walk a block or two to a bus area. In this case, students with special needs would still need to be bused directly to school.

Add crossing guards

Crossing guards should be positioned on S. Garden and Payne at the primary crossings, to be determined after enhanced crossings are installed, but most likely at 3rd and Payne, and at S. Garden and the Jefferson driveway. Current crossing guard locations should remain until primary crossings are determined and built, and a visual survey verifies the crossings that have the largest number of students.

Use traffic cones to help enforce the system

Traffic cones should be used to enforce car arrival and departure rules at primary street crossings and car drop-off/pick-up zones. Staff, volunteers or crossing guards can be utilized to place and remove cones. Multiple cars pull into the coned zone at a time, they drop off or pick up their passengers, and then they pull forward as a platoon and others enter behind them. This maintains an orderly process.

Cars and buses dropping off students should not use parking lots and driveways. This not only reduces the potential for conflicts, but also leaves parking spaces available for visitors, staff, and high school parking.

Conduct outreach

Clearly, these changes will require a robust education and enforcement program. Consult www.saferoutesinfo.org for additional guidance. Also, see the next page for starter ideas for a phased plan.

In the images to the right, cones keep cars moving in an orderly manner in Norwood, CA, and a combination of adult volunteers, staff and student safety patrol guide drivers and open doors for students. The cars pull forward into the drop-off zone six to ten at a time, students exit their vehicles, and the cars then continue forward in a single line to exit the drop-off lane, allowing the next cars to pull forward into the drop-off zone.

B

Enhance crossings

Use curb extensions and high-emphasis markings to enhance all crossings near the schools.

Above, participants in the Complete Streets and Walkability Workshop form a "human curb extension" on Payne to illustrate how a real curb extension reduces crossing distances, calms traffic and makes crossings safer. Below, high-emphasis crosswalk markings are important near schools.

Reduce risk where the on-campus driveway crosses the sidewalk and crosswalk

At the on-campus driveway that runs behind the elementary school and that flows across the sidewalk and into the crosswalk, install removable bollards that will help reinforce the space as being for pedestrians first, and delivery vehicles second. A delivery driver can either be assisted or can get out to remove the bollards before proceeding on the driveway through the crosswalk and sidewalk. Either way, drivers should be forced to proceed very cautiously here.

This crosswalk on the elementary campus directs walkers into an active driveway for delivery vehicles. To minimize the risk of a crash, install removable bollards that allow pedestrians to pass easily but require drivers to be assisted or to stop their vehicles to remove the bollards. Either way, drivers should be forced to proceed very cautiously in this space.

Create a phased plan

The phased plan below provides a good starting point.

Phase 1

- Determine new arrival/departure plan, such as primary crossings, car/bus routing
- Begin utilizing cones to funnel car traffic
- Add crossing guards
- Outreach/promotion campaign to educate parents and students on new routing
- Meet with city/district to determine long-range plan, funding, policy, infrastructure

Phase 2 (Spring 2014?)

- Host one day promotional event, such as Bike to School Day in May
- Develop school team to determine SRTS program elements and plan for fall launch
- Launch remote drop-off /pick-up program?
- Outreach/promotion campaign on some completed infrastructure treatments?

Phase 3 (Fall 2014)

- Launch SRTS program (walking school buses, safety education, etc.)
- Host one day promotional event to launch SRTS program, such as Walk to School Day
- Infrastructure treatments completed?
- Final arrival/departure plan implemented.
- School zone speed education campaign

Case Study: Longmont, CO Students SOAR and Reduce Traffic

Excerpted from the National Center for Safe Routes to School

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In less than a year, a nearly 40 percent reduction in motor vehicle traffic resulted at Eagle Crest Elementary School when students and parents embraced the school's Safe Routes to School program and chose to SOAR, or Step Often and Ride to school.

"There are no cars waiting to drop students off," says Physical Education Teacher Jason Goldsberry, who is the school's SRTS coordinator. "It almost seems like a ghost town."

In the 2004-2005 school year, 75 percent of Eagle Crest's 650 students arrived at school by motor vehicle. The number declined slightly when the fifth grade was temporarily moved to the middle school, but even then, 60 percent of the students continued to arrive by motor vehicle. In the mornings before school, even the principal helped direct traffic, says Buzz Feldman, Longmont SRTS Coordinator and owner of High Gear Cyclery.

Over the course of one year, this safe-routes-to-school program reduced vehicle traffic by 40 percent.

The Program

Longmont was awarded a two-year grant of just under $75,000 from the Colorado Dept. of Transportation that was designated for programs at five schools, including Eagle Crest. Before the school's non-infrastructure encouragement and education program began, students and parents responded to a survey that documented how they arrived at school, Feldman says. Next, a school-wide marketing effort began with fifth-grade students creating posters to inform students about SOAR's environmental and health benefits and to encourage participation. Students were taught how to bicycle and walk to school safely.

The school also used a solar-powered counter to record student bicycle trips to school using a tag attached to each child's bicycle helmet or backpack. Funds were used to purchase motivational prizes.

The resulting increase in participation led the school's PTO to purchase three additional bicycle racks. An added benefit has been the family time that results from parents walking or bicycling to school with their children. "We have great community buy-in," Goldsberry notes. "It's become a habit: even in snow and rain, kids SOAR to school."

Outcomes

With a current student population of 450, fewer than 100 motor vehicles pass through the school drop-off each morning. Prior to the SOAR program, motor vehicle transportation accounted for 60 percent of trips to school.

Even in mid-January in cold temperatures, 76 bicycles were parked outside the school.

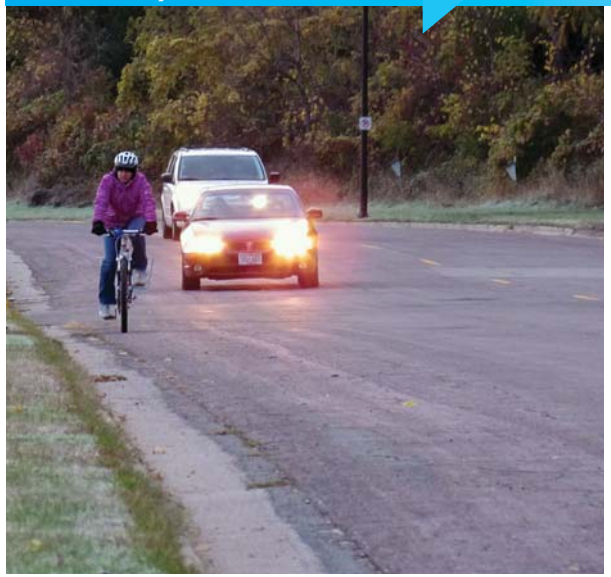
Bicycle racks are full, and even in mid-January 2009 in cold temperatures, 76 bicycles were parked outside the school. The average length of trips to school is one mile for Eagle Crest students, and students have nearly circled the globe with their mileage totals. "We've got parents involved. They love the sense of community it's created," Feldman says. "Now, regardless of weather, we're not seeing the car traffic."

C Redesign South Garden Street Behind the School

Provide better support for all roadway users, including people walking, biking and driving

S. Garden from Center to 8th S. St. presents an opportunity to reallocate roadway space to better support all people. Currently, cars are given as much as 43 feet, curb-to-curb, with some sections appearing to be 40 feet. Consider installing on-street parking along the school side the entire length of the corridor, narrowing the vehicle lanes to 10 feet each, moving the center line, and installing bike lanes on both sides of the street. This will help calm traffic, provide better access for bicyclists and allow for narrower mid-block crossings for pedestrians. The concept below illustrates these dimensions as starter ideas. Bike lanes must be at least five feet, but are ideally wider, especially alongside parking where bicyclists need extra space to avoid car doors.

Envision, from this...



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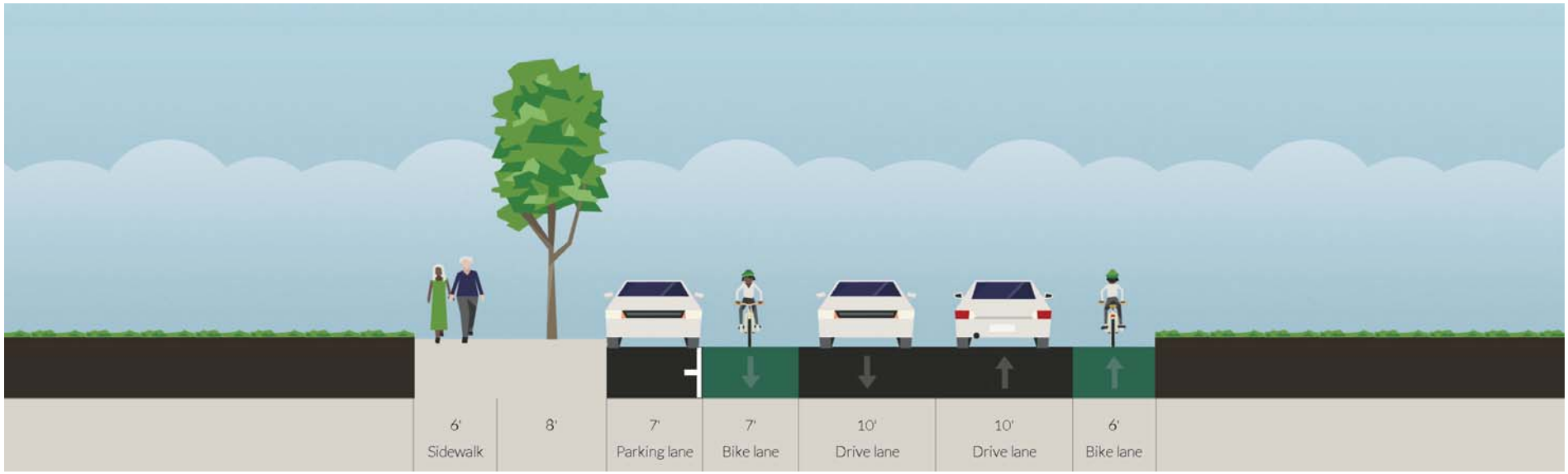
Davis, CA



C Consider street transformations like these from Fairhope, AL

Leaders in Fairhope, AL decided in 2012 to reallocate existing right-of-way to better support all roadway users, including people walking and biking. They narrowed the vehicle travel lanes to 9 feet each and eliminated the center line except on approach to intersections, a move to further calm traffic. They kept on-street parking and added bike lanes where possible, or "sharrows" where bike lanes wouldn't fit. In some places, the narrower vehicle lanes left wide shoulders that serve now as buffers between people walking on sidewalks and vehicles passing.

In Fairhope, AL, leaders re-striped streets to narrow the vehicle travel lanes, add bike lanes and keep on-street parking. The effect is calmer traffic and better support for all roadway users, including people walking, biking and driving. Below left, "sharrows" were added where the existing right-of-way wasn't wide enough for bike lanes. On some streets, right, the narrower lanes leave wide shoulders that serve a buffer between the sidewalk and the travel lane.

In conjunction with its restriping effort, Fairhope painted new, high-emphasis crosswalk markings, below.

D Build New Mid-Block Crossings on South Garden Street

Help people get safely across the street near the recreation center and schools

S. Garden is an incredibly important street that connects people to the recreation center, the schools, the county services building, and more.

Two existing mid-block crossings on S. Garden don't do enough to support the community members who walk along this stretch—or, who would walk along this stretch if they felt more safe and comfortable in doing so.

The overly wide road and visually diminutive crosswalk markings give drivers very little cue that they should expect to yield to people here. Also, the crosswalks are about 43 feet across; for people crossing at a standard rate of 3.5 feet per second, they'll be in the path of cars for more than 12 seconds, longer than necessary.

These mid-block crossings also could impact how pedestrians navigate the daunting intersection of Garden and Center (seen in the photo the right—taken walking down the hill during school arrival time in October—when it's dark and cold.) Until a long-term solution is applied here, good mid-block crossings on S. Garden will allow people walking down the hill to more easily access the schools; instead of crossing S. Garden along Center, they could cross more safely at a good mid-block crossing.

Existing conditions

S. Garden is an incredibly important street, connecting people to the recreation center, schools and more.

This crosswalk provides very little cue to drivers that they should expect to yield to people crossing here.

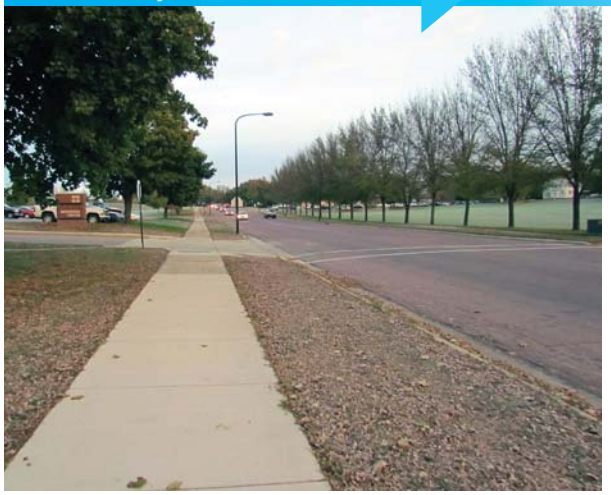
A better mid-block crossing on S. Garden will help some avoid crossing at the daunting Garden/Center junction, shown here at morning school arrival time, still dark.

During the walking audit, participants noted the lack of support for pedestrians trying to access the recreation center.

D Reallocate space within the existing right-of-way to provide better mid-block crossings.

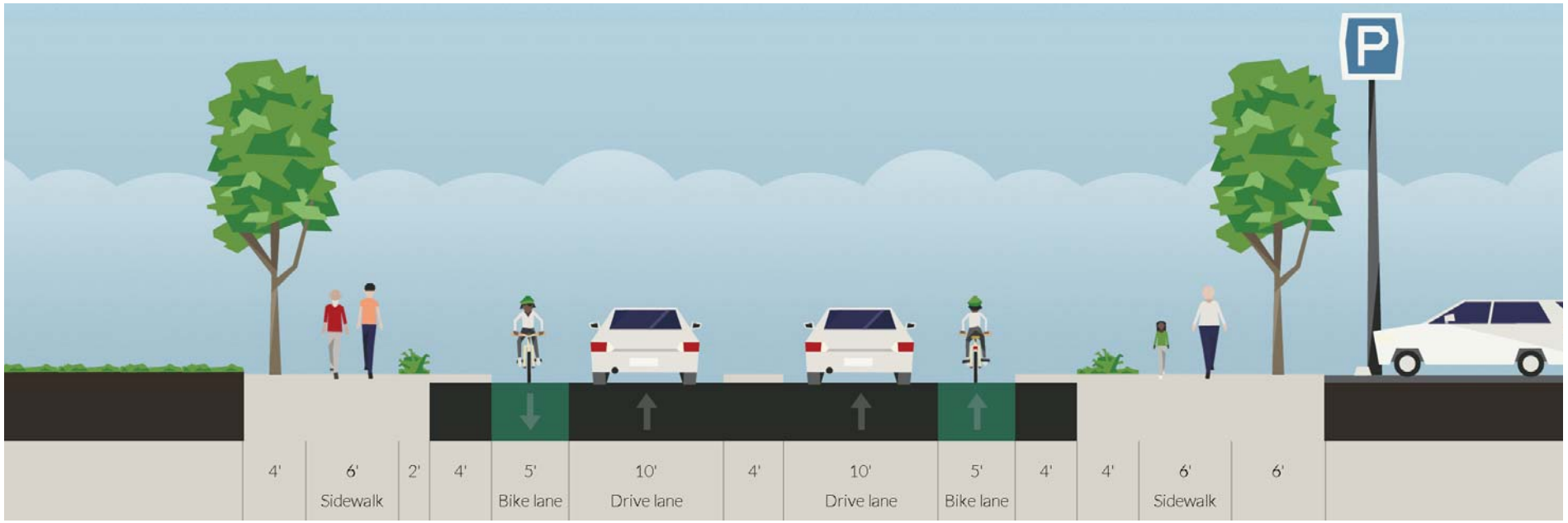
Currently, S. Garden is about 43 feet across, curb-to-curb, which is plenty of space for better mid-block crossings that include curb extensions, crossing islands and a continuation of the bike lanes proposed on S. Garden. The concept below provides starter ideas for dimensions that could work well. Note that although street parking is proposed for the entire east side of S. Garden, parking spaces shouldn't be placed within 20 feet of the mid-block crossings. Build these crossings at the recreation center and schools. See the following pages for more information about the key elements of a better mid-block crossing.

