

**EDUCATOR GUIDE**

# Toyota RISK-ATTEND Self-Paced Module

## KEY LEARNING OBJECTIVES

- Novice drivers will perceive and predict potential risks such as vegetation, large vehicles, pedestrians, geometry of the road, and stopped vehicles in various driving scenarios.
- Novice drivers will communicate appropriate actions when potential risks are identified.
- Novice drivers will understand the benefits of proactive driving to maintain the safety of themselves and others.

## BACKGROUND

Toyota Risk-ATTEND (Risk-Anticipation Training To Enhance Novice Driving) is a training program to improve drivers' abilities to predict or detect risky situations while driving. Driving requires focused attention and novice drivers should be well-versed in all potential risks before getting behind the wheel. The Toyota Risk-ATTEND training will educate novice drivers about potential risks and why it is important to perceive and predict potential risks while driving. This training program is built for research evaluation by the University of Massachusetts Amherst and Toyota Collaborative Safety Research Center. Duplication is prohibited without express approval.

The Toyota Risk-ATTEND training practices the attention needed to manage multiple tasks and stimuli. These tasks include maintaining vehicle control, observing road conditions and predicting driving responses, and identifying pedestrians and other non-vehicular traffic, as well as understanding the road needs of various vehicles based on size and weight. Novice drivers need to divide their attention among various tasks while actively looking for potential risks on the road. This is practiced through scanning the environment, checking blind spots, and anticipating the actions of other drivers, pedestrians, children, and cyclists. It should be emphasized that driving requires both divided attention and a focus on predicting potential risks.

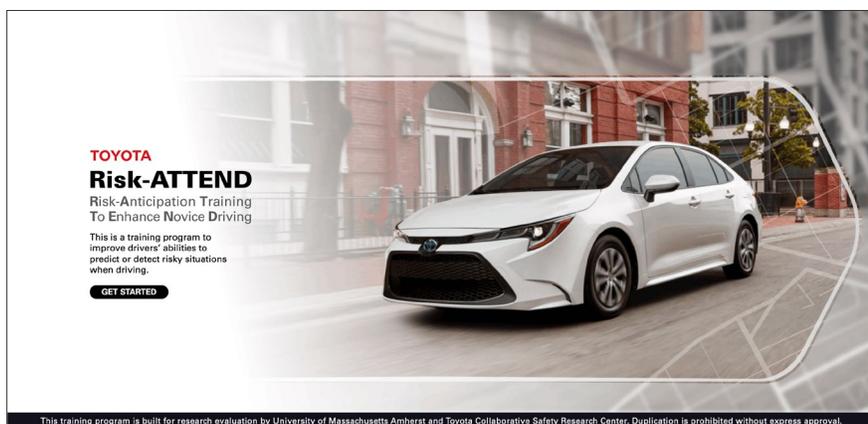
The training curriculum includes various components such as classroom instruction, the Toyota Risk-ATTEND self-paced Module, and parent guide. Novice drivers should be taught about specific locations on the road where potential risks can arise, how to identify or predict potential risks, and suitable responses to driving risk, in a spaced curriculum prior to driving age.

## OVERVIEW

Toyota Risk-Anticipation Training to Enhance Driving (Risk-ATTEND) trains novice drivers to predict or detect risky situations when driving and demonstrate driving strategies when those potential risks are

encountered. In this program, novice drivers will encounter driving situations or “scenarios” represented and will be asked to identify locations that may be an indicator of risks. The following geometry lesson is intended to be completed after students have completed the Toyota Risk-ATTEND self-paced module. Use the tips below to introduce the self-paced module to students prior to the lesson.

## SETTING THE STAGE FOR NOVICE DRIVERS



Announce to students that they will be using the Toyota Risk-Anticipation Training to Enhance Driving (Risk-ATTEND) self-paced module to perceive and predict potential risks in various scenarios. A critical piece of safe driving is acquiring the skills to proactively identify risks in the driving environment. Students may want to brainstorm examples of potential risks.

