

A GUIDE TO DEVELOPING SAFE ROUTES TO SCHOOL MAPS



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GLOSSARY

- 🚶 Bike lane: a portion of the roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings, and, if used, signs.¹ This facility directs cyclists to bike with traffic.
- 🚶 Continental crosswalk: a crosswalk consisting of a series of wide stripes parallel to the curb for the length of the crossing.² These are typically striped in an effort to increase driver visibility.
- 🚶 Parallel crosswalk: a crosswalk consisting of two parallel lines usually perpendicular to the curb.
- 🚶 Pushbutton: a button to activate a device or signal timing for pedestrians, bicyclists, or other road users.¹
- 🚶 School biking boundary: the designated area around a school within which administrators, parents, and/or municipal staff determine is safe and reasonable for children to bike to and/or from school. A generally acceptable distance is 1.5 miles, and should consider natural and manmade barriers.
- 🚶 School walking boundary: the designated area around a school within which administrators, parents, and/or municipal staff determine is safe and reasonable for children to walk to and/or from school. A generally acceptable distance is 1 mile, and should consider natural and manmade barriers.
- 🚶 School footprint: the outline of a school; used on a map to make it easier for families to find building entrances.
- 🚶 Trail (i.e. shared-use path): an off-street facility shared by cyclists, pedestrians, and other non-motorized users traveling in both directions, generally recommended to be at least 8 feet wide.³



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BACKGROUND

1.0 Purpose

According to the National Center for Safe Routes to School (NCSRTS):

A **school route map** informs each student of the safest, most convenient, and most accessible walking and bicycling route to school. It can also identify areas along the student's route that require improvements to make the route safe.⁴

Safe Routes To School maps, or *Safe Walking Route Maps*, can show students, families, and school personnel where the safest routes to walk and bike to school are using sidewalks, crosswalks, trails, crossing guards, school bike rack locations, and traffic signals.

Encouraging walking or biking to school can increase student energy levels, making children more alert in the classroom.^{5,6} Children should also get a minimum of 60 minutes of exercise a day,⁷ and based on a walking rate of 20 minutes per mile, walking one mile to and from school fulfills 2/3 of that recommended time. Childhood obesity is currently a major problem in the United States, and 20.7% of Illinois children are obese.⁸ Getting children to walk to school can create lifelong healthy habits.

Many school districts are also facing school transportation budget cuts for busing. One way to deal with fewer school bus routes is to implement Walking School Buses on safe walking routes, which allow children to walk further distances to the bus stop or school with the safety of other adults and kids. Kids who walk and bike also have the opportunity to learn and practice pedestrian & bike safety skills at an early age.

Children walking and biking also reduces the number of family vehicles and buses driving to and idling on school property, which improves air quality at the school. Less fuel consumption can also save families money.

Finally, walking and biking to school fosters social interaction. Parents walking with their children can prepare them for the schoolday or ask them how their schoolday was; kids walking with other kids increases their social development; and families can get to know their neighbors along walking routes, thus increasing neighborhood safety.

2.0 Audience

Students, parents, teachers, and other school personnel will be reading and using your map(s), so don't clutter it with too much information, or unorganized information. Elementary students, especially, need to be able to clearly determine how to get to school safely. Clear maps will also help parents trust using these routes.



PROCESS

3.0 Partners

When developing your Safe Routes To School maps, identify what entities you will need information from, and who is willing to help. If you have a School Travel Plan team, start there. Potential partners include:

- School District (school board, staff)
- School (students, staff, faculty, parents/families, community members)
- Parent-Teacher Association (PTA)
- Local SRTS group
- Local bike club
- Municipality (City, Town, or Village government; planning, engineering, police, etc.)
- Park district
- Township Supervisor
- County Engineer
- Regional Planning Commission (RPC)
- Metropolitan Planning Organization (MPO; this may be your RPC)
- IDOT (district office)

3.1 Public Participation

There may be multiple entities interested in doing some of this work. Students may already know what routes they frequently walk, or what routes feel safest. Parents and school personnel may already have ideas of student walking patterns, or know what routes they want to encourage students to walk. Take this information into consideration at the beginning of the map-making stage. This will make it easier to get an idea of where safe routes will be placed. The data collection stage can also show whether routes preferred by students, parents, and/or school personnel are the safest or not.

