



# Primer for Pedestrian Safety STEM Activities

The streets and transportation network are intended for members of the community of all ages, abilities, and social backgrounds. Everyone should be able to make it to their destination safely as they go about their daily lives. There are many practical ways to improve streets and transportation to keep people safe and comfortable whether on foot, bike, using a mobility device, or in a motorized vehicle. Whether pedestrian safety is already an integral part of your work or the topic is somewhat new to you, conducting these activities is a great chance to introduce transportation design and road safety to young people. It is also a chance to let them know why this work is important and what roles they can play in the future. Thank you for teaching the next generation.

**Intended Use:** This set of five lessons is generally relevant for students in grades K through 8. The lessons can be taught during the school day or as part of an extracurricular activity. The time needed for the lessons ranges from 20 minutes to two hours. The lessons are intended to be taught by someone with experience in the transportation field or a related field. Key concepts are described in an accessible manner so that anyone can use the materials. Instructors with a passion for learning new topics are also encouraged to familiarize themselves with the why and how of these concepts.

## The Why and How Behind the Concepts

- ▶ Improving the ability of all road users to see each other: It's key for the people who are not in vehicles to see and be seen so that they do not put themselves in jeopardy around moving vehicles. Being able to see properly, gives drivers enough time to stop.
- ▶ Shortening the distance for people to cross the street: Shorter distances take less time to traverse so people experience less risk. Children, older adults, and people with disabilities may take more time when crossing so this is especially important for them.

- ▶ Making crossing the street safer for people with a range of abilities: Street crossings for people walking are improved by adding features like pedestrian refuge islands, curb extensions, narrower lanes, lighting, audible signals, clearer pavement markings, and more.
- ▶ Reducing driver speed: Higher speed traffic results in more severe injuries. People outside vehicles are disproportionately injured over those protected inside the vehicle. At higher speeds, drivers require more time (and distance) to slow down and react to what's in front of them. Adding street designs that lead to even a small speed reduction can result in less severe crashes.
- ▶ Using design to increase the chance that a driver acts safely around other road users: Features that change the road landscape like pedestrian refuge islands, curb extensions, and rectangular rapid-flashing beacons can improve the visibility of a crossing to drivers. Width of travel lanes, number of lanes, traffic signal timing, and roadside design can all send subconscious cues to drivers about appropriate travel speed around other road users.
- ▶ Creating space for people to walk, bicycle, take the bus, or park their car safely: The design of streets and public space should generally be such that it limits the maximum speed at which drivers can operate comfortably while also ensuring that there is plenty of space assigned for the mobility safety needs of other road users. Trails/paths/greenways can also be used to create separate space, and often more direct routes, for people walking and bicycling.





## Doing Hands-on STEM Activities with Kids

### Planning for the Activity

- Try out all elements beforehand and make samples of anything children need to create.
- Label, sort, and measure out materials and supplies so they can be set up quickly.
- Prepare a brief script or set of prompts printed out in large font with pages numbered.

### Working with Schools and Teachers

- Assure them that you will be taking care of upfront planning and supply preparation.
- Ask whether the teacher will be remaining with the students during your lesson.

### Introducing the Activity

- Introduce yourself with a friendly story.
- Plan and practice your favorite age-appropriate icebreaker for when you first meet the students.
- Let children know at the start what to expect over the course of the session.
- Be positive about the activity and how they will perform.

### Working with Children

- Encourage manipulation of materials and whole-body movement to enhance learning.
- Avoid assumptions about children's background, family situation, and where they live (i.e., not every student has a house, car, mom/dad, etc.).
- Be mindful of the fact that students may have been involved in a traffic crash or have someone important in their life who has experienced traffic violence.
- Have an extra related activity on-hand for a child who may be unable to participate.

### Conducting the Activity

- Repeat and explain what you are doing as you go.
- Include fun stories and friendly explainers.
- Be prepared to add or shorten time assigned to steps based on engagement levels.
- Assign roles or tasks to children who may be left out or less engaged.

### Watch Your Language

- Use every day English terms. Avoid jargon and overly technical details.
- When you do need to include unfamiliar terms, explain in a straightforward way.

### Framing the Activity

- Explain technical ideas through people's everyday lives and helping them get places.
- Add characters and names to explanations about getting from A to B.
- Use the opportunity to bust stereotypes about mobility and safety.

### Encouraging Future Careers & Roles

- Explain the fun parts of these jobs and how the work helps people in real life.
- Tell children directly that they too could aspire to play roles in this field in the future.
- Let them know we need people like them as our future engineers, planners, computer scientists, data analysts, researchers, equipment manufacturers, and street contractors.





## Street Elements – Glossary of Terms

These terms are used throughout the lessons to describe different parts of a street. You and your students will need to use these terms as you explore the design of streets and how they can be made safer and more comfortable for people walking along and across the street. Please refer to the descriptions below to ensure that you and your students are working from a common definition.

The following page shows a street scene labeled with most of these terms.

### **Bike lane**

a portion of the street with stripes and symbols indicating separate space for bicyclists to travel. A bike lane can be placed against the curb of the sidewalk or against a vehicle parking lane.

### **Crosswalk**

indicates the preferred location for people to walk across the street. Crosswalks also warn drivers to look for people crossing. Crosswalks can be installed at intersections and across the middle of a street between intersections (i.e., midblock). Crosswalks can be marked a few different ways from curb ramp to curb ramp—they can be two parallel line or have a style that looks like piano keys or a ladder. Not all legal crosswalks are marked with paint, but for the purposes of these STEM lessons, we will always be talking about marked crosswalks.