### Introduce the following vocabulary and discuss the potential risk associated with each:

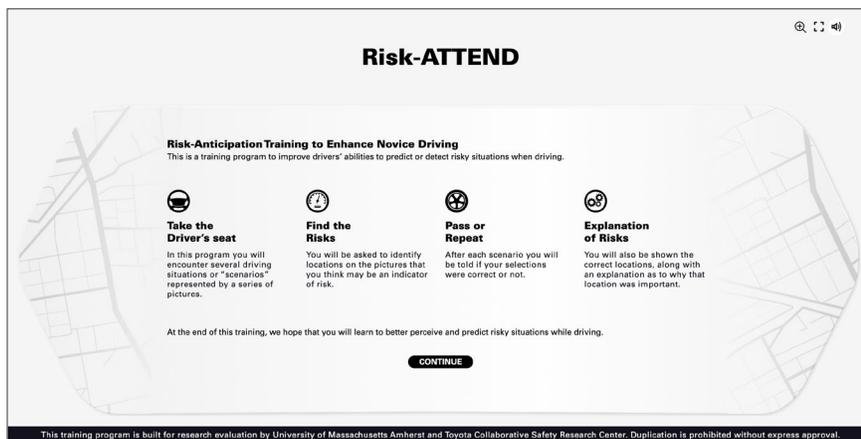
- **Vegetation:** Hazards may be hidden by vegetation. The edge of the vegetation is a primary area of interest where a hazard could appear unexpectedly. The view of oncoming traffic could be obstructed. Novice drivers should glance at the area frequently so that they can slow down or stop immediately if someone or something appears from an obstructed view.
- **Playgrounds:** Playgrounds and children playing create risk for themselves and drivers. Children may chase toys such as balls or simply not look before entering the road. Glancing towards playgrounds and slowing speed when children are present can prevent accidents.
- **Large Vehicles:** Hazards may be hidden by large vehicles that obstruct the view behind and/or beside them. Important cues such as traffic lights, pedestrians, or road signs could be hidden. Novice drivers should increase awareness of their speed as well as of vehicles in adjacent lanes. Special attention should also be paid to traffic signals.
- **Road Geometry:** The shape or geometry of a road alone may be a risk to novice drivers. Paying attention to road signs warning of curves could be helpful in avoiding vehicles moving into adjacent lanes. Hills can also create hazards by obstructing the view of oncoming traffic. Novice drivers should adjust speed and road position in these situations.
- **Pedestrians:** Novice drivers should always be cautious of pedestrians and cyclists but pay special attention at crosswalks where both can cross in front of the vehicle. Slow down and be alert to other vehicles stopping to give pedestrians right of way to cross. Stop signs are usually warnings for crosswalks but are not always present.
- **Stopped/Parked Vehicles:** Stopped vehicles can indicate a variety of risks. If a stopped vehicle has a blinker on, it could be pulling into traffic. Slow down and give it room. Stopped vehicles could also pose

a pedestrian risk if a passenger is exiting the vehicle. Slow down and look for open doors. Additionally, stopped vehicles can obstruct the view of pedestrians. Drivers should pay close attention and slow down when approaching stopped or parked vehicles.

**Explain to students that at the end of this training, novice drivers like them will learn to better perceive and predict risky situations while driving.**