You can also use surveys to determine walking origins, destinations, routes, habits, and issues. Walkabouts and bikeabouts can also be conducted around the school and/or neighborhood.



4.0 Elements

There are many potential elements you can add to your map. Include what is appropriate for your school walking boundary.

General:

- 1) **Streets.** Names should be clearly labeled.
- 2) **Alleys**
- 3) **Railroads**

Pedestrian facilities:

- 1) **Sidewalks** (on-street, off-street)
- 2) **Crosswalks**
- 3) **School walking boundaries**, if available.
- 4) **Park district paths**, if available. These paths may not be as wide as trails, but they are useful to show connectivity to sidewalks between homes and schools.

Bike facilities:

- 1) **Bike facilities** (e.g. trails, bike lanes)
- 2) **School bike rack location(s)**

Crossing facilities:

- 1) **Crossing guards**
- 2) **Traffic signals** (stoplights)
- 3) **Pedestrian pushbuttons**
- 4) **All-way stops**

School information:

- 1) **School icon**
- 2) **School footprint** (outline of the school) – can be traced in GIS if you have aerial photography of your neighborhood.
- 3) **Inset.** If your school walking boundary is large, an inset may be necessary to see the safe walking routes within a block or two of the school.



4.1 Non-Field Elements

First collect the map elements that do not require fieldwork. These may include:

- **Streets & Alleys** (potential resources: municipality, county, MPO)
- **Railroads** (potential resources: municipality, county, MPO)
- **School walking boundaries** (potential resources: school district, municipality)
- **Park district paths**
- **Bike facilities** (potential resources: municipality, MPO)
- **Crossing guards** (potential resources: local police department, school district)
- **Traffic signals** (potential resources: municipality, MPO, IDOT)
- **School icon** (potential resources: school district, municipality)
- **School footprint** (potential resources: school district, municipality, GIS, online map)

The following information can be collected for scoring purposes (see Section 5.0), but do not need to be mapped:

- **Number of lanes**
- **Crosswalk type**
- **Traffic control device actuation**

4.2 Field Elements

After gathering all non-field data, collect the map elements that require fieldwork. You can print a map of your school's neighborhood, mark these elements on the paper map, then digitize the data using GIS. Another option for collecting point data is to use a GPS unit, then enter it in GIS.

This can be done using any of these potential resources:

- **Planner**
- **Engineer**
- **Intern**
- **Volunteer**
- **Student**
- **Staff**
- **PTA member**

The data that may require field collection may include:

- **Sidewalks**
- **Crosswalks**
- **School bike rack location(s)**
- **Pedestrian pushbuttons**
- **All-way stops**

The following information can be collected for scoring purposes (see Section 5.0), but do not need to be mapped:

- **Speed limit signs**
- **Pedestrian-related signs**



5.0 Scoring

Once all of your map data has been collected, it's time to evaluate your school's neighborhood walkability. One of the most important tasks of creating Safe Walking Route Maps is developing a fair, rational way to determine the actual safe routes. CCRPC uses the following scoring elements, evaluating each block in each school walking boundary. 20 points is the highest possible score. Select the appropriate elements to create your scoring system.

Roadway:

1) Sidewalks

- a) Yes=1
- b) No=0

2) Speed limit in the vicinity

- a) 20 MPH posted=4
- b) 25 MPH posted=3
- c) 30 MPH posted=2
- d) 35 MPH or more posted=1
- e) Not posted=0

3) Traffic Volumes

- a) ADT <1,000=3
- b) ADT 1,001-5,000=2
- c) ADT 5,001-10,000=1
- d) ADT >10,000=0

4) Pedestrian-related signage

Are there any signs related to pedestrians or school crossings?