Envision, from this...



to this.

Bellevue, WA



D Use curb extensions, a crossing island, signage, a raised crossing table and high-emphasis markings to create a safer, shorter mid-block crossing.

A high-quality mid-block crossing on S. Garden should incorporate as many of the following treatments as possible.

Curb extensions

Also called "bump outs," curb extensions visually narrow the street, which encourages drivers to slow down, and minimize the crossing distance, which keeps people in the path of vehicles for as short a time as possible. Inexpensive or temporary options as shown in the bottom images include planters and rubber bumps.

Golden, CO

Crossing island with a 'Z' design, or angled walkway

Crossing islands provide pedestrians a safe refuge and reduce the distance they must cross at one time. Angle the walkway through the island to position the pedestrian to face oncoming traffic. In combination with curb extensions, crossing islands can reduce crossing distances to eight feet at a time.

Kailua Town, HI

D

A raised table

Especially near schools, it can be helpful for crossings to be raised in order to make people—like youngsters—more visible. The raised table also serves to slow vehicles down to safer speeds. Where snow is common, the table can be sloped to accommodate snow plows.

Signage and high-emphasis markings

A best practice in signage for mid-block crossings is to ensure drivers see signs on both sides of the street as they approach. Also, the crossing itself should have high-emphasis markings such as those shown below and to the right.


Boulder, CO


Millilani, HI

Photo-vision for ideal signage


Charlotte, NC


Golden, CO

Boulder, CO

Contact
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City of Asheville Transportation Department
(828) 259-5943 or kputnam@ashevillenc.gov

In the mid-2000s, the city of Asheville, NC transformed a key stretch of College Street, the major artery through downtown, from an overly wide thoroughfare dominated by cars into a street that today works just as well for pedestrians, bicyclists and transit users.

Traffic engineers added bike lanes and on-street parking, and widened the sidewalks to create safer conditions.

While Asheville ended up spending nearly $450,000 on the project, the city had already planned to resurface the road and saw the additional incremental costs as a good return on that investment. Engineers added bike lanes and on-street parking, and widened the sidewalks to create safer conditions for walking and biking, all within the existing right of way.

Challenges and Goals

In 2005, College Street was Asheville's widest road at 76 feet. It had two lanes running in each direction and additional turning lanes at the intersections, where pedestrians had to cross up to seven lanes. Mid-block crossings presented another challenge. The road had the highest-volume uncontrolled crosswalks in the city, with one or two pedestrians getting hit every year.

College Street's design invited high speeds and worked against the city's goal of promoting walking, biking and transit. It also represented a missed opportunity to create an attractive gateway to downtown with a lively streetscape and sense of place. The road also had a lot of excess capacity, having once served as U.S. Route 70 before losing most of its traffic to Interstate 240 when it opened on a parallel route. Traffic counts on College Street were 90 percent higher in 1954 than they were 50 years later in 2004, when the road carried just 13,000 vehicles a day.

Asheville's Complete Streets Solutions

The excess capacity made College Street an ideal candidate for a "road diet," leading the city to reduce vehicle lanes in favor of improving the experience of pedestrians and cyclists. Ultimately, Asheville narrowed a stretch of road that once spanned four lanes into just two lanes divided by a landscaped median. That created room for bike lanes, on-street angled parking, bold, ladder-style crosswalks and "pedestrian refuge islands" to make mid-block crossings safer.

This "complete street" in Asheville, NC reflects opportunities for S. Garden St. in New Ulm. Utilizing existing right-of-way, S. Garden can still move traffic while better supporting all roadway users.

A crossing in Asheville, NC similar to a mid-block crossing recommended for S. Garden in New Ulm.

Asheville also replaced the signalized intersection at Oak and Valley Streets with a single-lane roundabout that moves traffic at a safer, continuous pace and provides safer pedestrian crossings. The roundabout has helped turn College Street into a newly vibrant gateway into downtown.

> *City staff witness vehicles stopping more readily at crosswalks to yield to pedestrians, who are more visible as they cross in greater numbers.*

The city has also made progress with smaller, low-cost steps such as Central Avenue, where new painted "sharrows," or shared-use arrows, alert motorists that bikes and cars share the same lane.

Asheville formalized its goal of ensuring that road projects consider all users with the adoption of a Complete Streets policy in the summer of 2012. In 2014, planners will consider that policy alongside the city's bicycle, pedestrian, greenways and transit plans to develop a comprehensive multi-modal transportation plan.

Outcomes

Crashes at the location of the roundabout have been less severe -- largely fender benders -- and pedestrians face far fewer potential conflicts with motor vehicles at the intersection, which provides much shorter crossing distances. City staff witness vehicles stopping more readily at crosswalks to yield to pedestrians, who are more visible as they cross in greater numbers. And traffic is moving more smoothly through the corridor, which is attracting infill development.

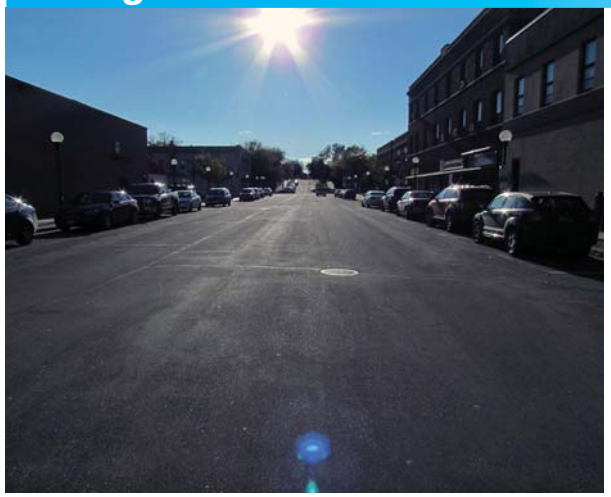
E Revitalize Downtown

Ensure people know they're arriving someplace special when they reach downtown

Downtown New Ulm has good "bones" and provides a solid foundation for future growth and prosperity. The street grid is intact, with compact, walkable blocks. Buildings "front" the street, which helps create a pedestrian scale and sense of enclosure. Many building facades have been restored in a manner that celebrates downtown New Ulm's historic beauty.

The opportunities for becoming more walkable and prosperous in this area center around creating gateway entrances to downtown, moving traffic in a more calm manner and enhancing the experience for people arriving by all modes of travel.

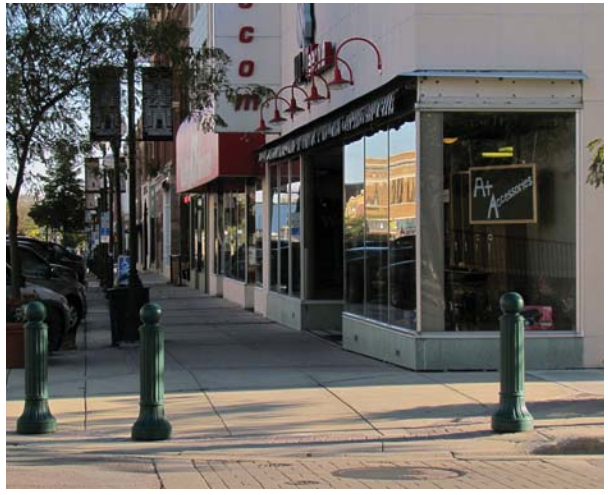
Existing conditions



Some downtown streets seem to be overly wide, whereas others are one-way without apparent need.

Restored facades appropriately celebrate New Ulm's historic beauty.

Some alley spaces in downtown New Ulm are partially utilized for outdoor dining. Opportunities like this that aren't maximized come across as missing teeth.



For the most part, the pedestrian realm is very pleasant in downtown New Ulm. This is something to build upon and leverage for maximum economic prosperity.

Unfortunately, there isn't much in place to signal one's arrival in the downtown area.

E The best downtowns create a sense of arrival

Convert prime intersections to gateway entrances

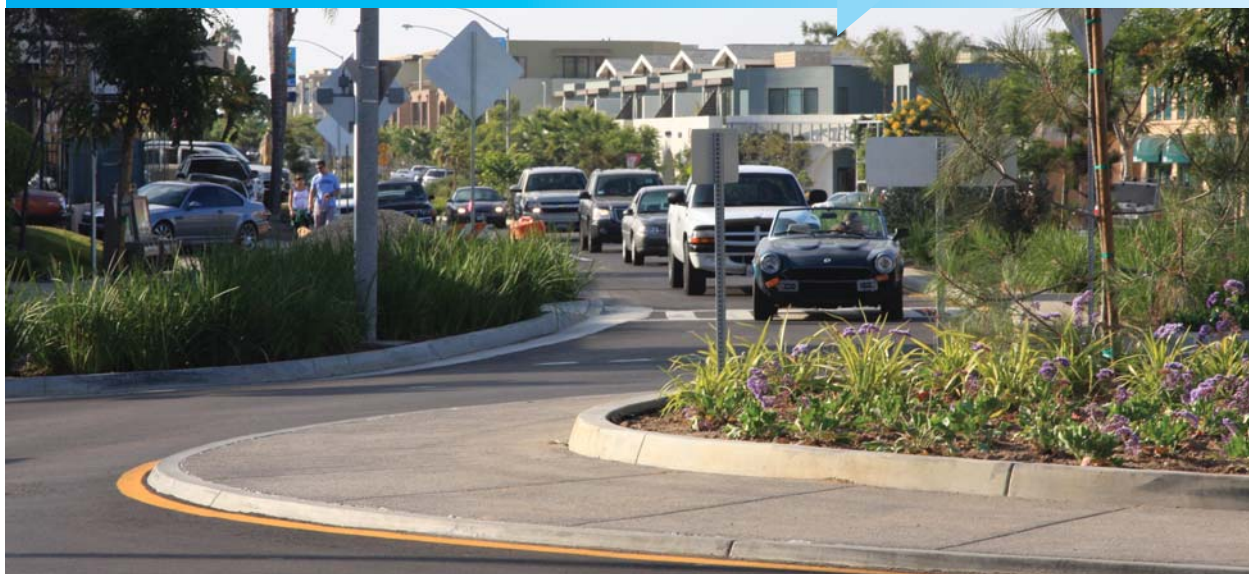
People like to feel a sense of arrival upon reaching a downtown or town center. Currently, for all its strengths, New Ulm doesn't offer that sense of arrival. In fact, wide streets are more likely to give visitors the sense the downtown features more auto-dominated streets.

Counter this, and create a sense of place, by converting a key intersection to serve as a gateway entrance to downtown. Center and Broadway would make an ideal location; alternatively, Center and Minnesota also would make for a good location for a gateway.

In the image to the bottom right, a series of modern roundabouts serve as a gateway into the commercial district of Bird Rock in San Diego, CA. Below, a change in surface, a pavilion and angled parking mark entry to downtown Winter Garden, FL.

Envision from this...

to this.



E Downtown shouldn't be a place to speed through

Allow "parklets" downtown

A parklet serves as an extension of the sidewalk and allows for uses such as dining. The parklet often extends into the street. Of course, the street must be traffic-calmed in order for this to be allowed, but parklets enhance the vitality of downtown areas.

Update code to encourage mixed uses, downtown housing

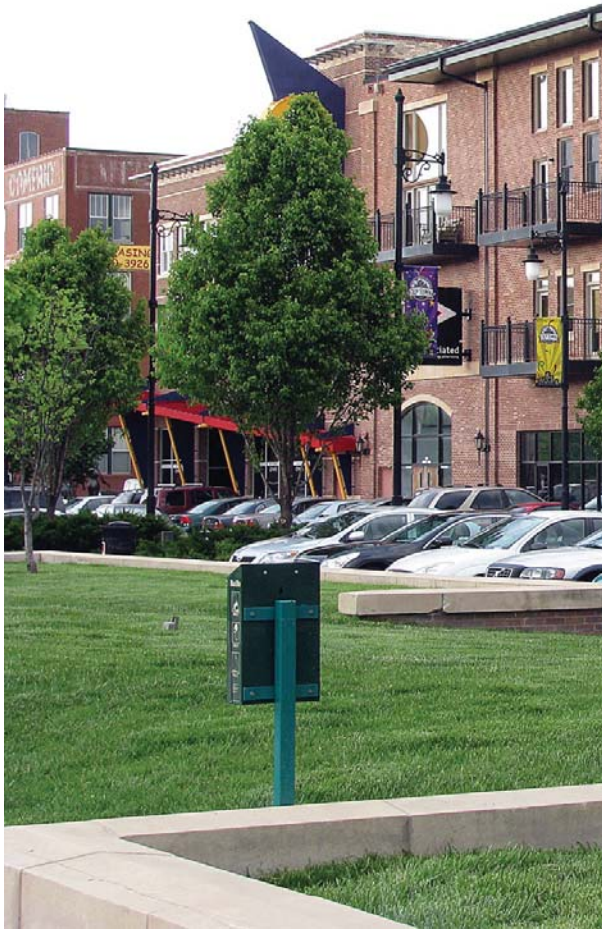
City code should support and encourage more mixed uses in the downtown area, including apartments, flats and other types of housing stock.

Convert Minnesota to a bike boulevard with a 20-mph speed limit

A bike boulevard is a street with low vehicle speeds that makes special accommodations for bicyclists. With the businesses already located along Minnesota, it is an ideal street for a bike boulevard. The boulevard also enhances the trail network and connectivity. In the short term, at least lower the posted speed limit on Minnesota and all downtown streets to 20 mph.

A parklet in San Francisco, CA. Image courtesy www.sfplanning.org.

A mixed-use infill project in Eugene, OR.