## EDUCATOR TIPS

### Toyota Risk-ATTEND Self-Paced Module:

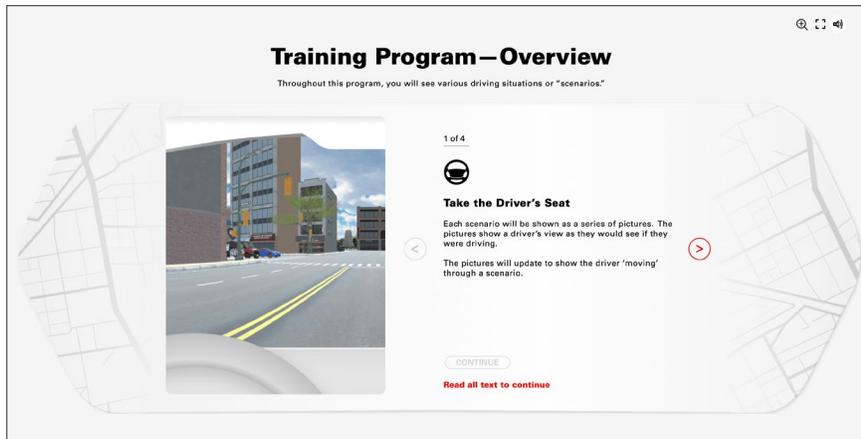


Let students know that they will complete the Toyota Risk-ATTEND Self-Paced Module by themselves. Explain that throughout the training program, they will take on the role of a driver. As a driver, they will see various driving situations or “scenarios” presented as a series of pictures as if they were driving. From the driver’s seat, they will select locations in the pictures where attention should be focused

to predict a risky situation. There may be up to 10 potential risks. Explain that if they correctly select the locations of risk, a new scenario will be presented to them. If the correct locations are not identified, the scenario can be repeated up to three times. At the end of each scenario, a “Solution Screen” will reveal areas of risk by presenting red arrows. There will be two red arrows, one indicating a primary area of risk and another for secondary areas of interest.

**Be sure students have audio turned on to hear Risk-ATTEND narration.**

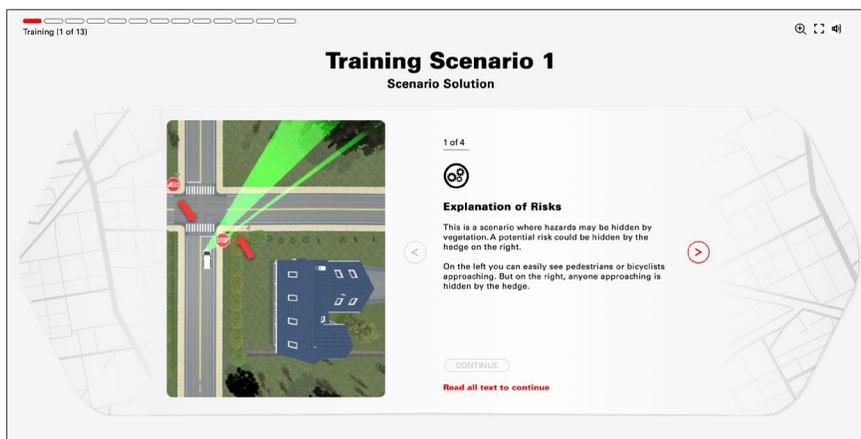
## TRAINING PROGRAM OVERVIEW



A brief overview for students is provided. Students must scroll through the directions before clicking Start. Click the right arrow to drive down the road and notice the pictures progress automatically approximately every five seconds.



As the pictures change, identify the potential risks where you (the driver) should focus attention to detect or predict a risky situation. At the end of the scenario, students will be told if their answers were correct and why each answer is correct. Based on the answers, scenarios can be repeated.

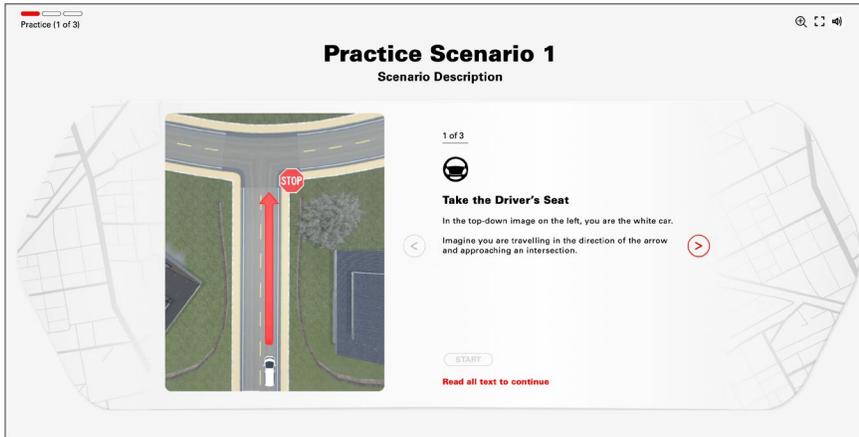


With each practice scenario, ask the following:

