# *Safe Crossings*

## Common Core Standard

G.CO.C.12 Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.), i.e. *constructing perpendicular lines, constructing a line parallel to a given line through a point not on a line.*

G.MG.A.3 Apply geometric methods to solve design problems.

*Common Core Geometry, Unit 1*

MP1: Make sense of problems and persevere in solving them.
MP4: Model with mathematics.
MP5: Use appropriate tools strategically.
MP6: Attend to precision.

## The Task

Metropolitan High School is located on a major road with several lanes of traffic. It is close to many neighborhoods where a large number of its students live on the other side of the road, and most of those students walk to school instead of riding a bus. The principal has received calls recently from many parents with safety concerns about students who have to cross the street in rush hour traffic. The parents are asking that a walking bridge be built over the road to connect the residential area to the school.

You have been asked to serve on a task force to develop a proposal to send to the superintendent requesting that the bridge be built. Your specific task is to construct a bridge that is perpendicular to the existing sidewalk on the residential side connecting to some point the on the school side. You must also construct a sidewalk in front of the school that is parallel to the existing sidewalk on the other side of the road. Your constructions must be shown on the document provided that shows a map of the school and road. This document will be included in the proposal to the superintendent as a part of the recommended construction plan. So get to work: time is of the essence where safety is concerned!

## Facilitator Notes

1. Students should be given access to multiple tools, as listed in the standard.
   Options for grouping and use of tools:
   - Assign groups or partners and give every group access to all possible tools.
   - Assign groups or partners to specific tools, and have them present how their tool was used for the construction.

- Allow groups or partners to use the tool of their choice, and then require them to do the construction a second time with a different tool.
- Allow students to complete the constructions with as many different tools as they can within the times allotted.

2. Have groups share how they used specific tools in the construction process. Give students a chance to take notes and/or try tools to which they were not yet exposed. If there is a tool that no one chose or that everyone struggled to utilize, complete the construction together as a class using that tool. Compare the tools, discussing the pros and cons of each as a class.

## Follow-Up Questions

1. How did you complete your construction? Which tool was the easiest to work with?
2. How do you know your roads are parallel to each other?
3. How do you know your bridge is perpendicular to the sidewalk?
4. Is your bridge perpendicular to both sidewalks? How do you know?

## Solutions