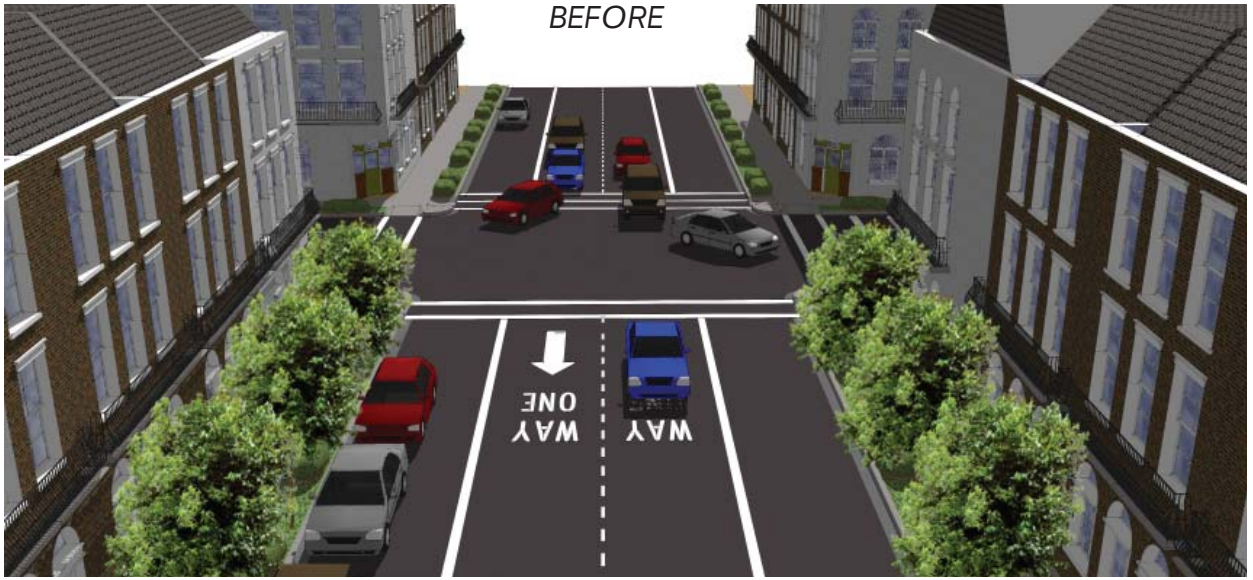


Mixed-use development in Wichita, KS.

E Two-way streets are more conducive to commerce

Restore two-way traffic to downtown streets.

One-way streets move cars at fast speeds, are not customer-friendly, and should be removed from most downtowns. One-way street grids cause "dead blocks" that require circuitous routing to arrive at a destination. A two-way downtown grid allows for simple design and navigation for drivers. Narrowing the lanes can also help calm traffic and add important buffer space between cars and people walking or biking.



Two-way streets like this one in New Ulm are preferred, especially in downtown settings.

F Add Bike Trail Connections

New Ulm's investment in bike trails must now be maximized; create connections into town

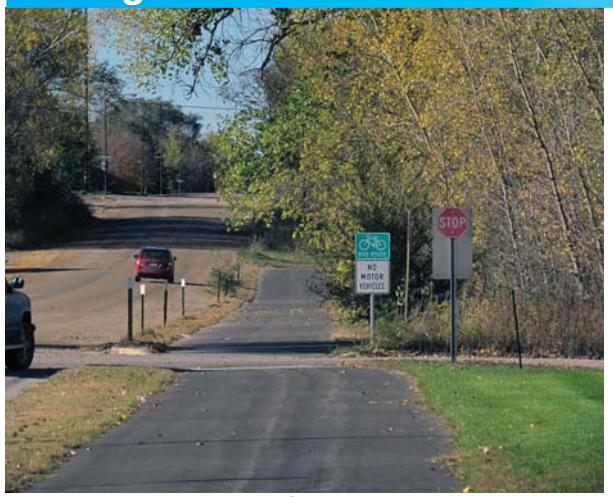
New Ulm has made great progress in building a near-complete circuit of bike trails circling the town. These trails are an investment not only in a healthier future, but also in economic prosperity and social equity.

The next step must now be to connect those trails through and into town, especially to provide access to schools, medical centers, civic assets and the downtown area.

In time, trails that connect through town as seen in the conceptual plan to the right may need to be separated trails. But in the short-term, the city can notch a quick win by marking existing pavement with bike lanes where streets are wide enough, and with "sharrows" where appropriate. Also, install large, consistent bike route signage on the existing on-road sections, so the route becomes immediately better recognized.

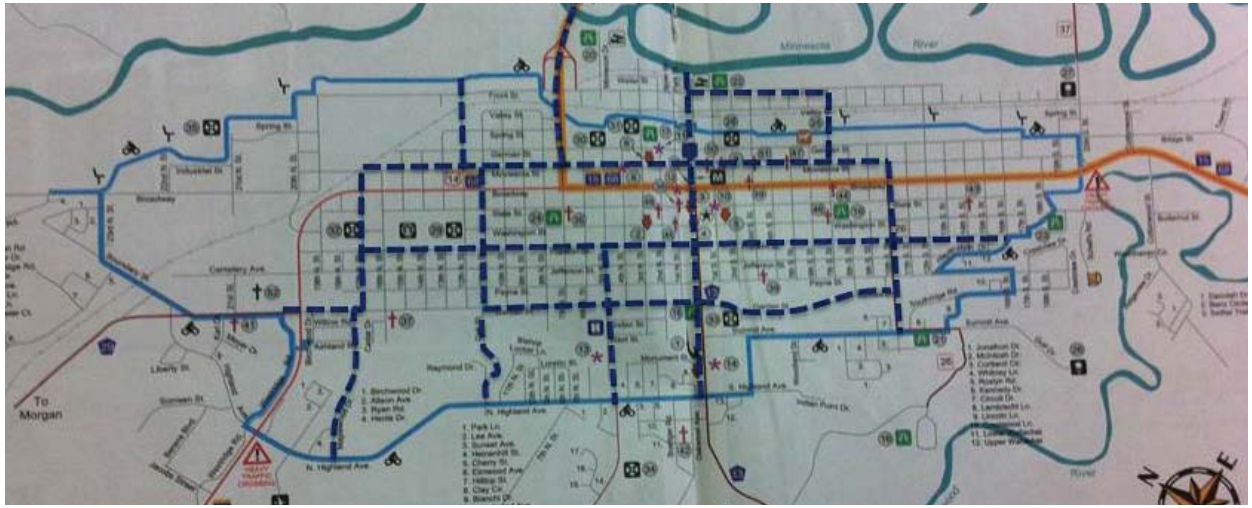
And where trails cross streets, enhance the crossings with high-emphasis markings. Where bicyclists may be expected to wait for gaps in traffic, install rails on which cyclists can lean while they wait.

Existing conditions



A near-complete circuit of trails circles New Ulm. Now it's time to connect the trails into the town.

Where trails and streets intersect, crossings should be better marked.



During the Complete Streets and Walkability Workshop, the project team recommended trail connections like those in the dashed blue lines above. Even with connections that are simple pavement markings, not necessarily separated trails, people will be able to more easily connect to important places—such as downtown and schools—by bicycle.

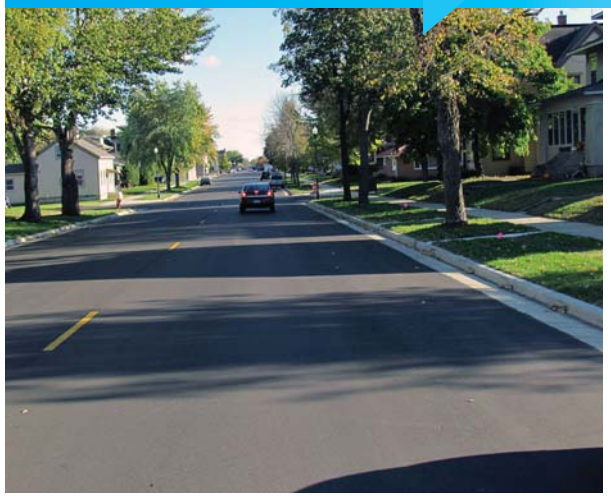
F Connect the trails through and into town.

Additionally:

- Work with Target to mark a formal trail connection through the store's parking lot to 20th Street S.
- Ensure bicycle and pedestrian access is included in any new projects, such as the impending rebuild of the 14/15 bridge. This is a key east-west link for the trail network.
- Snowplow or otherwise groom the trails to keep them operational as many weeks out of the year as possible.

There are more than 20 benefits of bike lanes. Only a few of them are for bicyclists. Read more in the appendix.

Envision from this...



Many streets in New Ulm are wide enough to add bike lanes by simply painting the markings.

to this.

This bike lane in Orlando, FL encourages active transportation and provides people a choice in how they travel.

Enhance trail crossings in New Ulm with high-emphasis markings and a rail upon which bicyclists can lean, such as this part of the trail through Winter Garden, FL.

Consistent and prevalent bike route signage in Vancouver, British Columbia helps make the bike route more immediately recognizable.

In Boca Raton, FL, colorized bike lanes create even more visual delineation of space for bicyclists. The narrower vehicle lanes also tend to help calm traffic.

Case Study: Winter Garden, FL Revitalizes Downtown with a Trail

Contact
Mike Bollhoefer
Winter Garden City Manager
Email: mbollhoefer@cwgdn.com

In any downtown revitalization effort, it's critical to create a walkable setting with a distinct identity, a place where the streets are lively with public gathering spots, restaurants and shops. But success also turns on a city's ability to recognize a potential catalyst and to be strategic about tapping it.

In the case of Winter Garden, FL, both factors have played a role in a downtown renaissance that began a decade ago and continues today.

The city sits on the shores of Lake Apopka just 18 miles west of downtown Orlando. As a quiet community that benefited from the lake's popularity for bass fishing and its own history as a hub for the local citrus industry, the city flourished for much of the last century.

Challenges and Goals

Winter Garden's fortunes turned after a series of devastating freezes destroyed most of the orange groves in the 1980s, a time when Lake Apopka had become better known for its pollution than its fishery and suburban sprawl had become the predominant development pattern. Downtown took a hit, and by the 1990s it had become lifeless. But late in the decade, a new opportunity emerged with the opening of the West Orange Trail in 1998 as a multi-use trail that passed right by the city's doorstep. Winter Garden immediately saw a way to bring folks back downtown and wasted no time in making it happen.

Downtown Winter Garden, FL has been revitalized by an investment to bring the regional trail through the middle of "main street." Occupancy rates now are between 95 and 100 percent, with most merchants reporting an increase in sales.

Getting It Done

City officials invited the trail right in the 'front door' by connecting it to the heart of downtown, and then got to work on a streetscape project that was completed in 2003. They used tax-increment financing to put in brick-paved streets and for grants to do building facade cleanups, and they installed angled, on-street parking to help calm traffic. They rehabbed an historic theater for live performances and built a pavilion to serve as a gateway, adding landscaping and street trees that provide much-needed shade. The West Orange Trail now runs down the center of Plant Street, the primary route through downtown, providing easy access to its charming historic setting with sidewalk cafes and shops, a weekly farmers' market that draws 3,000 people, and other events and amenities.

A trail through the middle of downtown Winter Garden attracts 75,000 people per month.

Outcomes

The City had to overcome resistance to bringing the trail through downtown, and by keeping traffic speeds slow and giving bikes priority at the intersection of Plant and Main Streets, it has been able to reduce user conflicts. The trail now attracts 75,000 people a month to downtown, and 25 percent of merchants responding to a 2010 survey said it has prompted a 'significant' increase in sales, with another 43 percent saying it increased sales 'somewhat'.

"I call it our best marketing tool," says City Manager Mike Bollhoefer. "It works if you do it right: you've got to slow down the cars."

With so many people coming downtown, occupancy stands at 95 to 100 percent and some businesses wanting to lease space have been turned away. With mixed-use zoning, Winter Garden has been able to get high-tech and professional firms into second-story office space, with retail and restaurants on the street.

> *"I call it our best marketing tool. It works if you do it right: you've got to slow down the cars."*

Another goal is to attract more people into downtown condos. In 2014, Winter Garden will start the next phase of its downtown revitalization, which might include installing a roundabout at the corner of Plant Street and Dillard Street to create a transition area to encourage motorists who are driving into downtown to slow down. The City plans to narrow the road from five lanes to two at the intersection, add on-street parking and develop more retail on an underused corner that it owns.

G Additional Recommendations

Throughout town, consider these tools for transforming the built environment in New Ulm

Ensure people can walk and bike across the new Hwy 14/15 bridge

When it's rebuilt, ensure the Hwy 14/15 bridge accommodates people walking and biking. This is a critical east-west connection, and people who walk or bike shouldn't be excluded from its use.

A bridge in Olympia, WA

Remove snow from the bike trails

Adopt a standard practice of removing snow from trails. See the appendix for more about snow removal.


Hamburg, NY

Start thinking about utility corridors as trail opportunities

In many places throughout the country, municipalities are working with utilities to enhance quality of life for local residents, improve public health, increase property values and maximize land investments by enhancing utility corridors to double as trails. Through a strong partnership with the utilities, New Ulm may be able to do the same.


A utility corridor/trail in the Beach Cities of southern CA


Example bike shelter

Build a shelter for bikes at the high school

Currently, bike parking at the high school isn't covered. Extend the ability of high-school students to ride bikes to and from school by about a month on each side of the winter by providing a roof over the bikes. A group of parent volunteers can construct a simple bike shelter over the course of a weekend.

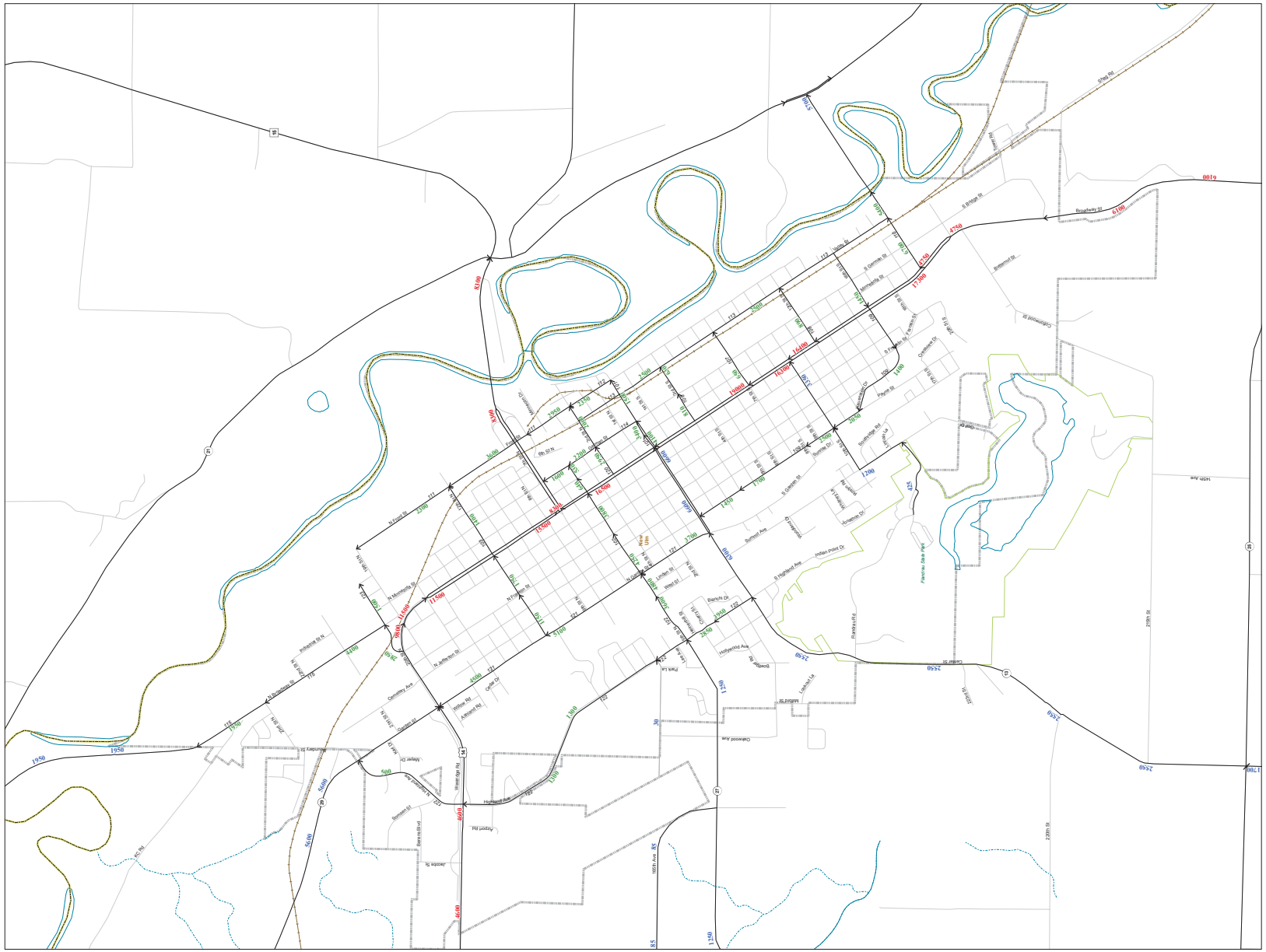
Appendix

1. *Traffic Volumes on State-Aid Roads in New Ulm, MN*
2. *Safe Routes to School City and District Policy Guide*
3. *Modern Roundabouts*
4. *18 Benefits of Urban Bike Lanes to Other Road Users*
5. *Snow Removal Guidance*
6. *Funding Sources and Partners Checklist*
7. *Town Maker's Guides Posters for Healthy Building Placement and Livable Schools*
8. *Active Living Toolkit*

Traffic Volumes

The project team gratefully acknowledges the assistance of the City of New Ulm in providing the following traffic-volume map for state-aid road segments.