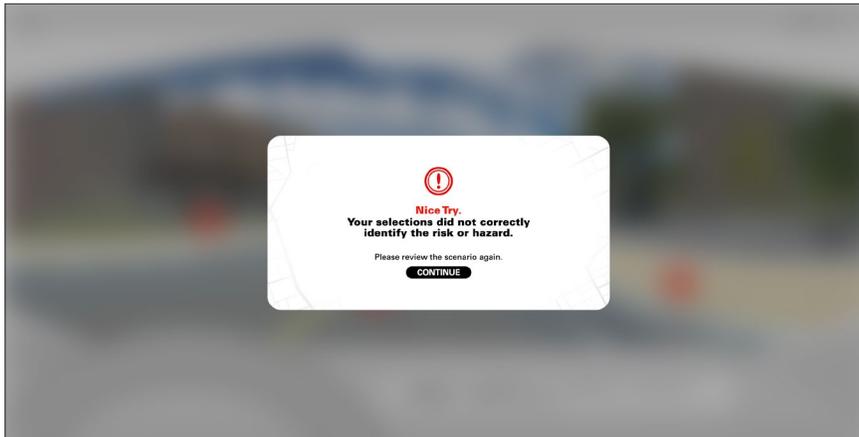
- What are the primary areas of interest?
- What are some secondary areas of interest?
- Where should you focus attention to identify potential risk?
- What should the driver do when they perceive a potential risk?

**Discussion:** Although answers may vary here, be sure to identify the large truck as an obstruction of vision, the blind curve as road geometry, and the sidewalk as a place for pedestrians. Point out that glancing toward these risks is critical for novice drivers. Direct students' attention to the red arrows to discuss primary and secondary areas of risk.

**Practice Scenario 1**



The driver's perspective is represented by the white vehicle. The red arrow indicates the direction the white vehicle is traveling. As students scroll through each screen, the perspectives will update to the perspective from the driver's seat. Each picture will be visible for about 5 seconds and students should click on each picture where they detect potential risks.



As the pictures change, identify the potential risks by clicking on the picture. A red dot will appear with each click. At the end of the scenario, students will be told if their answers were correct. If the selections are not correctly identified, a prompt will be given to repeat the scenario. Based on the answers, up to three attempts can be completed before a solution screen is presented.

**Cone of Vision** is a key term throughout the Toyota Risk-ATTEND training. Help novice drivers understand that they should glance left and right to expand their cone of vision to predict potential hazards. The cone of vision is identified throughout the scenario explanations by a green overlay indicating what a driver can see from their vantage point.



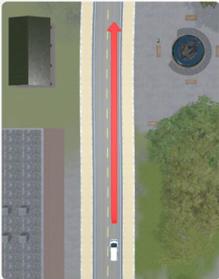
**Discussion:** Answers may vary. Some examples of potential risks are the traffic light ahead that could change signals, the intersections as road geometry, the car parked at the corner on the left intersection, and the sidewalk as a place for pedestrians. Point out that glancing towards these risks is critical for novice drivers.

## Repeat with Practice Training Scenario 2

Practice (2 of 3)

### Practice Scenario 2

Scenario Description



1 of 3

**Take the Driver's Seat**

In the top-down image on the left, you are the white car. Imagine you are travelling in the direction of the arrow and approaching an intersection.

START

Read all text to continue

Novice drivers will then either complete an additional practice scenario or move onto the actual training program.

00:03



Select the locations or items that you think are important to pay attention to in order to detect or predict risks or hazards.

