

# Aashto Roadside Design Guide For Barriers

## CHAPTER 4 BARRIER DESIGN AND PLACEMENT

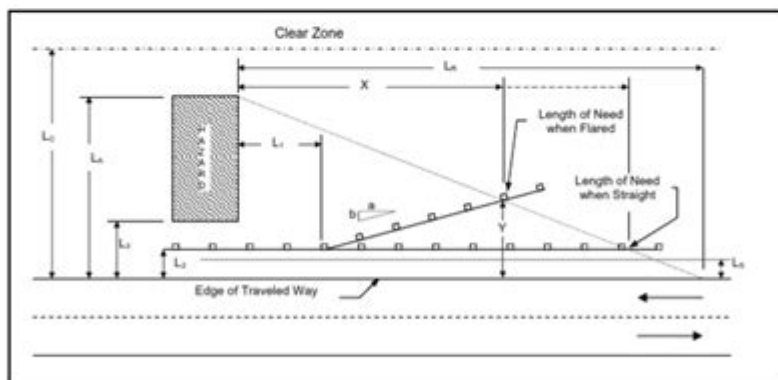
### 4.1 OVERVIEW OF THE AASHTO ROADSIDE DESIGN GUIDE DESIGN PROCESS

Chapter 5 of the AASHTO *Roadside Design Guide (RDG)* contains roadside barrier layout and design guidance. It is important to understand the philosophy behind the design process presented in the *RDG*. If a vehicle leaves the roadway at approximately 10 degrees in the vicinity of the upstream end of a roadside barrier and the driver then attempts to correct and return to the pavement, the vehicle could be traveling parallel and behind the barrier. This design process is intended to allow sufficient room for a vehicle to come to a stop before striking the hazard if it should get into this situation. An important part of the layout process is to allow a clear zone behind the barrier upstream of the hazard. This is also an important concept to remember in the construction and maintenance of the roadway.

#### 4.1.1 Design Variables

Figure 4.1 shows the variables that are considered in the *RDG* design process.

Figure 4.1: Barrier Design Variables



The variables used in the design process are defined below:

**AASHTO Roadside Design Guide for Barriers** is a comprehensive document that provides guidelines for the design of roadside barriers. These barriers are essential for ensuring the safety of vehicles and pedestrians along roadways. The American Association of State Highway and Transportation Officials (AASHTO) developed this guide to assist engineers, planners, and designers in creating safe and effective roadside environments. This article delves into the key aspects of the AASHTO Roadside Design Guide, focusing on the principles, types of barriers, and the design considerations that are crucial for roadway safety.

## Understanding the Importance of Roadside Barriers

Roadside barriers play a critical role in protecting vehicles from hazards such as steep

embankments, roadside obstacles, and opposing traffic. They are designed to redirect or contain vehicles that may inadvertently leave the travel lane. The importance of these barriers cannot be overstated, as they can significantly reduce the severity of crashes and save lives.

## Functions of Roadside Barriers

The primary functions of roadside barriers include:

1. **Crash Mitigation:** Barriers are engineered to absorb energy during vehicle impacts, reducing the likelihood of serious injuries.
2. **Deflection Control:** Properly designed barriers help manage the deflection of vehicles upon impact, ensuring they do not veer into dangerous areas.
3. **Containment:** Barriers are used to contain vehicles within the roadway, preventing them from crossing into oncoming traffic or off the road entirely.
4. **Redirection:** Some barriers are designed to redirect vehicles back onto the roadway, minimizing the chance of further accidents.

## Types of Roadside Barriers

The AASHTO Roadside Design Guide categorizes barriers into several types, each suited for different applications and environments.

### 1. Concrete Barriers

Concrete barriers are typically used in urban areas or high-speed environments. They are effective at redirecting vehicles but can be harsh on impacts if not designed with sufficient energy absorption features. Key types include:

- **New Jersey Barrier:** A common type of concrete barrier known for its effectiveness in redirecting vehicles.
- **Vertical Wall Barrier:** Often used in median applications, these barriers can redirect vehicles but may lead to severe impacts.