2010 Traffic Volumes City of New Ulm



Numerals Indicate Average Annual Daily Traffic (AADT) Volumes on Designated Roads

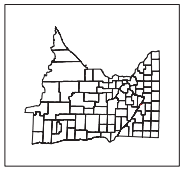
Traffic Volumes are Subject to Variability and Construction Effects
For More Info Visit:
http://www.dot.state.mn.us/traffic/data/html/aadt.html

MAP LEGEND

- Trunk Highway AADT
- CSAH and County Road AADT
- MSAS System AADT
- Interstate
- US Highway
- MN Highway
- CSAH
- MSAS
- County Road
- Other Roads
- Railroads
- Cities
- COUNTIES
- COUNTY SHEETS
- Lakes
- Rivers
- Perennial Streams
- Ditches
- National Forests
- National Parks
- Tribal Gov'ts
- State Forests
- State Parks

Map Source:
Minnesota Department of Transportation
Office of Transportation Data and Analysis
651-366-3800
http://www.w4oc.state.mn.us/traffic/data/html/volume_program.html

0 0.25 0.5 Miles



School Catchment Areas – A school catchment area is the geographic area from which students are eligible to attend a local school. When possible, the area should provide for safe access and short distance to schools, avoiding arterial crossings when appropriate. Catchment areas that are shaped to keep student distances to school short may also contribute to reduced congestion and road maintenance costs, reduced busing demand and cost, increased safety, more parental connection to the school, and helps to make the school a center of the community.

School Zone Speeds – Speed limits on Garden, Center, Payne, and possibly other streets within the 'School Zone' should be marked and enforced at 15 MPH, and the School Zone should extend to at least Center, S. Garden and 8th streets. (Case Study: San Francisco has implemented 15-mph speed limits within all school zones in the city.) Pedestrians struck by a car traveling 40 mph have an 85-percent chance of death, while pedestrians struck by cars traveling 20 mph have about a 95-percent chance of living. This underscores the need to find ways to slow down cars near schools. Three outstanding approaches are: 1) addressing the speed limits, 2) determining the size of the zones in which they are required and 3) ensuring law enforcement of the speed limits. If local speed limits are already reduced to 20 mph or lower, it may be helpful to consider working to change the size of school zones or residential areas. This could result in expanding the radius of the school zone from ¼ mile to ½ mile or more. (Resource: Safe Routes to School National Partnership Local Policy Guide

Snow Removal – City policy should ensure that sidewalks and bike lanes are cleared routinely. The city's snow removal policy for sidewalks and bike lanes should clearly state the city's duties during snowfall events. It should also stress how important is it that property owners assist in maintaining clear sidewalks and ramps in front of their properties. Information about fines should be stated for noncompliance, but reinforcing this with the more empathetic statements that clearing sidewalks is a courteous and caring act for fellow residents, especially the elderly and the young, may be a valuable perspective to add. The city should clear bike lanes within the same policies and procedures as the overall street snow clearing policy; language may need to be added to existing policy to ensure that bike lanes are cleared regularly. (Resource: http://www.walkinginfo.org/faqs/answer.cfm?id=4125)

Crossing Guards and Student Safety Patrol– Crossing guards are highly visible staff or volunteers who are responsible for the safe passage of students through street crossings near schools. Providing crossing guards at the school or district level eases parental concern about busy intersections and provides the opportunity for students to begin to learn lifelong pedestrian safety skills. Therefore, ensuring that crossing guards are well-trained, understand their role and are deployed at critical intersections can be vital to a successful program. Crossing guards are often trained and/or hired by the local police department but also can be part-time employees or volunteers of the school district. In most cases crossing guards are adults, but in some communities older students can also serve as student safety patrols, typically fifth grade and higher.

If crossing guards are difficult to recruit, and/or if more crossings are warranted, the district could consider this type of program, if it doesn't already exist. It isn't uncommon for teachers or parents to also work "double-duty" as a crossing guard in front of the school before and after school, or to supervise the student safety patrol or crossing guard program. Because of the wide variety of people that are crossing guards and the different supervisors that they might have, it is important to create a policy that dictates several facets of the crossing guard position and in many cases, creates a funding stream to ensure its success. (Resource: Safe Routes to School National Partnership Local Policy Guide)

The Modern Roundabout: A Proven Safety Countermeasure

There are many resources on roundabouts and mini-circles from federal, state and local department's of transportation. The U. S. Department of Transportation's Federal Highway Administration (FHWA) has identified modern roundabouts a proven safety countermeasure, or a lifesaving roadway strategy.

Roundabouts eliminate the need for cars to make left turns, which are particularly dangerous for pedestrians and bicyclists. Properly designed, single-lane roundabouts hold vehicles speeds to 15 to 20 mph. They can reduce injury crashes by 76 percent and reduce fatal crashes by 90 percent. (See the Insurance Institute for Highway Safety's website: http://www.iihs.org/research/topics/roundabouts.htm)

Roundabouts also can increase capacity by 30 percent by keeping vehicles moving. When installing roundabouts in a community for the first time, care should be taken to make roadway users comfortable with the new traffic pattern and to educate them about how to navigate roundabouts properly and to yield as appropriate.

For more information about modern roundabouts, visit the Federal Highway Administration's page on roundabouts at http://safety.fhwa.dot.gov/intersection/roundabouts/. Also, see the video here: http://1.usa.gov/9A9u2G.

Studies show that when compared to signalized intersections, roundabouts provide a:

- 90-percent reduction in fatal crashes
- 76-percent reduction in injury crashes
- 30 to 40 percent reduction in crashes involving pedestrians
- 10-percent reduction in bicycle crashes

Slower vehicle speeds (under 25 mph) mean:

- Drivers have more time to judge and react to other vehicles and pedestrians
- Easier to use for older and novice drivers
- Reduction in the severity of accidents
- Pedestrians are safer
- Provides traffic calming

Increased Capacity - Reduced Delay:

- 30-50% increase in traffic capacity
- Traffic always on the move-less delay

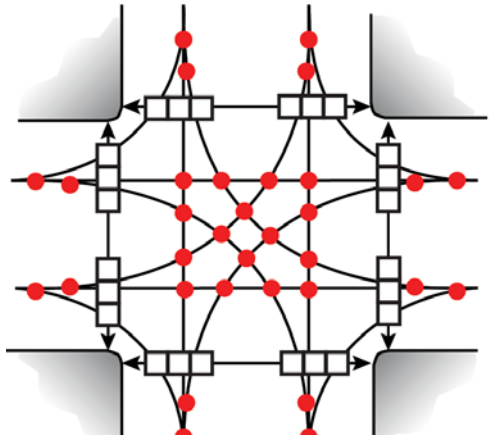
Other benefits include:

- Reduction in pollution and fuel use
- Less noise due to fewer stops and starts
- No signal equipment to install and repair - Averages savings of $5,000 per intersection per year
- Improves visual quality and character through landscaping

The double lane roundabout in Davidson, NC, encourages new development while managing traffic flow.

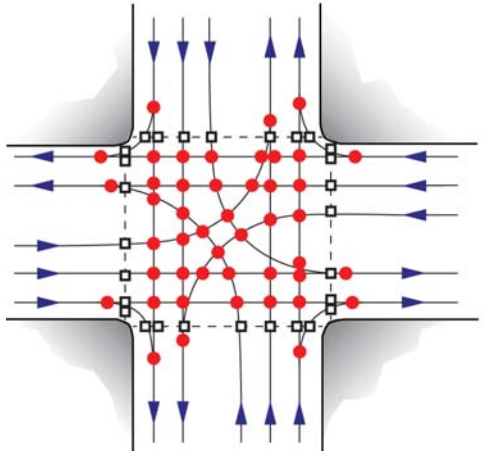
Roundabouts make crossings easier because the pedestrian crosses one leg at a time. The lower vehicular speed increases yielding behaviors by drivers. To assist visually impaired pedestrians, pavement markings can be positioned to provide an auditory clue that cars are entering and existing the intersection.

The Modern Roundabout: A Proven Safety Countermeasure



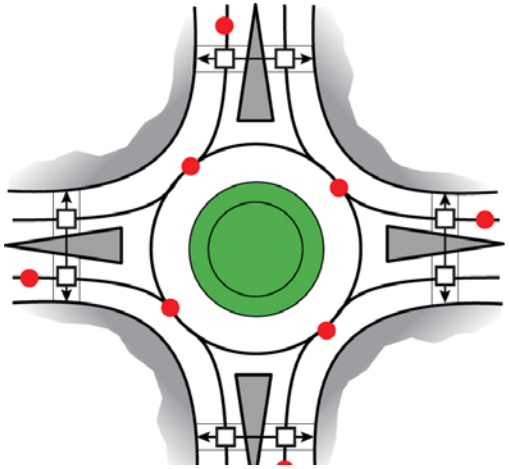
Conflicts at a conventional intersection with single lanes in each direction

- 32 vehicle-to-vehicle conflicts
- 24 vehicle-to-person conflicts



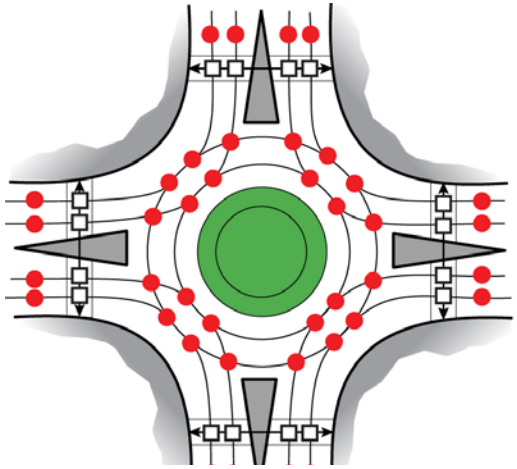
Conflicts at a conventional intersection with double-lanes and left-turn lane in each direction

- 46 vehicle-to-vehicle conflicts
- 28 vehicle-to-person conflicts



Conflicts at a single-lane, modern roundabout

- 8 vehicle-to-vehicle conflicts
- 8 vehicle-to-person conflicts



Conflicts at a double-lane, modern roundabout

- 24 vehicle-to-vehicle conflicts
- 16 vehicle-to-person conflicts

A single-lane roundabout reduces vehicle-to-vehicle conflicts points from 32 to eight, and vehicle-to-person conflicts from 24 to eight.

A multi-lane roundabout reduces vehicle-to-vehicle conflicts points from 46 to 24, and vehicle-to-person conflicts from 28 to 16.

18 Benefits of Urban Bike Lanes to Other Road Users - By Michael Ronkin

Urban streets have to satisfy many needs: various modes use them, and they provide local access to a community as well as mobility for through traffic. Many of the benefits of shoulders listed on the first page also apply to bike lanes in urban areas, whether they were created by restriping or by widening the road. Some street enhancements cannot be measured with numbers alone, as they offer values (e.g. trees) that simply make a community better. The following discussion should be viewed in this context. Bike lanes can provide the following benefits:

For Pedestrians

• Greater separation from traffic, especially in the absence of on-street parking or a planter strip, increasing comfort and safety. This is important to young children walking, playing or riding their bikes on curbside sidewalks.

• Reduced splash from vehicles passing through puddles (a total elimination of splash where puddles are completely contained within the bike lane).

• An area for people in wheelchairs to walk where there are no sidewalks, or where sidewalks are in poor repair or do not meet ADA standards.

• A space for wheelchair users to turn on and off curb cut ramps away from moving traffic.

• The opportunity to use tighter corner radii, which reduces intersection crossing distance and tends to slow turning vehicles.

• In dry climates, a reduction in dust raised by passing vehicles, as they drive further from unpaved surfaces.

For Motorists

• Greater ease and more opportunities to exit from driveways (thanks to improved sight distance).

• Greater effective turning radius at corners and driveways, allowing large vehicles to turn into side streets without off-tracking onto curb.

• A buffer for parked cars, making it easier for motorists to park, enter and exit vehicles safely and efficiently. This requires a wide enough bike lane so bicyclists aren't "doored."

• Less wear and tear of the pavement, if bike lanes are re-striped by moving travel lanes (heavier motor vehicles no longer travel in the same well-worn ruts).

For Other Modes

• Transit: A place to pull over next to the curb out of the traffic stream.

• Delivery vehicles (including postal service): a place to stop out of the traffic stream.

• Emergency vehicles: Room to maneuver around stopped traffic, decreasing response time.

• Bicyclists: Greater acceptance of people bicycling on the road, as motorists are reminded that they are not the only roadway users;

• Non-motorized modes: An increase in use, by increasing comfort to both pedestrians and bicyclists (this could leave more space for motorists driving and parking).

For the Community (Livability Factors)

• A traffic calming effect when bike lanes are striped by narrowing travel lanes.

• Better definition of travel lanes where road is wide (lessens the "sea of asphalt" look).

• An improved buffer to trees, allowing greater plantings of green canopies, which also has a traffic calming effect.

Snow Removal

Snow removal from roadways in Casper is an important consideration. So too is providing safe routes to all the places children need or want to walk, bike or roll. The two priorities aren't mutually exclusive, but providing for both requires some flexibility and creativity. In fact, many communities throughout the country that face heavy snowfall in the wintertime - including parts of Montana, Colorado, New York, Utah and Minnesota - have successfully implemented traffic-calming devices such as those recommended in this report and are experiencing higher levels of active transportation, even in cold months.

Experience shows that typical traffic-calming devices, including those recommended herein, do not prevent snow removal or create unsafe conditions due to residual snow build-up. In fact, all of the jurisdictions consulted for this report advise that roadway safety is their highest concern. They have successfully trained their drivers and adjusted their equipment and operations in order to build and maintain roadways safe for all users, not just cars.

The best practices for snow removal on streets where traffic-calming measures have been installed include:

- Using modified equipment to accommodate traffic-calming measures, such as rubber-tipped plows or rollers attached to the plow's underside. Note that this may require an investment in different trucks.
- Assigning staff to set routes, creating familiarity with traffic calming device locations.
- Appropriately marking the location of traffic-calming devices.
- Customizing the geometric design of traffic-calming devices.
- Maintaining close collaboration and cooperation between state and town snow-removal teams so that snow is not simply moved from the street to the recently plowed walkway or trail openings, back to the street and back to the walkway again.

Snow removal in Hamburg, NY, where road diets and traffic-calming devices have been implemented.