- a) Yes=1
- b) No=0

Intersection/Crossing:

5) Number of lanes crossed

- a) 1 lane=4
- b) 2 lanes=3
- c) 3 lanes=2
- d) 4 lanes=1
- e) 5 lanes or more=0

6) Crosswalks

- a) Continental=2
- b) Parallel=1
- c) Unmarked=0

7) Traffic controls at intersection

- a) Traffic signal (pre-timed)=2
- b) 4-way Stop=2
- c) 2-way Stop=1
- d) Traffic signal (actuated)=1
- e) No traffic control device=0

8) Traffic control device

- a) Traffic signal (pre-timed)=2
- b) Traffic signal (actuated)=1
- c) Stop sign=1
- d) Other traffic control device=0

9) Crossing Guards

- a) Adult crossing guard at crossing=1
- b) No crossing guard=0



6.0 Safe Routes Selection

Once all segments have been scored, you can match it to the school neighborhood map, write the scores on the school neighborhood map, or enter this data into a GIS shapefile to compare with your school neighborhood map. Using the scoring, existing pedestrian and bike facilities, and public participation, determine which routes are safest for your students to walk and bike to school. Remember to think of safety in terms of the built environment, vehicle issues, and personal safety.

Figure 6.1: Student mapping activity in Columbia, MO⁹



Figure 6.2: Adult mapping activity in Columbia, MO⁹





7.0 Map Creation

Once all data has been collected and safe routes determined, it is time to create the map. CCRPC uses GIS software to create the map, although some online map tools may suffice (e.g. Google Maps, Bing Maps, MapQuest).

7.1 Map Layout

Your map layout may want to include the following elements:

- Title
- School name
- School address
- Agency logo
- North Arrow
- Scale Bar
- Legend

7.2 Map View

Focus your map view on the neighborhood around the school. If you have a school walking boundary, focus the map on that area. If not, one mile is a generally acceptable walking distance to school, and this distance may be a more appropriate map view for elementary schools. 1.5 miles is a generally acceptable biking distance to school, and this distance may be a more appropriate map view for middle schools. Figure 7.1 shows a Safe Walking Route Map with a school walking boundary, and Figure 7.2 shows a Safe Walking Route Map without a school walking boundary.

7.3 Symbolization

Once all data is digitized, add it to your map, and symbolize the data. CCRPC uses red lines for sidewalks to make them stand out, and thicker lines for trails to show that they are wider and/or multi-use.

You can create a point shapefile for the actual safe routes, and symbolize these with arrows. ArcGIS Version 9.x allows you to rotate the arrows in the direction that you want children to walk to school. This can be done by following these steps:

1. Create a point shapefile in ArcCatalog. CCRPC titles these shapefiles "<School Name>_arrows."
2. In the shapefile, open "Properties," select the "Fields" tab, and create a field titled "Rotation."
3. Add this shapefile to ArcMap.
4. Open "Properties."
5. Select the "Symbology" tab.
6. Select "Features – Single Symbol."
7. Make the symbol a **north-facing arrow**.
8. Under "Symbol," there is a drop down menu titled "Advanced." Select "Rotation."
9. Under "Rotate Points by Angle in this Field," select "Rotation."
10. For "Rotation Style," select "Geographic."
11. Click "OK" through the dialog boxes.
12. When editing this shapefile, enter the angle you would like each arrow to face in the "Rotation" field:
 - a. 0=arrow will face north
 - b. 90=arrow will face east
 - c. 180=arrow will face south
 - d. 270=arrow will face west



Figure 7.3 shows a Safe Walking Route Map with point arrows.

You can also digitize safe routes as a linear shapefile, showing continuous lines with arrows on a map. Figure 7.4 shows a Safe Walking Route Map with linear arrows.

Don't clutter your map with too much symbology. Section 2.0 explains the reasoning for this.

The following elements can be digitized as point shapefiles:

- Safe Routes
- Bike Racks
- Crossing Guards
- Traffic Signals
- Pedestrian Pushbuttons
- All-Way Stops
- School Icons

The following elements can be digitized as line shapefiles:

- Streets
- Alleys
- Railroads
- Sidewalks
- Crosswalks
- Park district paths
- Bike facilities/trails

The following elements can be digitized as polygon shapefiles:

- School walking boundary
- School footprint

7.4 Final Product

Once your map(s) are complete, export them to PDF. In ArcGIS, use File, Export Map, then choose a file name and folder to save them in. See any of the preceding figures in this document for an example of a final map.