### 2. Steel Barriers

Steel barriers, including cable and beam guardrails, are widely used due to their versatility and effectiveness. They provide a softer impact compared to concrete barriers. Types include:

- **W-Beam Guardrail:** A widely used steel barrier that can absorb impacts effectively while minimizing vehicle damage.

- Cable Barrier: Comprising several cables strung between posts, these barriers are effective at containing vehicles and reducing deflection.

### **3. Flexible Barriers**

Flexible barriers are designed to deform upon impact, absorbing energy and reducing the severity of crashes. They are particularly useful in areas where space is limited. Examples include:

- Plastic or Polymer Barriers: Lightweight and portable, these barriers are used in temporary applications and can be easily relocated.
- Sand-filled Barriers: Often used in construction zones, these barriers can be filled with sand or water to increase their mass and effectiveness.

## **Design Considerations for Roadside Barriers**

When designing roadside barriers, several considerations must be taken into account to ensure they meet safety standards and perform effectively.

### **1. Site Assessment**

Before selecting and designing a barrier, a thorough site assessment is essential. Factors to consider include:

- Roadway Type: The type of roadway (urban, rural, highway) will influence the barrier design.
- Traffic Volume and Speed: Higher traffic volumes and speeds necessitate more robust barrier designs.
- Surrounding Environment: The presence of pedestrians, adjacent land uses, and potential hazards (such as trees or utility poles) must be evaluated.

### **2. Barrier Height and Width**

The height and width of barriers are critical for ensuring their effectiveness. The AASHTO guidelines provide specifications for:

- Height: Barriers must be tall enough to prevent vehicles from rolling over or crossing over them.
- Width: Sufficient width is necessary to accommodate vehicle deflection during an impact.

### **3. Impact Performance**

The AASHTO Roadside Design Guide outlines performance criteria for barriers based on crash testing. Barriers must be tested against various vehicle types and speeds to ascertain their

effectiveness. Key performance measures include:

- Redirecting Ability: The barrier's capacity to redirect vehicles back onto the roadway.
- Containment: The ability to prevent vehicles from crossing into opposing traffic or off the road.

## **4. Maintenance and Durability**

Barriers must be designed for durability and ease of maintenance. Considerations include:

- Material Selection: Selecting materials that withstand environmental conditions and require minimal maintenance.
- Inspection Protocols: Establishing regular inspection schedules to ensure barriers remain effective and free of damage.

## **Implementing AASHTO Guidelines in Practice**

To effectively implement the AASHTO Roadside Design Guide for barriers, transportation agencies and highway designers should follow a systematic approach:

### **1. Training and Education**

Ensuring that engineers and designers are well-trained in the AASHTO guidelines is crucial. This can be achieved through workshops, seminars, and continued professional education.

### **2. Collaboration with Stakeholders**

Collaboration between various stakeholders, including transportation agencies, local governments, and the community, helps in understanding specific needs and constraints related to roadside barrier design.

### **3. Continuous Research and Development**

Investing in research to improve barrier design and performance is essential. This includes studying new materials, design techniques, and crash testing methodologies to enhance roadside safety continually.

## **Conclusion**

The AASHTO Roadside Design Guide for barriers serves as an essential resource for ensuring

roadside safety and minimizing the consequences of vehicle impacts. By understanding the importance of barriers, selecting the appropriate type, and adhering to the design considerations outlined in the guide, transportation professionals can significantly contribute to safer roadways. Continued training, collaboration, and research will ensure that roadside barriers evolve to meet the challenges of modern transportation systems, ultimately protecting lives and enhancing road safety.

## **Frequently Asked Questions**

### **What is the purpose of the AASHTO Roadside Design Guide for barriers?**

The AASHTO Roadside Design Guide provides guidelines for the design and placement of roadside barriers to enhance safety by minimizing the risk of vehicle collisions with fixed objects and reducing the severity of crashes.

### **What types of barriers are covered in the AASHTO Roadside Design Guide?**

The guide covers various types of barriers including concrete barriers, metal beam guardrails, cable barriers, and crash cushions, each tailored for different roadside conditions and vehicle types.