The concepts presented above represent techniques employed by other jurisdictions with similar snow conditions, but may need to be adjusted for the specific climate and conditions in Casper. Residents should expect that transit and school walking trips will be given the first priority for snow removal.

Specific advice is offered by Kyle Endelman, Public Works Manager for Sammamish, Washington, an area with snowfall and significant traffic-calming investments in place:

"We plow with a variety of trucks including one-ton, three-yard dump trucks F450s/F550s and five-yard dump trucks. We typically plow to the right side of the road. When we plow around a traffic circle we enter the traffic circle plowing to the right and then we straighten the plow out to plow straight ahead. Then we move the plow back to the right as we exit the circle on the next road. We may have to do this several times depending on how many roads are connected with the traffic circle.

"We do the same when entering a speed calming curb cut-out. We straighten our blade out as we enter the cut-out and then we return the plow to the right-hand side. This prevents snow from accumulating along the crosswalk or ADA ramps. In some traffic circle areas we have found that single plows F450/F350s work better than our larger trucks."

Snow Removal - continued

In areas where recommendations include narrowing travel lanes, adding bike lanes, and removing center turn lanes, snow storage can be managed in various ways:

- Preferably, plow snow to the center of the street. The roadway dimensions remain the same whether the road features bike lanes or a center turn lane. Thus, the driver will have ample curb-to-edge-of-snow-bank width. In many conditions, snow from winter storm events will have already been cleared before school arrival or departure. When snow is stored in the center of the roadway there is still adequate driving width. Motorists are permitted to drive over the marked bike lane, which may not be clearly seen under these conditions. If it appears that there will be confusion, the city should post signs stating that motorists may use bike lanes during snow storage periods.

- If necessary, snow can be pushed into the bike lanes until the trucks arrive to take the snow to melting fields. Plowing operations should only push the snow to this spot, or extend into the planting buffer, when one exists, and not be pushed into sidewalk areas.

- To address liability if bike lanes are encroached upon by vehicles when plowed snow is present, the city should adopt an ordinance that states that when winter storms call for snow storage in the center of roads, motorists and bicyclists should be on alert; motorists should reduce speeds to 20 mph in the presence of bicyclists; motorists should yield to bicyclists and pass only when it's safe; and bicyclists may choose to ride on sidewalks. Extra efforts should be made to keep these sidewalks cleared.

Center Turn Lanes

Continuous center turn lanes serve to speed up vehicles and are most often used where traffic volumes are high, such as 12,000 trips-per-day or more. Near schools, the opposite effect is sought: to slow vehicles down. Thus, the center turn lanes near CY Middle and other schools studied are not appropriate and should be removed. The added space that will be created by repainting for bike lanes is in keeping with the goal to keep speeds low and offer an improved buffer between travel lanes and the sidewalk. The slowing of vehicles when turning will slightly reduce efficiency in favor of a safer overall walking, bicycling and driving environment.

Best Practices: Snow removal policies.

Best Practices: Slow vehicles by removing center turn lanes and adding bike lanes.

Bicycle/Pedestrian Funding Opportunities

Project type	NHS	STP	HSIP	SRTS	TEA	CMAQ	RTP	FTA	TE	BRI	402	PLA	TCSP	JOBS	FLH	BYW
Bicycle and pedestrian plan		•				•						•	•			
Bicycle lanes on roadway	•	•	•	•	•	•		•	•	•					•	•
Paved shoulders	•	•	•	•	•	•				•					•	•
Signed bike route	•	•		•	•	•									•	•
Shared use path/trail	•	•		•	•	•	•								•	•
Single track hike/bike trail							•									
Spot improvement program		•	•	•	•	•										
Maps		•		•		•					•					
Bike racks on buses		•			•	•		•	•							
Bicycle parking facilities		•		•	•	•		•	•							•
Trail/highway intersection	•	•	•	•	•	•	•								•	•
Bicycle storage/service center		•		•	•	•		•	•				•	•		
Sidewalks, new or retrofit	•	•	•	•	•	•		•	•	•					•	•
Crosswalks, new or retrofit	•	•	•	•	•	•		•	•						•	•
Signal improvements	•	•	•	•	•	•										
Curb cuts and ramps	•	•	•	•	•	•										
Traffic calming		•	•	•									•			
Coordinator position		•		•		•							•			
Safety/education position		•		•		•					•					
Police patrol		•		•							•					
Helmet promotion		•		•	•						•					
Safety brochure/book		•		•	•	•	•				•					
Training		•		•	•	•	•				•					

Source: http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm#bp4.

**See the key on the following page for funding sources.*

Bicycle/Pedestrian Funding Opportunities Key		
NHS	National Highway System	http://www.fhwa.dot.gov/planning/nhs/
STP	Surface Transportation Program	http://www.fhwa.dot.gov/safetealu/factsheets/stp.htm
HSIP	Highway Safety Improvement Program	http://safety.fhwa.dot.gov/hsip/
SRTS	Safe Routes to School Program	http://safety.fhwa.dot.gov/saferoutes/
TEA	Transportation Enhancement Activities	http://www.fhwa.dot.gov/environment/te/index.htm
CMAQ	Congestion Mitigation/Air Quality Program	http://www.fhwa.dot.gov/environment/air_quality/cmaq/index.cfm
FLH	Federal Lands Highway Program	http://www.flh.fhwa.dot.gov/
BYW	Scenic Byways	http://www.fhwa.dot.gov/hep/byways/index.htm
BRI	Highway Bridge Program	http://www.fhwa.dot.gov/bridge/hbrrp.htm
SCTSP	State and Community Traffic Safety Program	http://safety.fhwa.dot.gov/policy/section402/
PLA	State/Metropolitan Planning Funds	http://www.fta.dot.gov/grants/13093_3563.html
TCSP	Transportation, Community and System Preservation Pilot Program	http://www.fhwa.dot.gov/tcsp/index.html
JOBS	Access to Jobs/Reverse Commute Program	http://fta.dot.gov/grants/13093_3550.html
RTP	Recreational Trails Program	http://www.fhwa.dot.gov/environment/rectrails/index.htm
FTA	Federal Transit Capital, Urban & Rural Funds	http://www.fta.dot.gov/grants_263.html
TE	Transit Enhancements	http://www.fhwa.dot.gov/environment/te/te_provision.htm

Source: http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm#bp4.

Funding Sources and Potential Partners Checklist

Date Contacted	Agency	Website
	Health Department	*http://www.apha.org/about/Public+Health+Links/LinksStateandLocalHealthDepartments.htm* *http://www.naccho.org/toolbox/*
	Main Street Program	*http://www.preservationnation.org/about-us/partners/*
	Chamber of Commerce	*http://www.uschamber.com/chambers/directory/default*
	Community Foundations	*http://www.cof.org/whoweserve/community/resources/index.cfm?navItemNumber=15626#locator*
	Local and State Elected Officials	*http://www.capwiz.com/apha/dbq/officials/*
	Transportation Enhancement Funding by State	*http://www.enhancements.org/Links.asp#statedot*
	State Bike and Pedestrian Coordinator	*http://www.walkinginfo.org/assistance/contacts.cfm*
	State Safe Routes to School Coordinator	*http://www.saferoutesinfo.org/program-tools/find-state-contacts*
	American Public Health Association	*http://www.apha.org/advocacy/priorities/issues/transportation*
	Federal Highway Administration Bicycle and Pedestrian Program	*http://www.fhwa.dot.gov/environment/bikeped/*
	Federal Highway Administration State Manual	*http://www.fhwa.dot.gov/planning/statewide/manual/manual.pdf*
	Department of Housing and Urban Development CDBG	*http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs*
	Partnership for Sustainable Communities (DOT, HUD, EPA)	*http://www.sustainablecommunities.gov/*
	Centers for Disease Control and Prevention	*http://www.cdc.gov/transportation/docs/FINAL%20CDC%20Transportation%20Recommendations-4-28-2010.pdf*
	AARP Livable Communities	*http://www.aarp.org/home-garden/livable-communities/*
	Active Living By Design	*http://www.activelivingbydesign.org/*
	Alliance for Biking and Walking Resources	*http://www.peoplepoweredmovement.org/site/index.php/members/members3/C258*
	America Bikes	*http://americabikes.org*
	America Walks Resources	*http://americawalks.org/resources/links*
	Association of Pedestrian and Bicycling Professionals	*http://www.apbp.org/*
	Complete Streets Coalition	*http://completestreets.org*
	League of American Bicyclists	*http://www.bikeleague.org/*
	National Center for Bicycling and Walking	*http://www.bikewalk.org/*
	Partnership for a Walkable America	*http://www.walkableamerica.org/*
	Safe Communities	*http://safecommunitiesamerica.org/*
	Smart Growth America	*http://www.smartgrowthamerica.org/about/our-coalition/*
	Transportation for America	*http://t4america.org*


TOWN MAKER'S GUIDE:
Healthy Building Placement
Walkable and Livable Communities Institute
Drive-thru oriented building fails to address the street
Over-head electrical poles add to visual clutter
Strip center retail
Shoebox lighting too tall for human scale
Billboard signage scaled for passing automobiles
Retail corner entrance with residential above
Multi-family units on secondary street
Surface parking interior to development
Attractive buildings front the main street adding to the living experience
Trees line streets to create a sense of enclosure
AUTOMOBILE FOCUSED
PEOPLE FOCUSED
EDGES
SIDEWALKS
PARKING
BUILDINGS
CHARACTER
Edges are essential for a comfortable walk. Edges define spaces and provide visual cues to guide appropriate behaviors. Open areas such as this create high levels of discomfort for both walkers and drivers. Without an edge, walkers feel they have entered the motorist's realm and motorists feel that pedestrians do not belong, so they do not respect them. Edgeless streets look sick and make people feel sad.
Sidewalks must be a comfortable width (typically 6-10 feet for suburban commercial areas), be separated from the curb with a planter strip of 6-10 feet, be continuous and not open to numerous driveways. In general, the higher the roadway speed the wider the planter strip. This space lacks a sidewalk completely, but even the portion with a walk does not "invite" walking.
Parking set to the front of a building devalues walking in many ways. It creates building-to-building swaths of asphalt as wide as 400 feet. Such inhospitable environments (too hot in the summer, too cold in the winter and lonely all the time) do not honor walking, bicycling, transit, or even auto arrivals. Off-street parking takes three times as much land as on-street parking.
Walkability requires easy and complete access to buildings. When buildings are set back, arrival by foot is plagued with problems. Individual properties often carve up the front of a block into independent parking lots and this fractionalizing of land creates ugly and unpleasant spaces to traverse. It devalues the overall experience and also the overall land value. Property owners rarely take care of these spaces, investing instead in large signs advertising to drivers.
Suburban style strip malls and building types are often devoid of character and personality. They are large, faceless, lifeless, uninteresting, uninspiring spaces. Walkers tend to shun such "voids" and motorists tend to speed up when they come across them. These spaces can be anywhere - they have a universal ugliness. Health studies reveal that people in ugly places have elevated blood pressure. Road rage also increases.
EDGES
SIDEWALKS
PARKING
BUILDINGS
CHARACTER
Quality edges provide a protective enclosure satisfying the human eye, heart and foot. Edges address our need for comfort, safety and security. Creating a sense of enclosure usually requires building to the interior edge of walkways, planting ground cover and trees, and including on-street parking to buffer the pedestrian from moving traffic. Edges are essential to an enjoyable walking experience.
Sidewalks of sufficient width allow walking to be the most natural, fun, rewarding and healthy way to travel. They allow people to enjoy walking, a relaxed conversation with another, to linger or sit outdoors at a café, and they encourage people to stay and socialize. Although sidewalks can be made of a number of materials from concrete to pavers, the most pleasant walkways have a simple elegance—they are well constructed and maintained.
The combination of on-street parking and urban buildings carefully screen or fully hide off-street parking. Off-street parking is placed in interior courts or in well landscaped gardens to the side or rear of the building. Thriving downtowns or pleasant villages rarely require off-street parking minimums. In many cases today, municipalities prescribe maximum number of spaces that are allowed, which makes better use of limited space.
Quality buildings not only create an address, they address the street. Well designed urban buildings have 70-90% glass at grade, giving natural surveillance to the street. A palette of colors, shapes, tones, textures, window styles add predictability, authority and dignity to a street. In order to improve mobility and accessibility, buildings need to have convenient breaks and pauses, certainly every 400 feet and sometimes less.
Buildings can be simple in their designs, but they must help contribute to the character, personality, style, complexity, elegance, charm and experience of the street. In this way, they define where we are. We want to play in our environment, celebrate great artistry and cultural achievements, and create a place that is always fun to come back to, enjoy and protect. A great street is also great theatre.
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Poster Illustrated by TDC Design Studio

TOWN MAKER'S GUIDE:
Livable Schools

Walkable and Livable Communities Institute

STREETS/PARKING

Streets should support walking, bicycling and vehicle movement. Lanes should be no more than 10 feet wide and, if possible, should be separated from on-street parking by a two-foot valley gutter. On-street parking gives motorists a place to wait when picking up children and uses as little as a third of the space of off-street parking. Restricting parking times along the curbs next to the school allows these areas to be used for student drop-off and pick-up. Signs should inform motorists to stay with their cars at all times. Head-out (or reverse) angled parking is the safest and most efficient on-street parking. Head-in angled parking and parallel parking also can be good options. On-site parking may not be available, but can be minimized.

CROSSINGS

Around schools, drivers should feel that they are entering a pedestrian realm and that people may be using crossings any time of day. Where crossings are located, streets should be designed so that traffic is slow — between 15 and 20 mph — and sight lines are good. At higher speeds, motorists are less likely to yield to pedestrians and the risk increases. Crossings are best with good lighting, when students cross one lane at a time, and when students and drivers can clearly recognize and respond to each other. Median islands, curb extensions (or "bulb outs") and raised table crossings help create these conditions.

DROP-OFF/PICK-UP

With high rates of students arriving and leaving school in cars, there are many "conflict points" between motorists, walkers and bicyclists. If volumes of traffic are high, on-school drop-off and pick-up patterns can include compact, stacking areas that are monitored at all times by adults to ensure that children are only exiting vehicles at the front of the queue when all cars are stopped. It is helpful to have a "valet" program through which adult volunteers or older students – under the guidance of staff – open and close car doors and help students find their parents. On-street parking and nearby parking options, such as a church parking lot, can help. Signs ask parents to turn off their engines, which helps reduce vehicle emissions and protect children's lungs.

SECURITY

Schools should be integrated into neighborhood designs to provide high levels of "watchfulness" over children. Homes, apartments and townhouses should be near the streets and their "A" sides — their fronts, where abundant windows allow occupants to look outside — should face the streets where students will be walking and bicycling. Each school building should have windows. Low fences and landscaping features can define play areas and access points. Bicycle parking should be located where it is highly visible and sheltered from the elements.

TREES

Street trees not only provide shade and a nice environment, but also create comfort and separation for students walking and bicycling. When placed within four to six feet of the street, trees create a vertical wall that helps lower vehicle speeds and absorb vehicle emissions. On streets with a narrow space between the sidewalk and curb (also known as the "furniture zone") trees can be planted in individual tree wells between parking stalls, which further tightens the visual appearance of the street and reduces travel speeds. Depending on the species, they should be spaced 15 to 25 feet apart.

SEPARATION

At the school, it is best to separate the different modes of travel (walking, bicycling, bus and parent driving). Sidewalks and school entries should be designed to keep walking and cycling students from crossing the pathway of motorists. Parking lots should be designed so students don't need to walk through them to enter or exit the school. When these conflicts cannot be avoided fully, raised table crossings are encouraged. Additional design elements such as colorized or raised crossings improve detection between motorists and students, and they give motorists a clear message that they are to slow down and yield to students.