### **Curb extension**

(not shown on pg. 4) extends the sidewalk or curb line out into the parking lane to reduce the street width and shorten the crossing distance for pedestrians. Curb extensions can be used at intersections or at a crosswalk in the middle of the street. They should not block bike lanes.

### **Curb ramp**

provides easy and safe access between the sidewalk and the street for all people, especially people who are using wheelchairs, strollers, crutches, or have a difficult time stepping up or down. Curb ramps include a bumpy area (often yellow) that alerts people who have vision impairments to the sidewalk and street edge.

### **Median**

the area that separates opposing vehicle travel lanes. These can be marked using paint or be raised with curbs and landscaping (as shown). Not all streets have medians.

### **Pedestrian refuge island**

can be used on its own, or as part of a median, to protect pedestrians while crossing streets with multiple vehicle travel lanes. These spaces allow people to cross part of the street and safely wait for an opportunity to cross the rest of the street. They can be used at intersections or at crosswalks in the middle of the road.

### **Sidewalk**

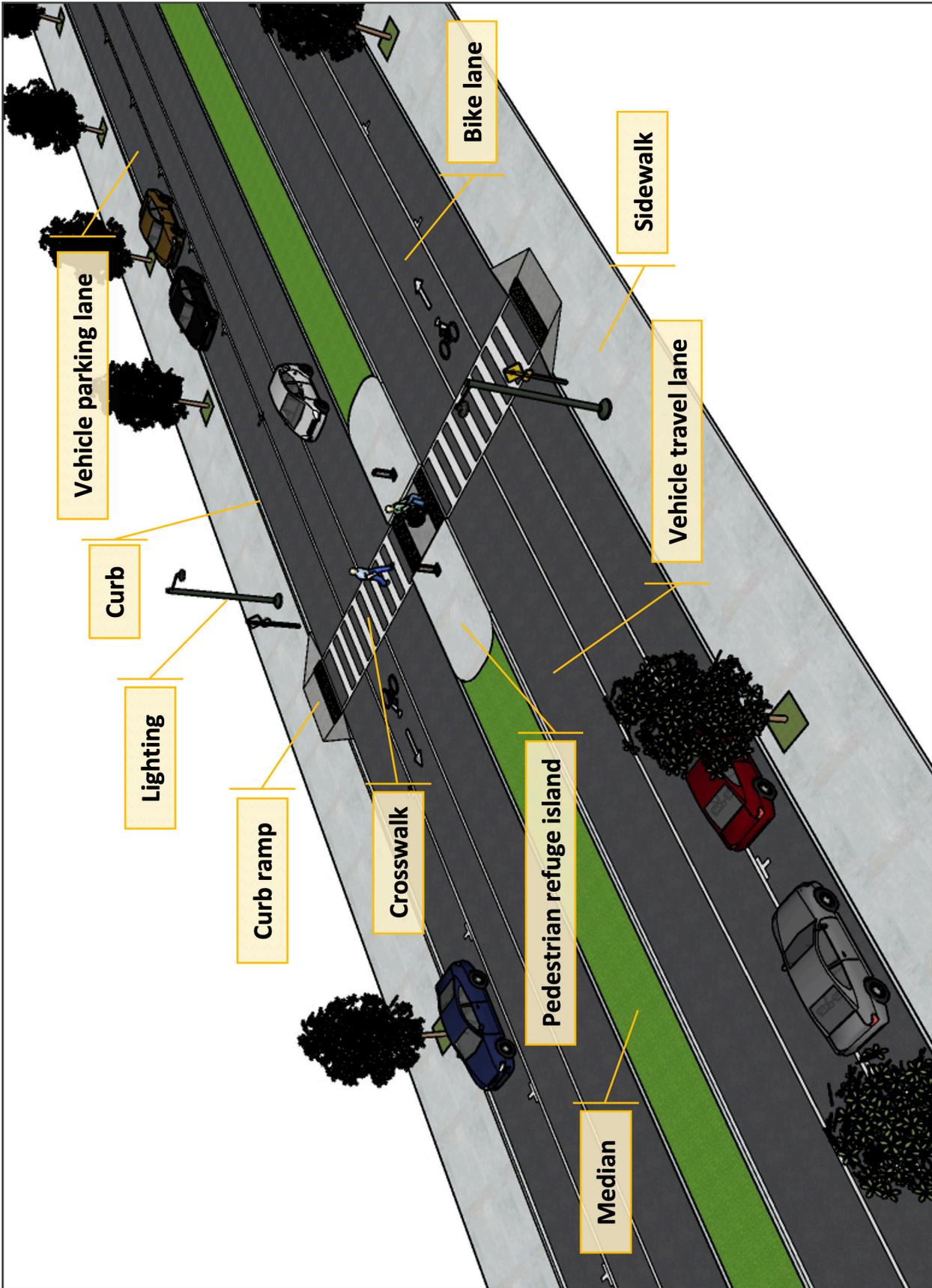
space for people to travel that is separate from cars. Sidewalks also provide places for children to walk, run, skate, ride bikes, and play.

### **Vehicle parking lane**

space in the street for drivers to store their cars when they have arrived at their destination. The vehicle parking lane is sometimes referred to as on-street parking. Not all streets have, or need, vehicle parking lanes.

### **Vehicle travel lane**

a portion of the street that is marked for a single line of vehicles to travel (i.e., cars, buses, trucks). They can also be used by bicyclists. Travel lanes are separated by yellow or white paint that runs in dashes or solid lines depending on whether vehicles are allowed to change lanes. Streets range from one, one-way travel lane to multiple lanes traveling in each direction. Generally, more travel lanes and wider travel lanes are less safe for pedestrians.



# STREET ELEMENTS