### **How does the AASHTO guide address barrier performance during crashes?**

The AASHTO guide includes performance criteria based on crash testing and evaluation, offering specifications on impact resistance, deflection, and the ability to redirect vehicles safely upon impact.

### **Are there specific recommendations for barrier placement in the AASHTO Roadside Design Guide?**

Yes, the guide provides detailed recommendations for barrier placement, including distances from the roadway edge, consideration of roadside slopes, and the need for clear zones to improve safety.

### **What updates have been made to the AASHTO Roadside Design Guide in recent editions?**

Recent editions of the AASHTO Roadside Design Guide have included updated crash data, improved design methodologies, and enhanced guidance on the integration of new materials and technologies for barrier systems.

### **How does the AASHTO Roadside Design Guide impact highway safety policy?**

The AASHTO Roadside Design Guide influences highway safety policy by providing standardized criteria for barrier design and installation, which helps state and local agencies create safer roadways and reduce accident rates.

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## **Aashto Roadside Design Guide For Barriers**

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Feb 4, 2025 · Mayorkas settlement in January 2023. This settlement restored the practice of processing H-4 and EAD applications alongside H-1B petitions when filed together, addressing the significant delays that arose under previous policies introduced by ...

#### *H4 EAD with H1,H4 extension. What should be the receipt number*

Jan 15, 2019 · My employer is going to file H1B (and my spouse's H4) extension. I am planning to file my wife's EAD extension together with the H1B,H4 extension. If yes, do I need to write the latest approved I797 receipt number in Question 29? Yes, you can apply all 3 together. Leave it blank as you are filing H1B extension along with H4 EAD application.

#### H4 & H4 EAD premium processing to end on 18 Jan 2025

Jan 13, 2025 · USCIS has decided to not continue the H4 & EAD processing within the H1B 15-day premium processing time. Delays are expected but EAD auto extension can help.

### **H1B, H4 and H4 EAD Concurrent Filing, Premium Processing and ...**

May 28, 2025 · This means that H4 visa holders can now apply for both their H4 visa and H4 EAD at the same time as the primary H1B petition. This change significantly reduced H4 EAD processing time to less than a month, allowing H-4 visa ...

#### *We are concurrently filling H1B, H4, and H4EAD and do not have H1B ...*

Jan 4, 2025 · Generally, if the H1B holder is counted in the H1B cap lottery and the H1B petition is a first time filing that question may be left blank. Otherwise, it is the prior receipt number.

#### H4 Processing Time With H1B Premium: What to Expect

Jan 27, 2025 · Explore the H4 processing timeline when filed with H1B premium, including key steps, influencing factors, and how to track your petition status.

#### *USCIS To Bundle Adjudication of H-4 Visa Applications, H-4 EAD ...*

Jan 25, 2023 · It is likely that it will result in slower processing times for H-1B adjudications, whether or not they are filed concurrently with H-4 and EAD applications. However, the availability of Premium Processing for these cases at least provides an option to expedite processing.

#### USCIS Processing Update: H-4 / H-4 EAD - Puyang & Wu, LLC

Apr 26, 2021 · Both H-4 and H-4 EAD were filed at the same time. We are now seeing H-4s being approved at the same time as premium-processed H-1Bs. Previously, there was a delay of about 2 to 3 months. Adjudicating H-4s, H-4 EADs, and a premium-processed H-1B at the same time was the standard protocol before 2019.

#### **H4 - EAD on basis of H4 Extension Receipt Notice - H1B : H-4 ...**

Aug 1, 2020 · We am still waiting for the approval notice for H4 extension however, we have the H4 extension receipt notice from USCIS. Due to Covid, USCIS offices are closed and we did not get any notification from USCIS as of yet for any biometrics that are needed for H4 extension.

#### **H1B H4 and H4EAD filing concurrently in same package**

Aug 8, 2023 · I am filing H1B and H4 extension. I am adding H4EAD renewal I-765 form in the same package. Following are my questions:

Explore the AASHTO Roadside Design Guide for barriers to enhance safety and design efficiency. Learn more about best practices and implementation strategies!

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