SHARED PARKS

Neighborhoods are most complete when public spaces such as parks are co-located with schools. In this way, a community's important assets are available in one place. Parking is shared, shade is available, neighbors keep watch over the park and the school, students have quality places to play or wait for their parents, and social exchange amongst all age groups is fostered. Co-located facilities help hold a community together, providing the highest level of conservation and sustainability.

INTERSECTIONS

Intersections near schools should be designed to keep motorists' speeds under control — typically no higher than 15 to 20 mph — no matter what time of day. Turning speeds are especially important and can be controlled with mini-circles, roundabouts and raised intersections. Curb extensions (also called "bulb outs") and inset parking help motorists to see pedestrians and pedestrians to see motorists. They also reduce crossing distance time and exposure, and they slow motorists on all turns.

SIDEWALKS

Sidewalks, trails, walkways and ramps should be on both sides of the street around the entire perimeter of the school. Where sidewalk gaps exist, they should be fixed on a priority basis, working out block-by-block from the school. Sidewalks around the school should be at least eight feet wide and should be separated from the curb by a "furniture zone" that can accommodate planter strips, tree wells, hydrants, benches, etc. Where appropriate, on-street parking or bike lanes provide an additional buffer to the sidewalk.

ACCESS

Students should have easy access to the campus from each direction of approach. Adjoining properties shouldn't be walled off from the school or from the routes to school. Pedestrian and cycling students should be able to use links that shorten trip distances and disperse the traffic for pick-up and drop-off around the school.

Although this document highlights many of the key components of properly planning and designing school sites, there are others to consider. For example, educational programming plays a major role in the activities that need to be accommodated. More space for outdoor physical activity may be needed. The square footage of the building may be less or greater. Renovating an older school may be an option, which requires a cost-benefit analysis. Additionally, local conditions and policies need to be accommodated. School attendance policies affect the distance students must travel and whether they arrive by car, bus, bicycle, or foot. Rural environments, open attendance policies, charter schools and magnet schools can pose challenges to walkability, but motor trips can still be combined with walking trips through strategies such as "Park and Walk" programs.

The following can be of help:

National Center for Safe Routes to School, www.saferoutesinfo.org
Council of Educational Facility Planners International, www.cefpi.org
American Architectural Foundation, www.archfoundation.org
National Trust for Historic Preservation, www.preservationnation.org

Illustrated by TDC Design Studio. November 2010.

Active Living *Toolbox*

The tools provided herein are focused on encouraging active living and active transportation.

Walking is the oldest and most efficient, affordable, and environmentally friendly form of transportation. Walking is the first thing human beings want to do, and the last thing they want to give up.

Walking and other forms of active transportation build strong communities, help neighbors get to know one another, and improve mental and physical health of residents. Your efforts to encourage active transportation may fall into one of four categories: policy, programs, projects and personal commitments, as described below.

POLICY

You may decide to review your guiding documents for language and ordinances in support of active transportation. You may wish to learn more about Complete Streets policy or review your Municipal Code for elements that presently encourage sprawl. Focusing on Form Based Code, meeting with your planning commission or discovering the vision set forth by your community are all great first steps.

PROGRAMS

Educational in nature, programs can range from walking school buses and bike clinics to a lecture series in support of active transportation. Programs allow you to meet your community and bring information with creative, unique events that tap local interest.

PROJECTS

On the ground projects may include a total corridor reconstruction or the addition of specific traffic calming features. This toolbox includes street treatments that support active transportation.

PERSONAL COMMITMENT

In general, people become less physically active as they get older. Nearly 40 percent of those 55 and older report no leisure-time physical activity. Yet we know that regular activity can prevent bone loss, reduce the risk of fractures and other ailments, including coronary heart disease, hypertension, non-insulin-dependent Type 2 diabetes, colon cancer, depression and anxiety. If something in your immediate environment is preventing regular physical activity, it's time to make a personal commitment to solve this problem.

Whether you work at the policy, program, project or personal level, you can encourage active living by recognizing barriers and working as a community to remove them. Use the tools that follow to help transform your community.

ACTIVE LIVING TOOLBOX CONTENTS

Active Living Matters: A Fact Sheet

Obesity and Disease

- The costs of obesity account for approximately nine percent of total U.S. health care spending.
- The total economic cost of obesity is $270 billion per year.
- Two out of three American adults 20 years and older are overweight or obese.
- It is estimated that 75 percent of American adults will be overweight or obese by 2015.
- Childhood obesity has more than tripled in the past 30 years.
- In 2010, 10.9 million or nearly 27 percent of U.S. residents age 65 or older had diabetes.
- About 1.9 million people age 20 years or older were newly diagnosed with diabetes in 2010. Diabetes is the seventh leading cause of death in the United States.

2010 State Obesity Rates

State	%	State	%	State	%	State	%
Alabama	32.2	Illinois	28.2	Montana	23.0	Rhode Island	25.5
Alaska	24.5	Indiana	29.6	Nebraska	26.9	South Carolina	31.5
Arizona	24.3	Iowa	28.4	Nevada	22.4	South Dakota	27.3
Arkansas	30.1	Kansas	29.4	New Hampshire	25.0	Tennessee	30.8
California	24.0	Kentucky	31.3	New Jersey	23.8	Texas	31.0
Colorado	21.0	Louisiana	31.0	New Mexico	25.1	Utah	22.5
Connecticut	22.5	Maine	26.8	New York	23.9	Vermont	23.2
Delaware	28.0	Maryland	27.1	North Carolina	27.8	Virginia	26.0
District of Columbia	22.2	Massachusetts	23.0	North Dakota	27.2	Washington	25.5
Florida	26.6	Michigan	30.9	Ohio	29.2	West Virginia	32.5
Georgia	29.6	Minnesota	24.8	Oklahoma	30.4	Wisconsin	26.3
Hawaii	22.7	Mississippi	34.0	Oregon	26.8	Wyoming	25.1
Idaho	26.5	Missouri	30.5	Pennsylvania	28.6		

Air Quality

- Asthma is a major public health problem in the United States with 22 million people currently diagnosed with asthma—12 million of whom have had an asthma attack in the past year.
- Seven percent of adults and nearly nine percent of all children have asthma. In poor and minority communities, the rates are higher.
- People living within 300 meters of major highways are more likely to have asthma, leukemia and cardiovascular disease.
- The health costs associated with poor air quality from the U.S. transportation sector is estimated at $50–$80 billion per year.

Active Living Matters: A Fact Sheet

Safety

- In 2009, 33,963 people were killed in traffic-related incidents in the U.S.
- Between 2000 and 2009, 47,700 pedestrians were killed by automobiles.
- Although people age 65 and older made up less than 13 percent of the total U.S. population between 2000 and 2007, they represented nearly 22 percent of pedestrian deaths during that period. (Source: http://t4america.org/docs/dbd2011/Dangerous-by-Design-2011.pdf)
- The oldest pedestrians (75 years and older) suffered from pedestrian fatality rates of 3.61 per 100,000 people, a rate well more than twice that for people under 65 years of age.
- Motor vehicle-related fatalities and injuries cause an estimated $180 billion annually in property damage and health impacts.

Mental Health

- Americans spend an average of 100 hours per year commuting.
- Higher rates of physical activity are associated with reduced risk of depression, while physical inactivity is a known risk factor for depression.
- Since 2000, antidepressants have become the most prescribed medication in the United States.

The Most Dangerous Large Metro Areas, Ranked by PDI*

Rank	Metro area	Total pedestrian deaths (2000-2009)	Avg. annual pedestrian deaths per 100,000 (2000-2009)	Percent of workers walking to work (2005-2009)	**Pedestrian Danger Index**
1	Orlando-Kissimmee, FL	557	3.0	1.2%	**255.4**
2	Tampa-St. Petersburg-Clearwater, FL	905	3.5	1.6%	**212.7**
3	Jacksonville, FL	342	2.8	1.6%*	**177.8**
4	Miami-Fort Lauderdale-Pompano Beach, FL	1,555	2.9	1.7%	**167.9**
5	Riverside-San Bernardino-Ontario, CA	938	2.5	1.8%	**139.2**
6	Las Vegas-Paradise, NV	421	2.5	1.9%	**135.2**
7	Memphis, TN-MS-AR	266	2.1	1.6%*	**132.6**
8	Phoenix-Mesa-Scottsdale, AZ	867	2.3	1.7%	**132.4**
9	Houston-Sugar Land-Baytown, TX	1,024	2.0	1.5%	**128.2**
10	Dallas-Fort Worth-Arlington, TX	942	1.6	1.4%	**119.4**

These two metros have a margin of error of over 10 percent for the Journey To Work data.

• *Pedestrian Danger Index*

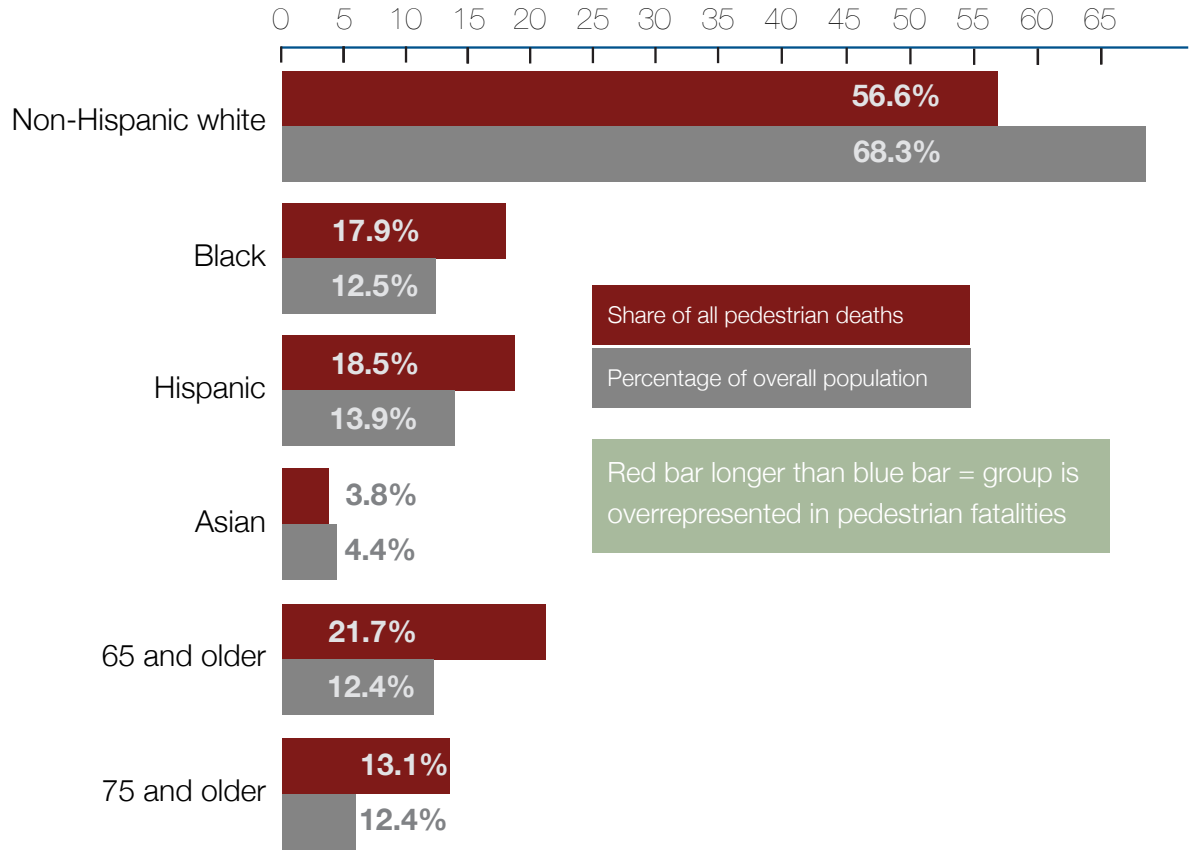
Source: http://t4america.org/docs/dbd2011/Dangerous-by-Design-2011.pdf

Social Equity

- Older populations are over-represented in intersection fatalities by a factor of more than two-to-one.
- Half of all non-drivers age 65 and over—four million Americans—stay at home on a given day because they lack transportation.
- By 2015, more than 15.5 million Americans age 65 and older will live in communities where public transportation options are minimal or nonexistent.
- Transportation is the second largest expense for American households, costing more than food, clothing and health care. Americans spend an average of 18 cents of every dollar on transportation, with the poorest one-fifth of families spending more than double that figure.
- States with the least leisure-time activity were Alabama, Kentucky, Louisiana, Mississippi, Oklahoma and Tennessee. States with the most were California, Colorado, Hawaii, Minnesota, Oregon, Vermont and Washington.

Percentage of pedestrian deaths compared to share of population

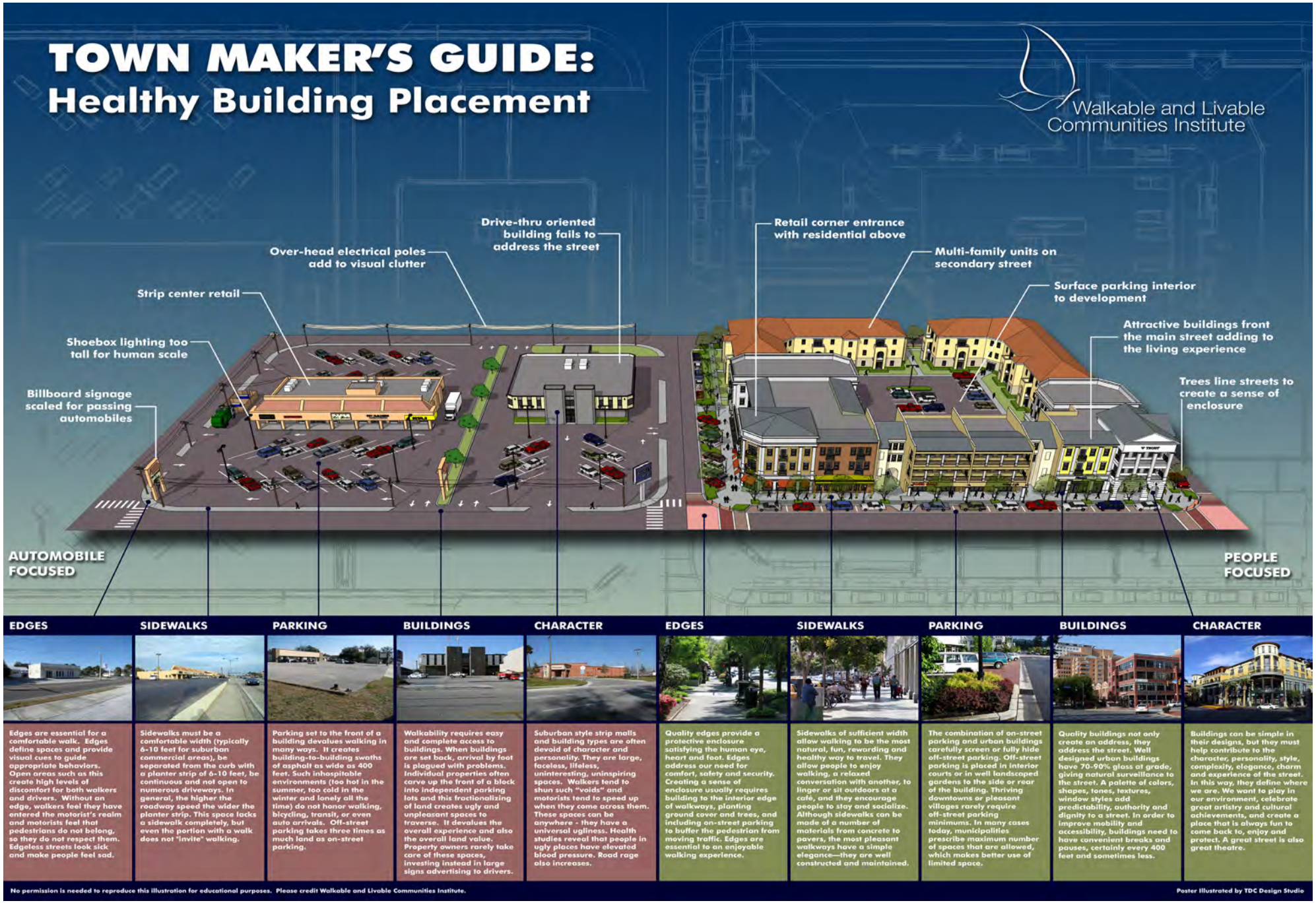
Source: http://t4america.org/docs/dbd2011/Dangerous-by-Design-2011.pdf



Town Maker's Guides

The Town Maker's Guides showcase best practices for building placement and school siting. Too often, the built environment encourages inappropriate and dangerous behaviors. The Guides explain the visual cues that streets and buildings provide and how to transform communities into safe, vibrant, healthy places.

