Engineeering Treatments and Strategies
School area speed limit signing
School crosswalk signs and advance warning signs
Parking regulations

NO PARKING
7:00 AM
4:00 PM
SCHOOL DAYS
Sample school traffic control plan
Engineering topic outline

- Around the School
- **Along the School Route**
  - Sidewalks
  - On-street bicycling
  - Pathways
  - Connectivity
- Crossing the Street
- Slowing Down Traffic
Sidewalks are essential
Sidewalk design criteria

Connect all sidewalks in the school walking route

Accommodate pedestrian desire lines outside of splash zones

Splash zone
5’ to 6’
Provide sidewalk buffers
No sidewalk buffer
Good sidewalk buffer
Provide wide enough sidewalks

- **Recommended minimum:** 5’
- **Preferred min:** 6’
- **At schools:** 8’-10’
Maintain landscaping to provide clear walkways and sight distances

Trim down to the ground
Remove obstacles from sidewalks
Install street lighting
Meet ADA requirements for universal design
Curb ramp design

- Two ramps per corner
- Eight ramps per intersection
Limit driveway crossings
Connections to the school
Don’t build driveways like intersections
Build driveways like driveways
Install bicycle racks
Connectivity creates a pedestrian-friendly street system

- Reduces walking distance
- Offers more route choices – disperses traffic
- Less traffic = more pedestrian friendly
Connectivity can reduce walking distances and crossings required
Engineering topic outline

- Around the School
- Along the School Route

- Crossing the Street
  - Introduction
  - Shortening crossing distances
  - Marking crosswalks
  - Creating visible crossings
  - Using stop signs and traffic signals

- Slowing Down Traffic
Principles for creating safe crossings

- Establish a school crossing
- Reduce crossing distance
- Use appropriate traffic control
  - Marked crosswalks
  - Warning signs or flashers
  - Stop signs and traffic signals
  - Crossing guards
- Slow vehicle speeds
Wide, multi-lane roads are barriers
School walking routes and big roads do not mix
Pedestrian and bicycle bridges

- Expensive
- Often not used
- Consider topography and circumstances
Pedestrian underpasses and bridges
Tools to reduce crossing distance
Curb extensions at crossings

Reduce the crossing distance
Crossing islands
Two-stage crossing island
Road diet – watch it happen
Road diet – watch it happen
Road diet – watch it happen
Marking crosswalks
Why install marked crosswalks?

- Indicate a preferred pedestrian crossing location
- Alert drivers to an often-used pedestrian crossing
- Indicate school walking routes
This crosswalk meets guidelines
Install high-visibility markings

Ladder-style is easier to see.
What the pedestrian sees
What the driver sees (same crosswalk)
In-street signing

![In-street signing signs and a photograph of a pedestrian crossing](image-url)
In-pavement flashing crosswalks

- Possible maintenance problems
- Visible primarily at night
- Unknown crash effects
- Expensive treatment
“Multiple threat” crashes

1\textsuperscript{st} car stops to let pedestrian cross, blocking sight lines

2\textsuperscript{nd} car doesn’t stop, hits pedestrian at high speed
Solution: Advance stop/yield line

1\textsuperscript{st} car stops further back, opening up sight lines

2\textsuperscript{nd} car can be seen by pedestrian
Parking restrictions at corners

Better visibility for both drivers and pedestrians
Modify traffic signal timing
Traffic signal guidelines

- Mark all crosswalks where pedestrians cross
- Pedestrian signals in all directions
- Adequate crossing time for pedestrians
- Stop bars for vehicles on all approaches
Engineering topic outline

- Around the School
- Along the School Route
- Crossing the Street
- Slowing Down Traffic
Slowing down traffic
High speeds increase stopping distance
High speeds increase pedestrian injuries

**PEDESTRIAN INJURIES AT IMPACT SPEEDS**

- **40 MPH**
  - 85% death
  - 15% injured

- **30 MPH**
  - 45% death
  - 50% injured
  - 5% uninjured

- **20 MPH**
  - 5% death
  - 65% injured
  - 30% uninjured
Correct design invites correct use

Which street has lower speeds?
Narrow lanes reduce speeds

Use paint to reduce lane width
Speed humps slow traffic on local streets
Raised pedestrian crosswalks
Raised crossings in school parking lot
Roundabouts are safer

“Results of this study indicate that converting conventional intersections from stop sign or traffic signal control can produce substantial reductions in motor vehicle crashes.”

March 2000 Study by the Insurance Institute for Highway Safety
PEDSAFE

Pedestrian Safety Guide and Countermeasure Selection System

The Pedestrian Safety Guide and Countermeasure Selection System is intended to provide practitioners with the latest information available for improving the safety and mobility of those who walk. The online tools provide the user with a list of possible engineering, education, or enforcement treatments to improve pedestrian safety and/or mobility based on user input about a specific location. [read more]

Available Tools:

Selection Tool – find appropriate countermeasures on the basis of desired objectives and specific location information.
Interactive Matrices – view the countermeasures associated with crash types and performance objectives.
Countermeasures – read descriptions of the 49 engineering, education, and enforcement treatments.
Case Studies – review real-world examples of implemented treatments.

Resources:

Background – understand what is needed to create a viable pedestrian system.
Crash Statistics – learn about the factors related to the pedestrian crash problem.
Crash Analysis – learn how crash typing can lead to the selection of the most appropriate countermeasures.
Objectives – learn how selected treatments may address many requested improvements to the pedestrian environment.
Implementation – read about the necessary components for implementing pedestrian treatments.
More Info – access additional information through a variety of resources.
Downloads – access print versions of the guide and other relevant materials.
Summary

1. Focus first on easy-to-implement and low-cost solutions

2. Also identify and program longer-term improvement needs (e.g. sidewalks)

3. Match the treatment to the type of problem
Summary

4. Provide and maintain facilities along the school route:
   - Sidewalks
   - On-street bicycle facilities
   - Paths
   - Connections
   - Pedestrian and bicycle bridges
Summary

5. Provide safe street crossings:
   - Keep it simple
   - Shorten crossing distances
   - Carefully select crossing locations and marked crosswalks
   - Create visible crossings

6. Slow down traffic speeds