Practice (2 of 3)

### Practice Scenario 2

Scenario Solution



1 of 3

**Explanation of Risks**

This screen contains information about the scenario that you have just completed.

This screen will explain to you the risks in the driving situation using images (like the image to the left) as well as text.

CONTINUE

Read all text to continue

## Begin Student Training Sessions: Remind students to turn on the audio.

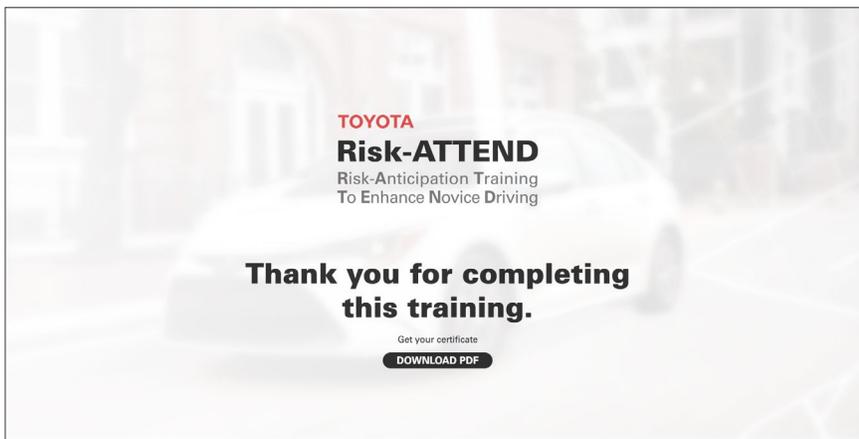
Novice drivers should be ready to take to the virtual road moving forward. Remind drivers that there could be as many as 10 potential risks identified in each scenario and encourage them to expand on the explanations at the end. Each scenario ends with tips on where to look, what to do if a potential risk is identified, and other areas of risk to consider. Red arrows will indicate primary and secondary areas of risks that should be reviewed by the student.

Students should proceed to additional Practice Scenarios to complete the Risk-ATTEND self-paced module.

Check for understanding: As novice drivers move through each training, continue to ask the following questions:

- What are the primary areas of interest?
- What are some secondary areas of interest?
- Where should you focus attention to identify potential risk?
- What should the driver do when they perceive a potential risk?

**Remind drivers to download the certificate of completion of the Toyota Risk-ATTEND self-paced module.**



# Toyota Risk-ATTEND Supplemental Geometry Lesson Guide

## LESSON OBJECTIVE

Students will make real-world connections to predict and identify potential driving risks through mathematical analysis of angles and scale measurements.

1. Identify different road geometries and their driving risks.
2. Analyze how road geometries affect driving safety.
3. Evaluate predictive driving strategies for different road geometries.
4. Apply road geometry principles to real-world driving scenarios.

## GRADE RANGE

9–12

## DURATION

45–60 instruction minutes

## LESSON OVERVIEW

Active assessment of road geometry is a tool that can be utilized to predict and identify potential risks for novice drivers. Although exact measurements are not often utilized for experienced drivers, practical connections with exact road geometry will increase awareness and embedded knowledge for novice drivers. This lesson should be used in conjunction with the Toyota Risk-ATTEND self-paced module. Students should complete the accompanying self-paced module from the driver's seat to practice identifying risky situations while driving.

## ESSENTIAL QUESTIONS FOR STUDENTS

1. How can the measure of the cone of vision impact identifying potential risks for novice drivers?
2. To what extent does a measurement of the potential risk of vegetation impact novice drivers?

## NATIONAL CONTENT STANDARDS

Common Core State Standards for Mathematics

HSG-CO (High School Geometry—Congruence)

- D. Make geometric constructions: 12. (HSG-CO.D.12) Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).