Town Maker's Guide to Healthy Building Placement

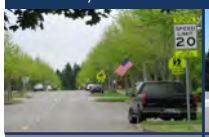


Town Maker's Guide to Healthy School Siting

TOWN MAKER'S GUIDE: Livable Schools

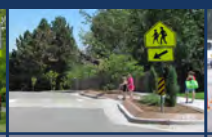
Walkable and Livable Communities Institute

STREETS/PARKING



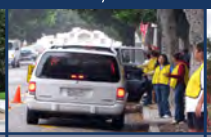
Streets should support walking, bicycling and vehicle movement. Lanes should be no more than 10 feet wide and, if possible, should be separated from on-street parking by a two-foot valley gutter. On-street parking gives motorists a place to wait when picking up children and uses as little as a third of the space of off-street parking. Restricting parking times along the curbs next to the school allows these areas to be used for student drop-off and pick-up. Signs should inform motorists to stay with their cars at all times. Head-out (or reverse) angled parking is the safest and most efficient on-street parking. Head-in angled parking and parallel parking also can be good options. On-site parking may not be avoidable, but can be minimized.

CROSSINGS



Around schools, drivers should feel that they are entering a pedestrian realm and that people may be using crossings any time of day. Where crossings are located, streets should be designed so that traffic is slow — between 15 and 20 mph — and sight lines are good. At higher speeds, motorists are less likely to yield to pedestrians and the risk increases. Crossings are best with good lighting, when students cross one lane at a time, and when students and drivers can clearly recognize and respond to each other. Median islands, curb extensions (or "bulb outs") and raised table crossings help create these conditions.

DROP-OFF/PICK-UP



With high rates of students arriving and leaving school in cars, there are many "conflict points" between motorists, walkers and bicyclists. If volumes of traffic are high, on-school drop-off and pick-up patterns can include compact, stacking areas that are monitored at all times by adults to ensure that children are only exiting vehicles at the front of the queue when all cars are stopped. It is helpful to have a "valet" program through which adult volunteers or older students – under the guidance of staff – open and close car doors and help students find their parents. On-street parking and nearby parking options, such as a church parking lot, can help. Signs ask parents to turn off their engines, which helps reduce vehicle emissions and protect children's lungs.

SECURITY

Schools should be integrated into neighborhood designs to provide high levels of "watchfulness" over children. Homes, apartments and townhouses should be near the streets and their "A" sides — their fronts, where abundant windows allow occupants to look outside — should face the streets where students will be walking and bicycling. Each school building should have windows. Low fences and landscaping features can define play areas and access points. Bicycle parking should be located where it is highly visible and sheltered from the elements.

TREES

Street trees not only provide shade and a nice environment, but also create comfort and separation for students walking and bicycling. When placed within four to six feet of the street, trees create a vertical wall that helps lower vehicle speeds and absorb vehicle emissions. On streets with a narrow space between the sidewalk and curb (also known as the "furniture zone") trees can be planted in individual tree wells between parking stalls, which further tightens the visual appearance of the street and reduces travel speeds. Depending on the species, they should be spaced 15 to 25 feet apart.

SEPARATION

At the school, it is best to separate the different modes of travel (walking, bicycling, bus and parent driving). Sidewalks and school entries should be designed to keep walking and cycling students from crossing the pathway of motorists. Parking lots should be designed so students don't need to walk through them to enter or exit the school. When these conflicts cannot be avoided fully, raised table crossings are encouraged. Additional design elements such as colorized or raised crossings improve detection between motorists and students, and they give motorists a clear message that they are to slow down and yield to students.

SHARED PARKS

Neighborhoods are most complete when public spaces such as parks are co-located with schools. In this way, a community's important assets are available in one place. Parking is shared, shade is available, neighbors keep watch over the park and the school, students have quality places to play or wait for their parents, and social exchange amongst all age groups is fostered. Co-located facilities help hold a community together, providing the highest level of conservation and sustainability.

INTERSECTIONS

Intersections near schools should be designed to keep motorists' speeds under control — typically no higher than 15 to 20 mph — no matter what time of day. Turning speeds are especially important and can be controlled with mini-circles, roundabouts and raised intersections. Curb extensions (also called "bulb outs") and inset parking help motorists to see pedestrians and pedestrians to see motorists. They also reduce crossing distance time and exposure, and they slow motorists on all turns.

SIDEWALKS

Sidewalks, trails, walkways and ramps should be on both sides of the street around the entire perimeter of the school. Where sidewalk gaps exist, they should be fixed on a priority basis, working out block-by-block from the school. Sidewalks around the school should be at least eight feet wide and should be separated from the curb by a "furniture zone" that can accommodate planter strips, tree wells, hydrants, benches, etc. Where appropriate, on-street parking or bike lanes provide an additional buffer to the sidewalk.

ACCESS

Students should have easy access to the campus from each direction of approach. Adjoining properties shouldn't be walled off from the school or from the routes to school. Pedestrian and cycling students should be able to use links that shorten trip distances and disperse the traffic for pick-up and drop-off around the school.

Although this document highlights many of the key components of properly placing and designing school sites, there are others to consider. For example, educational programming plays a major role in the activities that need to be accommodated. More space for outdoor physical activity may be needed. The square footage of the building may be less or greater. Renovating an older school may be an option, which requires a cost-benefit analysis. Additionally, local conditions and policies need to be accommodated. School attendance policies affect the distance students must travel and whether they arrive by car, bus, bicycle, or foot. Rural environments, open attendance policies, charter schools and magnet schools can pose challenges to walkability, but motor trips can still be combined with walking trips through strategies such as "Park and Walk" programs.

The following can be of help:

National Center for Safe Routes to School, **www.saferoutesinfo.org**
Council of Educational Facility Planners International, **www.cefpi.org**
American Architectural Foundation, **www.archfoundation.org**
National Trust for Historic Preservation, **www.preservationnation.org**

Illustrated by TDC Design Studio. November 2010.

Policy, Planning, Design Guidelines and Programs

The following policy, plans, design guidelines and programs support active living. As you learn more about these elements, consider how active living can be furthered where you work, live and play. Assessing the policy in place, current planning efforts, local street design guidelines and educational programs are steps to a more livable community.

Complete Streets Policy

A Complete Streets policy ensures choices to the community by making walking, bicycling and taking public transportation more convenient, easy and safe. Changing policy so that transportation systems consider the needs of pedestrians, bicyclists and transit users means that people of all ages and abilities are included in the planning and design processes.

Land use and transportation policy can either contribute to or detract from community building. When thoughtfully integrated, land use and transportation policies and strategies can jointly preserve and even enhance natural and cultural resources and create better built environments that are walkable, livable and sustainable.

Regardless of a policy's form, the National Complete Streets Coalition has identified ten elements of a comprehensive Complete Streets Policy.

- Includes a vision for how and why the community wants to complete its streets
- Specifies that 'all users' includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses, emergency vehicles, and automobiles.
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.
- Is understood by all agencies to cover all roads.
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way.
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions.
- Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs.
- Directs that Complete Streets solutions will complement the context of the community.
- Establishes performance standards with measurable outcomes.
- Includes specific next steps for implementation of the policies.

A photo-visualization of a "complete street" created by the WALC Institute for AARP and AARP Georgia.

RESOURCES

Rural by Design by Randall Arendt

The Timeless Way of Building and *A Pattern Language* by Christopher Alexander

Sprawl Repair Manual by Galina Tachieva

National Complete Streets Coalition at http://www.completestreets.org/complete-streets-fundamentals/resources/

Pedestrian Master Planning

Walkable communities outperform car-oriented communities economically. Nearly everyone, for at least some portion of every day, is a pedestrian. This is why pedestrian planning matters. Pedestrian master planning establishes the policies, programs, design criteria, and projects that will further enhance pedestrian safety, comfort, and access in a community. Through the pedestrian master planning efforts, a community will have environmentally, economically, and socially sustainable transportation systems.

A pedestrian master plan helps communities to:

- Review existing plans, policies, guidelines and codes to determine whether inherent conflicts exist within these documents that might impact the continuity of pedestrian infrastructure across the cities' borders.
- Build a toolbox and best practices that inform pedestrian planning. Tools can include performance methods and monitoring that functions within the area.
- Propose and refine treatments to ensure the integrity of the pedestrian network and to provide clear messaging to users about pedestrian rights and responsibilities.
- Perform field research to identify conflicts, especially noting conditions such as sidewalk gaps and the distribution of existing pedestrian facilities.
- Analyze needs and demand based on information gathered, allowing a broader understanding of patterns, behaviors and origins and destinations.
- Perform a security analysis because people will not walk if they feel that they must navigate through an area with no activity or "eyes on the street."
- Determine where they need to add shade to streets and sidewalks, because if you want people to walk in all temperatures, it's necessary to provide environments that are comfortable for walking.
- Develop criteria for ranking, prioritizing and implementing projects for maximum impact and to better support current initiatives.
- Develop funding strategies that might reduce the burden of improvements.
- Identify planned improvements to determine whether they support or conflict with other initiatives.

RESOURCES

The **Pedestrian and Bicycle Information Center (PBIC)** is a national clearinghouse for information about health and safety, engineering, advocacy, education, enforcement, access, and mobility for pedestrians (including transit users) and bicyclists. The PBIC serves anyone interested in pedestrian and bicycle issues, including planners, engineers, private citizens, advocates, educators, police enforcement, and the health community. Model pedestrian plans are available at http://www.walkinginfo.org/develop/sample-plans.cfm

Pedestrian Master Planning focuses on pedestrian safety, comfort and access in a community.

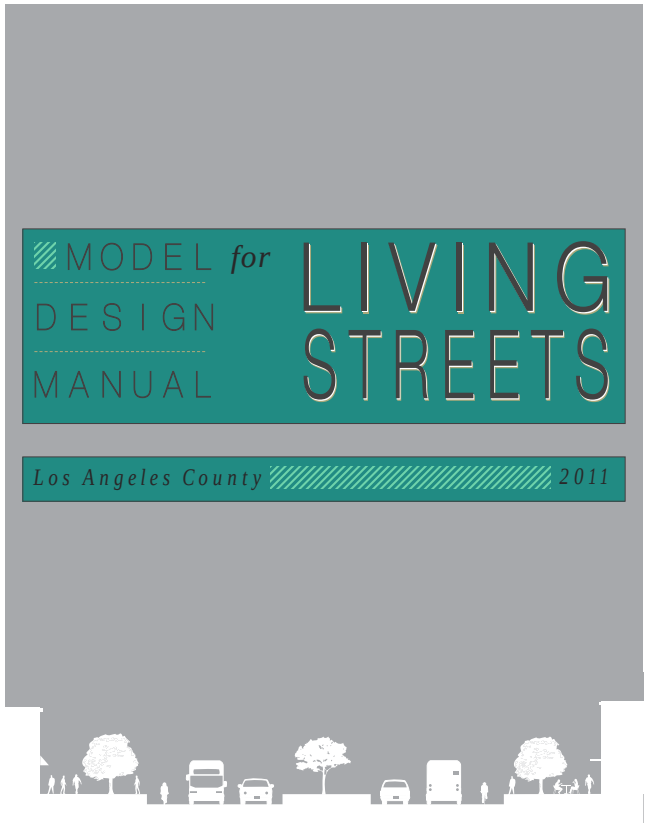
Street Design Guidelines for Livable Communities

Streets play a significant role in livability. The design of streets impacts access, choice of travel mode, safety, comfort, health, identity, retail success, economic vitality and community quality of life. Faced with the challenges of meeting transportation demand while preserving the character of the community, municipalities are creating and adopting Street Design Guidelines. This is also a great next step once a Complete Streets policy is in place. Livable Street Design Guidelines move communities away from an approach to street design that only considers traffic volume. Street Design Guidelines set forth street standards and provide guidance as you are designing new streets or improving existing streets. These guidelines provide new metrics for measuring the success of a street. The Street Design Guide provides an assessment of local street typologies and highlights traffic calming features that have a history of success locally.

When crafting Street Design Guidelines, communities should look to the following documents to ensure that their guidelines fall within acceptable standards:

- Policy on Geometric Design of Highways and Streets, known as "The Green Book," by the American Association of State Highway Transportation Officials (AASHTO)
- Traditional Neighborhood Development Street Design Guidelines, by the Institute of Transportation Engineers (ITE)
- The Manual on Uniform Traffic Control Devices (MUCTD) by the FHWA

It is important to note that virtually all of the values needed to build healthy, safe and working streets are found in these guides. Meanwhile, too many communities and practitioners have adopted practices that are high in the speed and efficiency range, and low in the safety and community building range. For this reason, there are many new guides that better inform and instruct practitioners and the public on how to build roads that work for all uses, including land use, sustainable practices, economics and the retail and social life of communities.



RESOURCES

Los Angeles County Model Design Manual for Living Streets, 2011 at http://www.modelstreetdesignmanual.com/

Smart Transportation Guidebook by New Jersey/PennDOT, 2008 at http://www.smart-transportation.com/guidebook.html

Our goal should be streets that work for everyone.

Enforcement for Pedestrian Safety

One of the most critical factors in street safety is enforcement that concentrates on intersections and corridors with high-crash rates. An enforcement program for pedestrian safety should include an evaluation of motorist, bicyclist, pedestrian and transit users to determine whether they are anticipating and accommodating one another appropriately. An enforcement program should look at whether motorists yield the right-of-way to pedestrians in crosswalks to address some of the more critical problems such as speeding, shortcuts through neighborhoods, red light running and obstructions to the pedestrian right of way such as parking.

Many drivers ignore the pedestrian's right-of-way. One extremely dangerous situation is when there are multiple travel lanes and one vehicle stops for the pedestrian crossing, and another overtakes and passes the stopped car, striking the pedestrian. Pedestrians, too, have duties to ensure the safety and comfort of other road users. There are places where they are prohibited (interstates, for example) and they must comply with traffic signals.

An enforcement program should look at pedestrian behaviors and whether pedestrians are engaging in aggressive or dangerous activities such as walking into a stream of traffic or crossing intersections against the signal and thereby disrupting the flow for car traffic.