7.5 Additional materials

If you are creating a booklet, you may want to add materials to the beginning of the document. These may include pedestrian and bike safety tips for kids, methodology, and/or school walking/biking rules. School rules may also be placed in the map if there is sufficient space, as shown in Figure 7.5.

You may also want to include a contact information page, listing school addresses, phone numbers, and principal names; as well as the school district office contact information.



Figure 7.1: SRTS Map with a school walking boundary, Urbana, IL

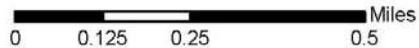
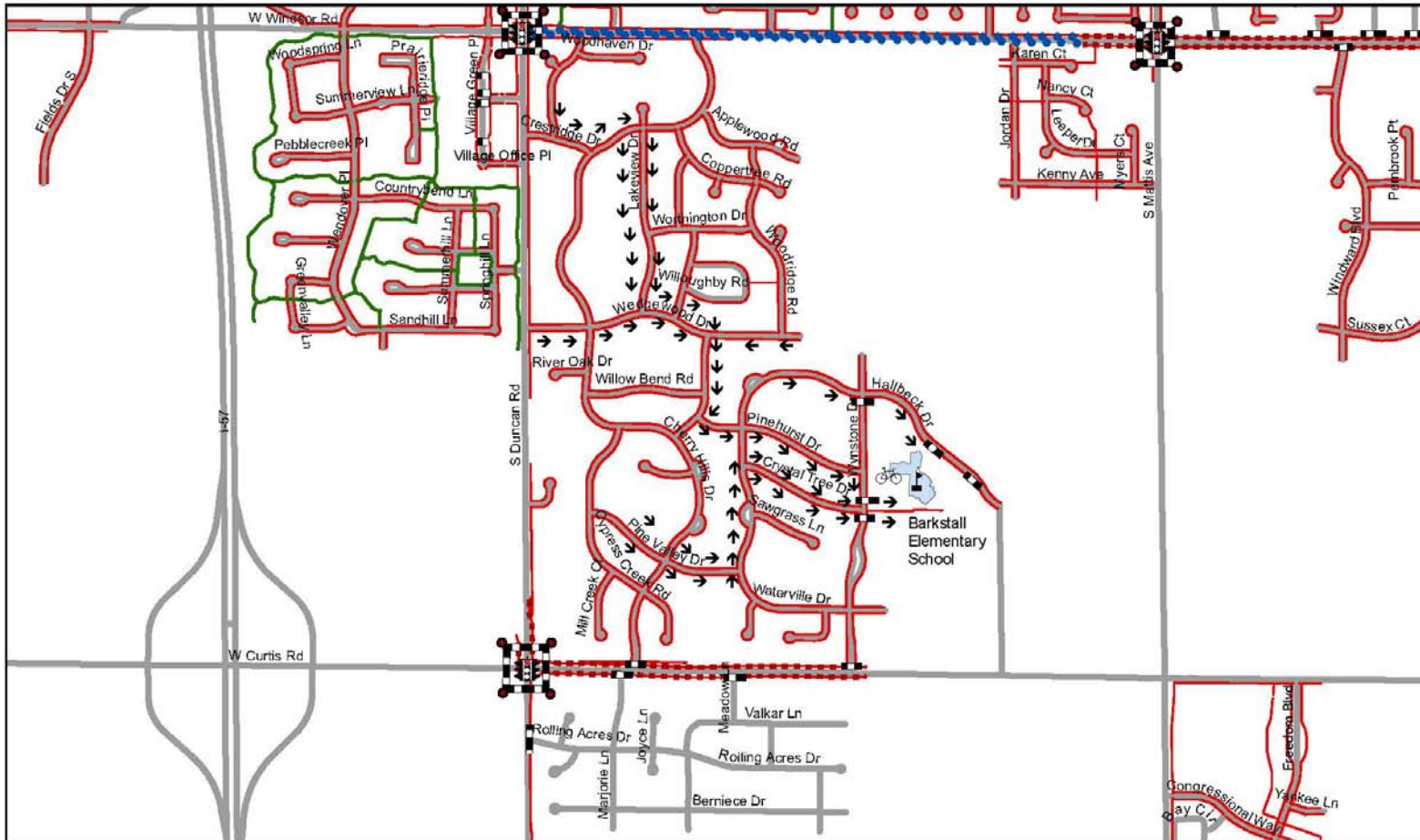