HSG-GMD (High School Geometry—Geometric Measurement and Dimensions)

- B. Visualize relationships between two-dimensional and three-dimensional objects.
- 4. (HSG-GMD.B.4) Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

#### HSG-MG (High School Geometry—Modeling Geometry)

- A. Apply geometric concepts in modeling situations.
- 1. (HSG-MG.A.3) Use geometric shapes, their measures, and their properties to describe objects.
- 3. (HSG-MG.A.3) Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

## MATERIALS

- Chart paper or digital slide for Types of Road Geometry anchor chart
- Activity Card 1, 1 per student pair
- Activity Card 2, 1 per student pair
- Student Handout, 1 per student
- Protractor, 1 per student
- Scratch paper for estimating measurement of vehicle

## LESSON

Introduce Road Geometry:

1. Road geometry refers to the shape and design of roads due to design such as intersections and/or the natural environment such as vegetation or slope.
2. Road designs create the potential for driving risks, especially for novice drivers.

Types of Road Geometry: (Create a slide or anchor chart for reference.)

- Straight roads which present the least potential risks to novice drivers.
- Curvy roads present potential risks such as blind curves and other vehicles crossing the center line.
- Hilly roads affect visibility due to changes in elevation.
- Intersections, or where vehicles cross, have a high amounts of potential risks involving other drivers, pedestrians, and factors effecting the cone of visibility for novice drives.

### Introduce Student Activity:

1. Provide students with the Activity Card 1 and Student Handout. Allow students time to complete the Student Handout. Once complete, bring the group together. Review their answers and discuss the potential risks in an intersection and the benefits for expanding the cone of vision.
2. Provide students with Activity Card 2. After they complete the questions, discuss the questions for Activity Card 2.

**Closure Discussion:**

1. How has your understanding of road geometries and driving risk changed after this lesson?
2. How can you apply the principles of road geometry to real-world driving situations?

**Extend Questions:**

1. Consider road geometry in other settings. What are some driving strategies you would use on a curved road versus a straight road?
2. Can you explain why a roundabout is safer than a traditional intersection?
3. What are some potential driving risks on a steep hill or mountain road?