It's also important to examine bicyclist enforcement programs aimed at curtailing problematic behaviors such as riding the wrong way in a traffic lane, riding at night without lights or required reflectors, or bicycle parking that impedes those who are traveling by car or on foot.

Compliance and enforcement activities are most often overseen by the police. In order to improve safety, health and livability, communities should increase enforcement activities around school zones and other critical areas where vehicle-pedestrian conflicts have been high or where poor yielding behaviors by motorists have been observed.

To aid in enforcing the rights of all street users, local police departments should increase the number of police officers walking and biking in the community. Additionally, cities and townships should survey the built environment and the community to determine whether streets are in compliance with 2010 ADA Standards for Accessible Design, as this often forces pedestrians to break laws just to navigate the obstructions in the built environment.

Pedestrian planning with emergency responders in Santa Barbara, CA

RESOURCES

The Uniform Vehicle Code (UVC) by the National Committee on Uniform Traffic Laws and Ordinances at http://www.ncutlo.org/

Pedestrian and bicycle safety enforcement by the District Department of Transportation and Metropolitan Police Department at http://www.mwcog.org/uploads/committee-documents/b15cXFxa20090311142525.pdf

2010 Americans with Disability Act (ADA) Compliance Standards at http://www.ada.gov/2010ADAstandards_index.htm

Safe Routes to School Programs

Safe Routes to School programs make it safer for students to walk and bicycle to school. A Safe Routes to School program will address the 5 E's: Evaluation, Education, Engineering, Encouragement and Enforcement. Other benefits might include:

- The development of walking school buses for students, with adult "bus drivers" keeping an eye on neighborhood children as they walk or bicycle to and from school.
- Classroom and active learning lessons which focus on basic pedestrian, bicycle, and motor-vehicle occupant safety and encourage children to walk and ride bicycles as a regular form of transportation.
- School trip management techniques to encourage parents, students and staff to reduce automobile trips and to use alternative modes for travel to and from schools. This can support community livability objectives including multiple transportation choices, accessibility, walkability, affordability, community interaction and reduced traffic on local streets.

Successful Safe Routes to School programs ensure that local committees have members with experience in the areas of health, engineering, education, disadvantaged communities, law enforcement, planning and recreation.

A great way to encourage Safe Routes to School is to participate in the International Walk to School Day. This is a global event where communities from over 40 countries walk and bike to school on a single day. You can join families, schools and communities around the globe as they walk and bicycle to school in celebration of Walk to School Day every October. Learn more about the day, who is participating in your area, and register for this year's event at http://www.walktoschool.org.

RESOURCES

Sample Safe Routes to School Programs from the Safe Routes to School National Partnership at http://www.saferoutespartnership.org/local/4233

Parent surveys about walking and biking to school at http://www.saferoutesinfo.org/program-tools/evaluation-parent-survey

Safe Routes to School Local Policy Guide at http://www.saferoutespartnership.org/media/file/Local_Policy_Guide_2011.pdf

In 1969, 89 percent of K-8 grade students who lived within one mile of school usually walked or bicycled to school. By 2009, only 35 percent of K-8 grade students who lived within a mile of school usually walked or bicycled to school even once a week.

Street Treatments that Support Active Transportation

The street treatments described in this section support active transportation by encouraging predictable and appropriate actions by all users. Street treatments are context-sensitive and require an understanding of local conditions and desired behaviors. This section provides definitions of treatments that will help begin discussions with transportation, public works and planning staff.

Street Treatments that Support Active Transportation

Road Diets

A road diet involves eliminating travel lanes to improve safety for pedestrians, bicyclists and motorists. Motorist crashes are typically reduced 12 to 30 percent, with some drops as high as 70 percent. High end speeds, especially, are reduced. While there can be more than four travel lanes before treatment, road diets are generally conversions of four-lane, undivided roads into three lanes—two through-lanes plus a center turn lane or median island. The fourth lane may be converted into bicycle lanes, sidewalks, planter strips for street trees, a bus stop, a separated multi-use trail, a wider outside lane or for on-street parking.

Before Road Diet

After Road Diet

Roundabouts

Vehicles using a roundabout on Route 62 in Hamburg, NY.

Roundabouts facilitate through-traffic and turning movements without requiring a signal control. Roundabouts allow vehicles to circulate around an island that is often used for landscaping, a gateway or for other decorative features, like artwork. The circulating roadway is typically wider than the approach roadways and features an additional 'apron' against the edges of the island; both of these features allow for fire trucks, ambulances and other large vehicles. Roundabouts increase intersection carrying capacity by up to 30 percent. As the only requirement for yielding the right-of-way is to traffic already in the circulating roadway, roundabouts also reduce delays for everyone.

Mini Circles

Mini Circles are one of the most popular and effective tools for calming traffic in neighborhoods. Seattle has 1,200 Mini Circles and this has led to a reduction in intersection crashes. They are the best neighborhood safety feature of any treatment type. These inexpensive features do not interrupt drainage. Mini Circles work outward from intersections on all three or all four legs of approaching traffic. Mini Circles bring speeds down to levels where motorists are more courteous to pedestrians, they allow all types of turns, including U-turns, which can assist with school area traffic management. A common engineering mistake is to put in four way stops around a mini circle. Mini Circles require yield signs instead.

A mini-circle in the Bird Rock neighborhood of San Diego, CA.

Intersection Chicane

Intersection chicanes involve curb extensions on one side of the intersection, and a median on the opposite side. This combination of treatments brings the motorist toward the center, then brings them back toward the side. This deflection path bring speeds down to the desired level. All raised areas become gardens for the neighborhood. Both sides of the intersection are narrowed, minimizing crossing distance and time. Chicanes can be used on streets with volumes as high as 12,000 daily trips. Emergency responders and transit providers prefer chicanes to more intrusive four-way stops and raised crossings.

A large vehicle being deflected through a neighborhood Intersection Chicane, Santa Barbara, CA.

Short Medians

A short median in Loma Linda, CA announces the entrance to a residential neighborhood .

Short medians help bring down speeds near schools and other places where people should be expected. Short medians are placed away from intersections, but they can be located near driveways. These inexpensive features do not interrupt drainage and they have many other advantages. They bring speeds down to levels where motorists are more courteous to pedestrians and they allow U-turns, which can assist with area traffic management. Short medians also serve as gateways, where they announce arrival at an important location, such as a school. They help put motorists on greater alert. They work well in snow cities, as well as temperate climates.

Curb Extensions

Curb extensions are a nearly universal tool for school areas. In transforming overly wide streets, curb extensions (also known as bulb outs, elephant ears and nibs) bring down right turning speeds, identify important crossings, and make it much easier for motorists to see children and for children to see motorists. When used in a series, curb extensions can significantly bring motorist speeds to acceptable levels. Curb extensions can be used at intersections, mid-block, inside of parking strips (tree wells) and other locations. Although many curb extensions are kept plain in appearance, at the entry to a neighborhood, they can be landscaped to serve as attractive gateways.

A curb extension in Birmingham, AL shortens the crossing distance for pedestrians.

Raised Midblock Crossing

Raised midblock crossings are used between intersections, typically when blocks are long, or in other locations where speeds are higher than desired, or where sight distances are poor. Raised midblock crossings have many advantages, especially due to their ability to maintain speeds at 15-20mph 24 hours a day. Raised crossings can be used in all climates, including snow country. The grade change is generally 1:16 to 1:20 when snow and ice are involved, but 1:12 in non-snow country. Color is often used. Trees and other landscaping are important for detection, and for added neighborhood acceptance.

A raised mid-block crossing in Cambridge, MA helps motorists see pedestrians in deep shadow.

Raised Intersection Crossing

The use of color and texture informs both drivers and pedestrians to anticipate one another.

Raised crossings are not only used in midblock locations, they are used at intersections. They can be used at right turn channelized island, or at regular intersections. Crossings are designed to restrict all through speeds to 15-20 mph. Raised crossings at intersections can be used in snow country. The grade change is generally 1:16 to 1:20 when snow and ice are involved, but 1:12 in non-snow country. Color is often used. Features such as bollards, paver stones, colorized concrete or colorized asphalt are often specified. Raised crossings at intersections are used widely in snow cities such as Stamford, CT and Cambridge, MA.

Raised Intersections

Raised intersections are used at intersections where roundabouts or mini-circles are not functional or practical, and where speeds need to be brought under control. They are different from raised intersection crossings, since they cover the entire intersection. This raises their value and cost considerably. Raised intersections are best constructed as new schools are built, but they can be applied to existing street sections. Raised intersections can be expensive, due to their potential to interrupt drainage. Meanwhile, they have many advantages to maintain speeds 24 hours a day. Raised intersections can be used in snow country.

Raised intersections bring speed under control and help motorists and pedestrians see each other.

Crossing Markings

Crossings should be well placed and located where there is a strong desire to cross, sight distances are good, and speeds are low. The use of materials to create attractive streetscape features can add beauty, function and a sense of place. Each functional part of a street - parking, crossings, curb extensions, lane narrowing and plantings - should be designed to add to the aesthetics, character and integrity of the street. Cities must maintain crossings and note when they become faded. Volunteers can help in this surveying effort.

Crossings must be located where there is a strong desire to cross and sight distances are good.

Crosswalk Signs

Signage allows users to anticipate one another

As a general rule, the higher the volume and speed of traffic, the more essential it is to use brighter, wider more visible and durable signing. The most recent version of the Manual on Uniform Traffic Control Devices (MUTCD), and other aids, should be consulted as a starting point. When possible, "double sign" school signs on all approaches. This can be done when medians are used, and on narrower streets, by signing both sides of the street. Sign locations are important. Place signs (and lighting) together, and place signs where they are highly visible and where you anticipate crossings.

Pedestrian Refuge Islands

Pedestrian refuge islands are one of the best tools for simplifying the crossing of wide streets. Used with curb extensions, they get pedestrians out beyond parked cars and other visual obstructions. Crossing islands are used on all categories of streets, and they have their highest return on investment when they create more courteous yielding behaviors by motorists. Well designed crossing islands achieve yielding rates above 80 percent. Many other tools, like Rapid Flash Beacons, or raised crossings, are used when it is necessary to increase yielding behavior.

Pedestrian refuge islands buffer pedestrians from traffic, allow crossing in stages and angle pedestrians correctly to face traffic.

Street Treatments that Support Active Transportation

Signalized Intersections

Intersection control devices are critical if walking, bicycling and motoring are to work, and work together. People who cross at intersections, when they are signaled to do so, are most predictable. Drivers appreciate predictable and compliant behavior. When intersections become so complex and challenging that signals are added, there is often ample justification to go beyond conventional standards to address the needs of people walking and bicycling. Signal timing should be automated for inclusion of walking cycles. Signal timing should be adjusted so that signals recall to WALK during the cycle, minus the clearance interval.

Signals should recall to WALK during the cycle and instruct pedestrians on crossing times.

Bike Lanes

Bold striping and markings remind drivers that bicyclists should be expected on the road.

One of the most cost effective ways to reduce speed while improving overall vehicular flow and creating improved conditions for bicycling and walking, is the conversion of overly wide roads to bike lanes. Generally, travel lanes can be reduced to 10 feet. Narrower travel and storage lanes are proving to be slightly safer. Motorists appear to become more attentive when lanes are narrowed from 11-12 feet to 10 foot travel lanes. Bike lanes should be at least 5 feet wide and seamless. Thick striping and regular markings remind drivers to anticipate bicyclists. Bike lanes have an added benefit to pedestrians in that they provide a buffer to moving traffic.

Plazas, Parks and Paseos

Transforming a street, sidewalk, plaza, square, paseo, open lot, waterfront or other space into a community source of distinction, brings joy to the community. Good places make good experiences possible and they have consequences in our lives. People want to be in attractive, well designed and cared for public places. Investment in streets and other public spaces brings added value to all buildings and homes in an area. A compelling sense of place allows the time spent there to be rewarding and memorable. Converting alleys, sidewalks and streets into pocket parks, plazas and paseos creates lively places for people to gather, celebrate, eat and enjoy being together.

Madison, WI provides outdoor eating areas even on its busiest streets around the State Capitol.

Sidewalk Design

Sidewalks require high levels of design and care. It is within the protected spaces of a sidewalk where people move freely, but also spend time engaging others and enjoying their public space. Sidewalks work best when they are fully buffered from moving traffic. Color, texture, street furniture and other materials can distinguish functional areas of sidewalks. Using saw cuts rather than trowel cuts provides a better surface for wheelchairs and wheeled devices. Sidewalks have three parts: the shy zone, furniture zone and the walk/talk zone. If driveways must interrupt, keep these to minimal widths (14 feet for one way and 26 feet for two way). Use contrasting colors and materials and keep sidewalks fully flat across driveways.

Sidewalks have three parts: the shy zone, the furniture zone and the walk-and-talk zone.

Snow Removal

Sidewalks and bike lanes should be cleared when streets are cleared as in Hamburg, NY.

Winter cities need strategies and equipment to properly maintain sidewalks, ramps and crossings under storm conditions. Although most communities require individual property owners to maintain their own sidewalks, this is unreliable, at best. Hamburg, NY has the right equipment and commitment to keep sidewalks cleared. Cities with lighter and more occasional snow may want to create a volunteer assistance program that works. In all cases, when streets are being cleared, sidewalks and bike lanes should be cleared too and should never be storing ground for snow removed from the streets.

Tree Wells

Sometimes a building to building right-of-way is too tight to plant trees in sidewalk areas. Use of in-street tree wells can allow the street to be "greened" and often without removal of parking. Tree wells can either be installed to allow water to flow naturally in existing channels, or if a complete reconstruction is needed, to insert drainage in a pattern that supports trees. Tree wells are used on many local streets but can also be used, along with curb extensions, on main streets. Use of tree wells and curb extensions, in combination, helps bring speeds to more appropriate urban levels. There are 22 benefits to street trees: http://tcstreetsforpeople.org/node/116

Tree wells in the Town of Tioga, FL, provide shade and inset parking.

On-Street Parking

On-street parking can be head-in, head-out or parallel. It takes less space than off-street parking.

On-street and inset parking visually narrows streets and brings down traffic speeds, while providing the most sustainable and affordable parking. Speeds are brought down even more when tree wells are used to provide a canopy to the street. Since it already has its own turn radii into each spot and access, on-street parking only takes up one-third of the land of off-street parking. But the primary reason for maximizing parking on street is to help civilize streets that were overbuilt for speed. On-street parking belongs on center city streets, serving as a buffer between pedestrians and moving cars as a natural traffic calming tool.

Head-Out Angled Parking

Head-out angled parking maximizes use of adjacent land, since off-street parking takes up three times more space than on-street parking. It also takes up less road space since adjacent lanes can be 10 to 11 feet wide. When head-out angled parking is used, lane widths can be much narrower, since back out "discovery time" is not needed. Also, the back end of vehicles have more overhang, so less space is used for the parking bay. Parking bay depths should be 15 feet. An added two foot of space is picked up when valley gutters are used. Learn the benefits of head out angled parking here: http://vimeo.com/35268340

Motorists can see bicyclists, motorists and pedestrians with head out angled parking.

Resources

Communities sometimes struggle with how to create streets that are "complete," and that are walkable and more supportive of active living. The street treatments in this section provide benefits to all users, but for more information and for additional treatments, see the Los Angeles County Model Street Design Manual for Living Streets at: http://www.modelstreetdesignmanual.com/.

The manual explains key principles and practices to support active transportation, including best practices from around the world. Most importantly, it reminds us that transforming streets to accommodate all users adds immense value.