Figure 7.2: SRTS Map without a school walking boundary, Champaign, IL



Safe Walking Route Maps 2009

Barkstall School
2201 Hallbeck Drive
Champaign, IL 61822



Legend

- Sidewalks
- - - Bike Lanes (on-street)
- Crosswalks
- . - . Divided Shared-Use Path (off-street)
- Safe Routes
- Shared-Use Path (off-street)
- Bike Racks
- Streets
- Barkstall Elementary School
- Traffic Signal
- Pedestrian Pushbutton



Figure 7.3: SRTS Map with point arrows, Urbana, IL





8.0 Map Distribution

The next step is to distribute your map(s).

8.1 Timing

The timing of map distribution may be more important than how they are distributed. If possible, you may want to begin the map creation process in the spring or summer, gathering community input, data, and creating the maps, so that they are completed for distribution just before the school year begins. If possible, it would be ideal for them to be included with registration materials, so that families can plan their safest route to school before the school year begins. As the school year progresses, children and families will become more familiar with their route, and may be comfortable participating in International Walk To School Day in October.

8.2 Distribution

Once maps have been finalized, they can be distributed in a variety of ways. A sustainable and technologically savvy distribution method is to post them online. This can be on a municipal, RPC, MPO, school, and/or PTA website. It may be beneficial to post them in multiple places depending on your targeted audience. All websites could have a link to one website, where the maps are stored. Maps can also be posted individually, by district, and/or as an entire booklet, so that families can take the information they need.

Paper maps can also be distributed. This makes it easier for families to immediately take the map outside and try walking the route. This also provides equitable access of maps to all families, not just those with Internet access.

Paper maps can be made available to families at school, district,

municipality, RPC, MPO, and/or county offices. Printed copies can be left at a front desk, or printed upon request (to be environmentally friendly). Paper maps can also be distributed at school registration days, open houses, PTA meetings, parent/teacher conferences, and/or other school events.

8.3 Other Languages

Your school and/or community may have a significant population whose first language is not English. If so, you may want to translate your maps into another language. You can also make the map bilingual, or provide contact information for families to call someone to have the map translated. Figure 8.1 is an example of a Safe Walking Route Map from Phoenix, AZ in English and Spanish. These methods may build trust and understanding between non-English speaking populations and the community.