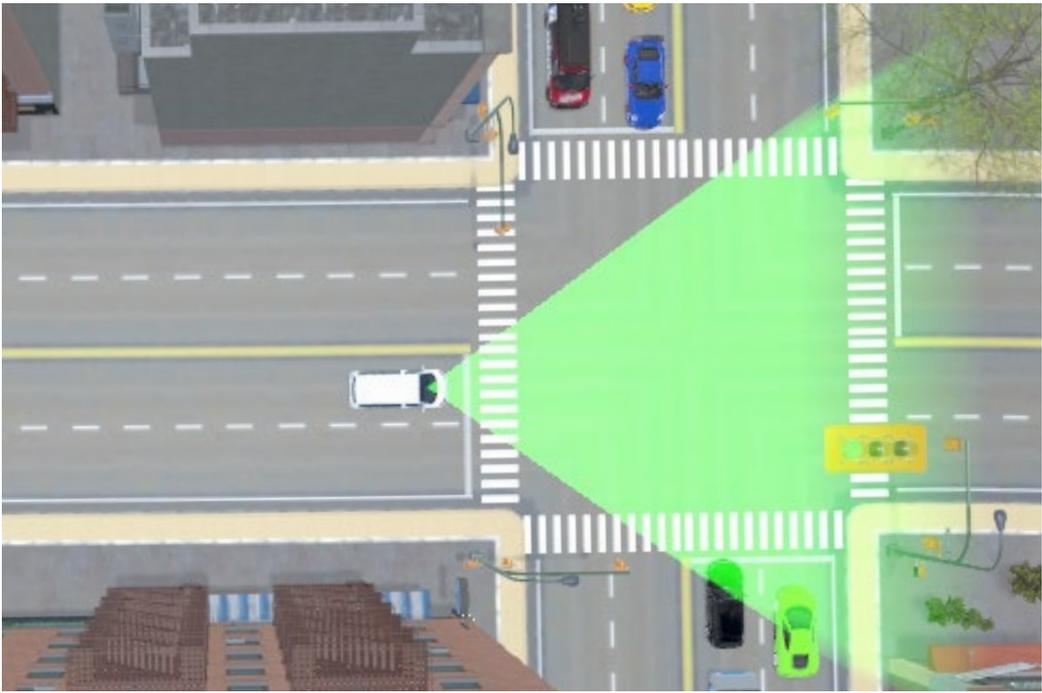
**Extension Activity (Optional):**

Student-created gallery walk: Working in pairs, ask students to create a drawing showing at least four examples of potential risks. Be sure to have students create an answer key that can be used to check other students work. Students should feel free to include any of the potential risks for novice drivers discussed in the Toyota Risk-ATTEND self-paced module:

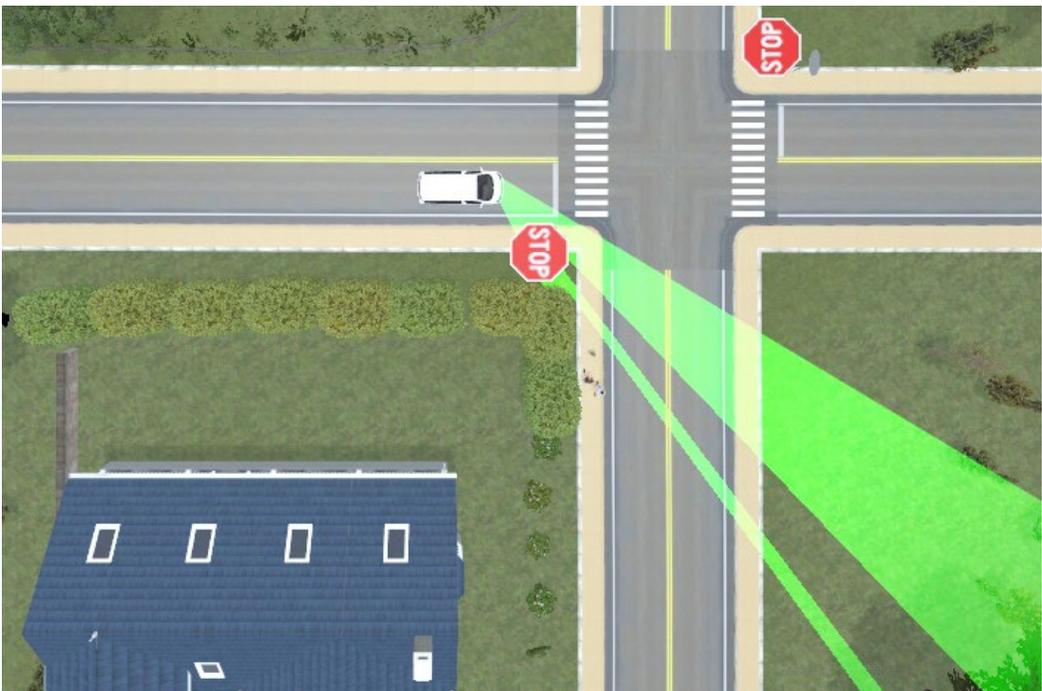
- vegetation
- intersections
- pedestrians
- large vehicles
- parked vehicles
- crosswalks

Post student drawings around the room and have other groups identify the potential risks and share effective ways to reduce accidents due to the potential risks. This could be done together, using sticky notes, or as a competition to see who can correctly identify the most risks.

# EDUCATOR REFERENCE CARDS



Educator Reference  
for Activity Card 2



Educator Reference  
for Activity Card 2

The Toyota Risk-ATTEND program is a training program to improve drivers' abilities to predict or detect risky situations when driving. Students should complete the accompanying self-paced module from the driver's seat to practice identifying risky situations while driving.

**ACTIVITY CARD 1**

Notice the field of direct vision for the white vehicle. Everything outside of the grey cone of vision can be potential risks that a novice driver does not directly see.

1. What is the measure of the angle from the driver's perspective?
2. What potential risks are outside the cone of vision?

A novice driver should actively glance to both sides to observe potential risks.

3. If the driver turns their head 75 degrees from the center, the cone of vision will briefly change. Draw the rotated cone of vision in red.
4. If the driver turns their head 60 degrees from the center to the right, the cone of vision increases. Draw the rotated cone of vision red.
5. Determine the total vision field including the original cone of vision by glancing left 75° and right 60°. Hint: Do not add the three measurements for the add. There is overlap.
6. For a novice driver, mathematically explain the benefit for increasing the cone of vision.

**ACTIVITY CARD 2**

The vegetation to the right of this street presents a potential risk for the novice driver in the white car at the intersection. The lighter angle represents the cone of vision for the novice driver when glancing right.

7. If drawn to scale, the white vehicle represents 12 feet; estimate the distance from the intersection to the point a novice driver will first see a vehicle hidden by the vegetation.
8. Explain the potential risk for the novice driver. What defensive driving skills should the driver perform?

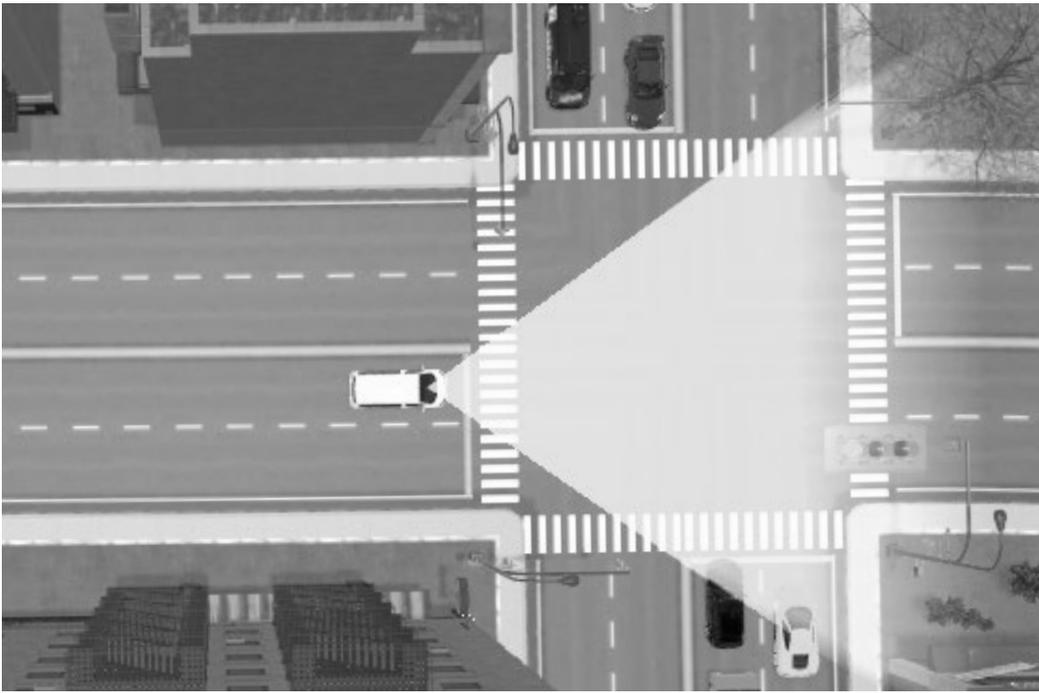
The homeowner recognizes the potential risks of their vegetation and chooses to cut the row of bushes starting at the dark line.

9. Redraw the cone of vision for the novice driver and shade the cone red.
10. Estimate the new distance from the intersection to the point the novice driver will first see a vehicle hidden by the vegetation.

Discuss the impact on potential risks for the novice driver when the vegetation is trimmed.

# EDUCATOR REFERENCE CARDS

Educator Reference  
for Activity Card 1



Educator Reference  
for Activity Card 2