9.0 Updates

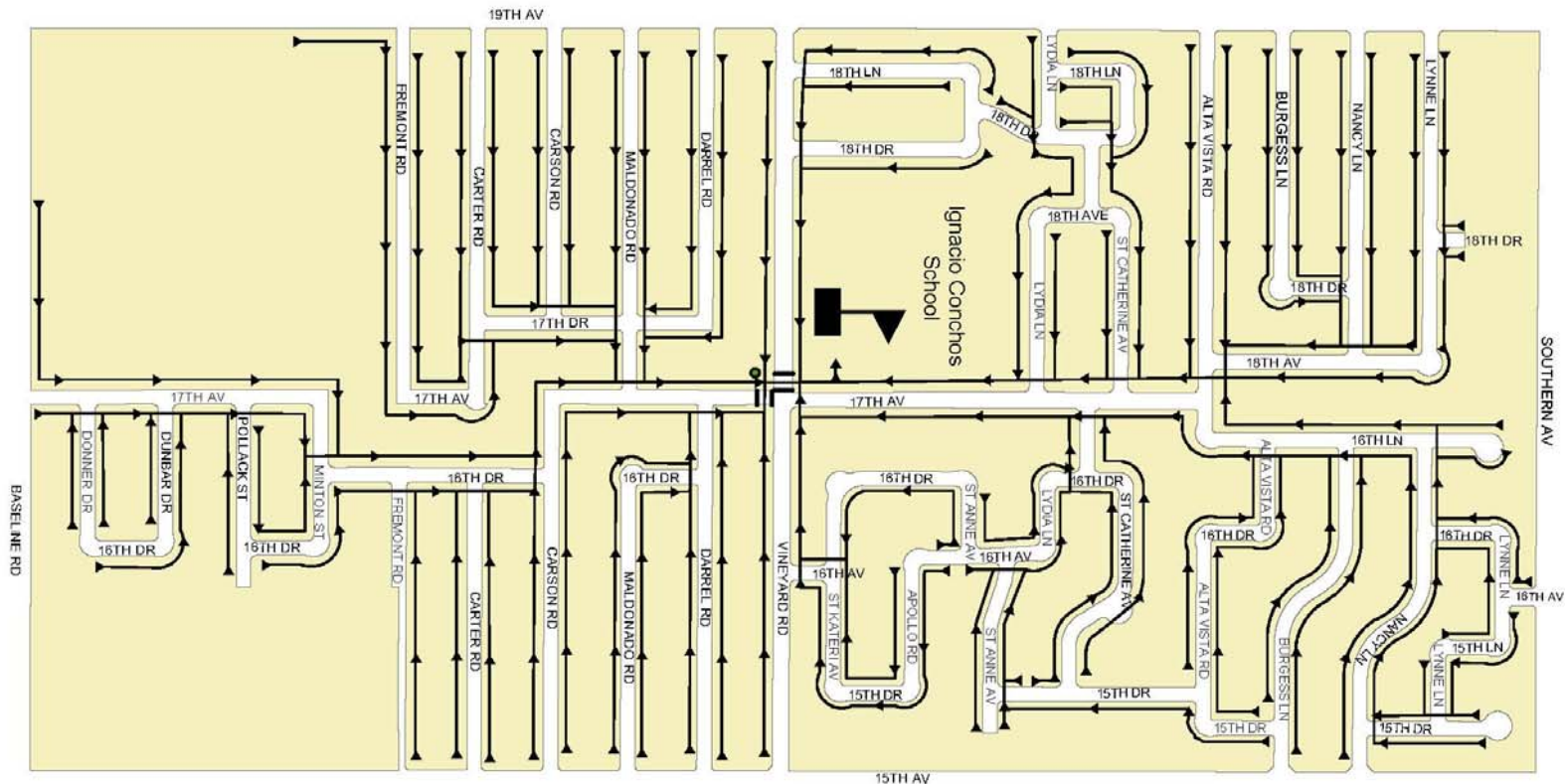
As new facilities are installed, safe walking routes may change. You may plan to update your maps on a pre-determined, regular basis. CCRPC aims to update its maps every other summer. However, individual maps can be amended in between updates to show new safe routes based on new sidewalks, crosswalks, traffic signals, crossing guard locations, or other changes. Figures 9.1 and 9.2 show Safe Walking Route Maps after a regularly scheduled update, and an amended map after two new blocks of sidewalk were installed, respectively. The new sidewalk changed the safe walking route.

Map preparers should work with school administrators and/or other interested parties (see Section 3.0) when amending maps. Be sure to publicize and redistribute your new maps to the appropriate audiences (see Sections 2.0 & 8.2).



Figure 8.1: Bilingual SRTS Map, Phoenix, AZ

Ignacio Conchos School Safest Route to School Walking Plan La Ruta Mas Segura para Caminar a la Escuela



Follow the solid line in the direction of the arrows to get to school.
Siga la linea en la direccion de la flecha para llegar a la escuela.

Created 2/27/2008 by gjn

Figure 9.1: SRTS Map after regular update, Champaign, IL

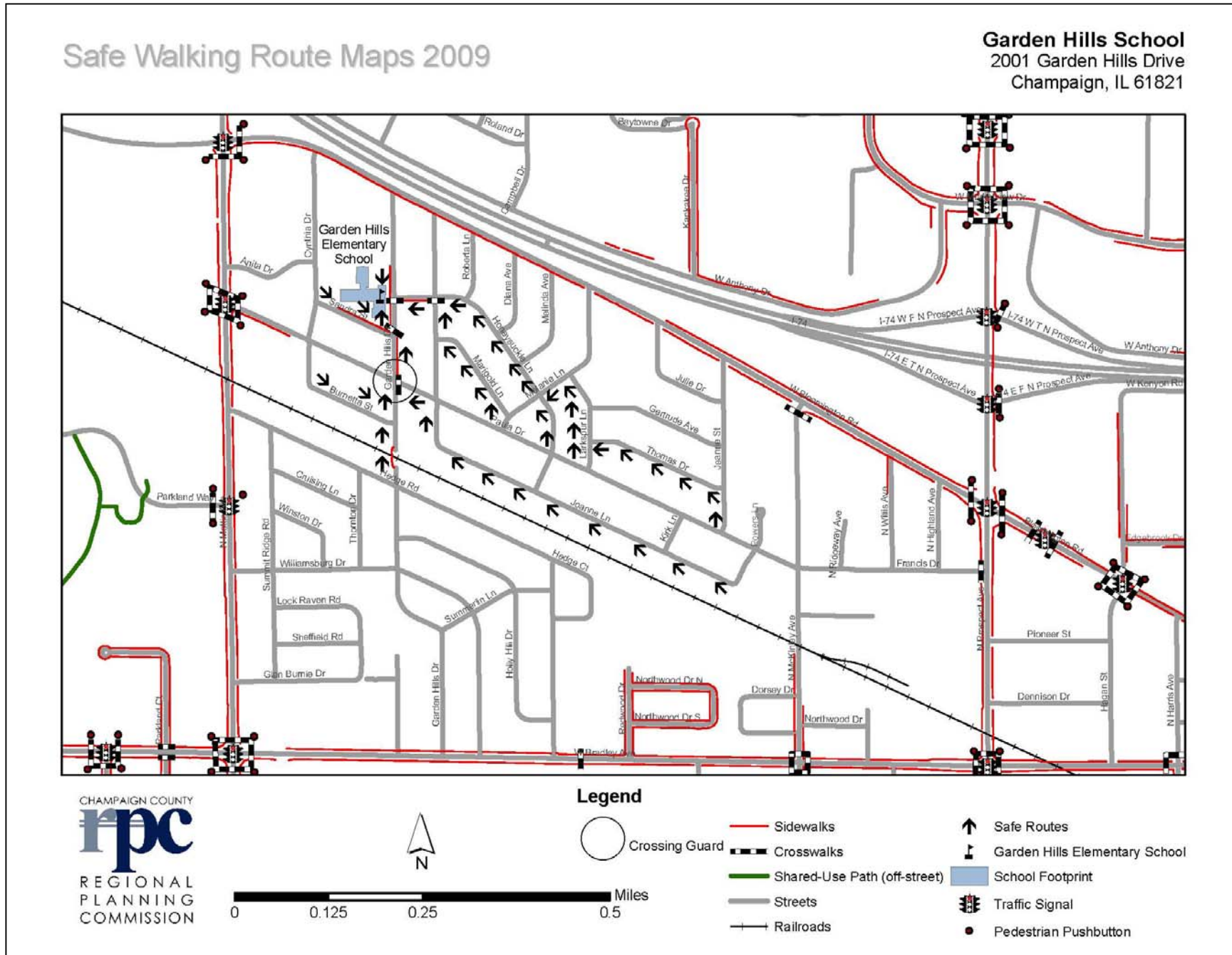
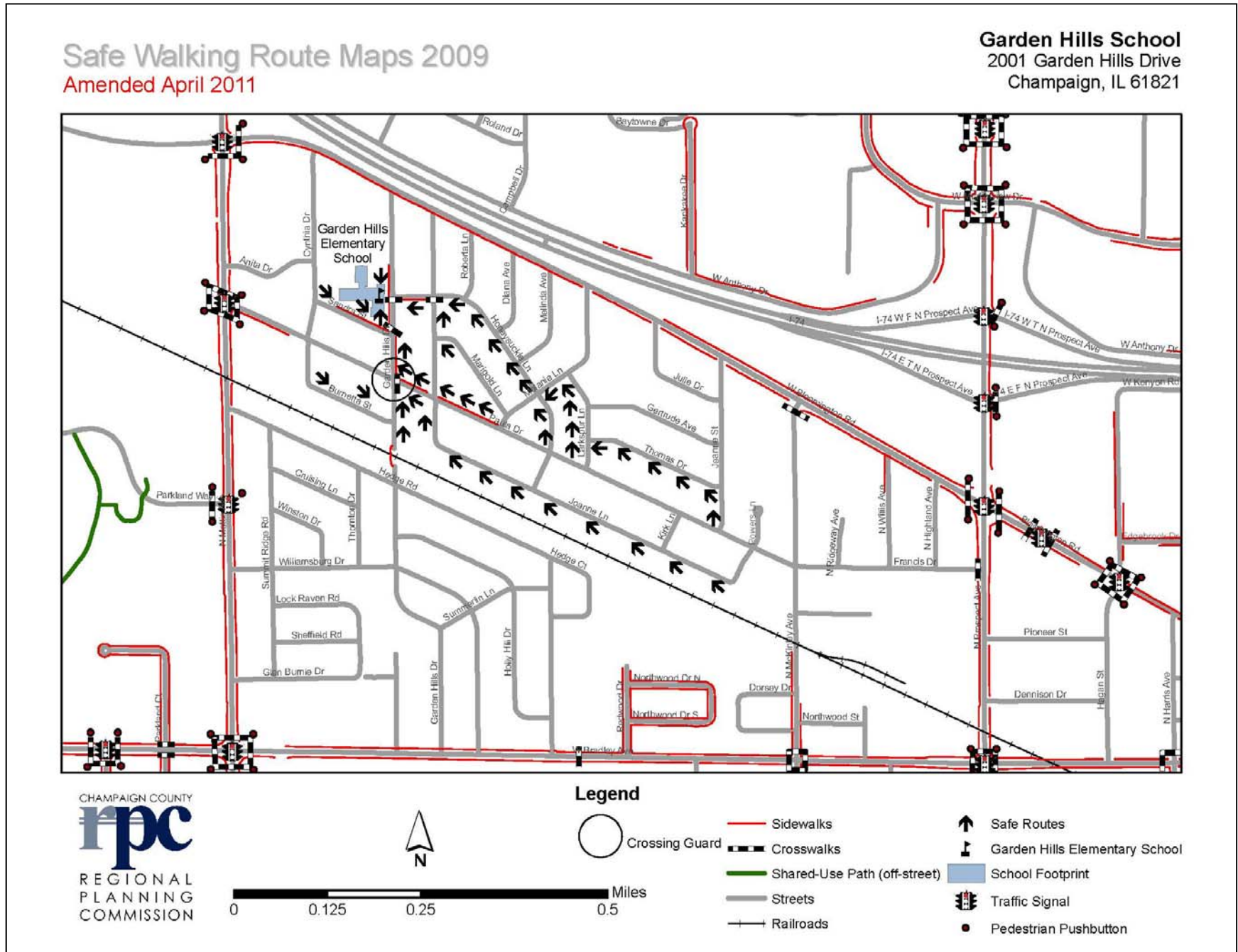




Figure 9.2: Amended SRTS Map, Champaign, IL





RESOURCES

10.0 Additional Resources

You can find more information about Safe Routes To School and Safe Walking Route Maps here:

- **Champaign County Regional Planning Commission (CCRPC)**
Champaign-Urbana Safe Walking Route Maps: <http://www.ccrpc.org/transportation/safewalking.php>
- **Illinois Department of Transportation Safe Routes To School (IDOT SRTS) homepage:**
<http://www.dot.state.il.us/saferoutes/SafeRoutesHome.aspx>
- **National Center for Safe Routes To School (NCSRTS):** <http://www.saferoutesinfo.org/index.cfm>
- **Safe Routes to School National Partnership:** <http://www.saferoutespartnership.org/>
- **America Walks:** <http://americawalks.org/>

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