

**A Focus Technology of the
American Association of State Highway and Transportation Officials (AASHTO)
Technology Implementation Group (TIG)**

CABLE MEDIAN BARRIER





Why Median Barriers ...

23,139 Road Departure Fatalities

16,214 From Run-Off-The Road (ROR) Crashes

740,000 Road Departure Injury Crashes

2,600,000 Road Departure Crashes

**267 Fatalities Involving Crossover Median Head-On
Collisions**

Source: Federal Highway Administration, "Median Barriers" (2001)



Cable Barrier ...

Safe

Effective

Cost Efficient

Proven Results

Replaceable



Share & Sponsor Technology Transfer

Promote Transportation Advancements

Encourage Implementation



Why Cable Median Barrier?



R E S U L T S

Median Crossover Collisions Before & After Cable Barrier Placement

	North Carolina		Washington		Ohio		Texas	
	Before	After	Before	After	Before	After	Before	After
All Cross Median Collisions	60	23	42.4	11.2	N/A	1	N/A	N/A
Fatal Cross Median Collisions	4	2	4.4	0.4	9	0	47	1
Disabling Injury Cross Median Collisions	7	2	5.2	1.5	N/A	0	N/A	N/A

**Across Median Crashes
Avoided**

**Disabling Injuries
Reduced**

Lives Saved

**Fatal Crash Costs
Decreased**



Cable Barrier Installations

	Current	Planned
North Carolina	550 miles	50 miles
Washington	165 miles	20 miles
Ohio	121 miles	500 miles
Texas	600 miles	200 miles



Approximate mileage as of 12/31/2006

Cable Median Barrier ...



Life Saving

**Injury Reducing
Technology**

Flexible

**Customizable
Solutions**

U.S. Generic Low Tension Barrier



Safence



Brifen Safety Fence

Gibraltar Cable Barrier



Nucor Marion U.S. High Tension



Trinity Cable Safety Systems (CASS)

Type of Cable Barrier Used

	Low Tension	High Tension
North Carolina	X	X
Washington	X	X
Ohio		X
Texas		X

Barrier Installation Costs



Cable Guardrail Low Tension (1-Line)

\$84,000 per mile

High Tension Cable Barrier (Socketed Post)

\$230,000 per mile

Single Face Guardrail (2-Line)

\$265,000 per mile

Double-Faced Guardrail (Strong Post)

\$175,000 per mile

Barrier Installation Costs



Cable Median Barrier

\$130,000-300,000 per mile*

W-Beam Guardrail

\$250,000-600,000 per mile*

Precast Concrete Barrier

\$300,000-2,700,000 per mile*

*Upper end of cost range reflects costs for extensive grading



Barrier Installation Costs

Concrete Barrier	\$310,000 per mile
Earth Mounding	\$190,000 per mile
Barrier W-beam Guardrail	\$83,000 per mile
High Tension Cable	\$72,000 per mile



Barrier Installation Costs



**Cable Median Barrier
(High Tension, Socket Post)
\$45,000/mile
(Include a Three Foot Mow Strip + \$45,000)**

**Precast Concrete Barrier
\$120,000/mile**

**Precast Single Slope Concrete Barrier
\$210,000**

**Cast in Place Concrete Barrier
\$250,000**



Roadway Design: Side Slope & Placement



70' Median Width or Less

8' Offset at 60' Median Widths

500 Miles of Low Tension Barrier

Cable Height

11' 6" Designed Deflection

Pre-2006: 21" Bottom
 27" Middle
 33" Top

4' Offset from Ditch Line

2006 Forward: 20 ½" Bottom
 25 ¼" Middle
 30" Top

6:1 Slopes or Flatter

Median Barrier Drawings

Design Specifications

Roadway Design: Side Slope & Placement



Placed on 6:1 Slope or Flatter

43 Miles of Low Tension Installed

Placed Within 1' of Low Point in Median

**122 Miles of High Tension
(Predominately Socketed System)**

Or

A Minimum of 8' Offset from Low Point

**Deflection Varies Depending on Post
Spacing – Generally 9'-12' with 16' Post
Spacing**





Roadway Design: Side Slope & Placement

10' Offset from Ditch Centerline

**6:1 Depressed Median Slopes
And Wide Paved Shoulders**

50'-76' Median Widths

10' Paved Inside Shoulder

Concrete Sockets

8' Deflection (generally)



Roadway Design: Side Slope & Placement



Deflection 8' or Less

6:1 Approach Slope

12' From Travel Lane

20' Post Spacing

End Cable Barrier Behind W-Beam

Place Cable Barrier on “Convex” Side of Curves





Maintenance & Repair

	North Carolina	Washington	Ohio	Texas
Maintenance Repairs	N/A	219	171	Unknown
Average Posts Hit	N/A	6-7	5.65	10
Average Hours to Repair	N/A	2-14	48-120 <small>hours from time of accident</small>	Less Than One Hour
Average Repair Cost	N/A	\$800	\$631 <small>per location</small> \$111 <small>per post</small>	Unknown

Lessons Learned

North Carolina

- ✓ 80% Decrease in Total Across Median Crashes – 86% Decrease in Fatal Across Median Crashes

Washington

- ✓ Cable Median Barriers Reduce Frequency and Severity of Median Cross-Over Collisions
- ✓ 95% of Vehicles that Hit the Cable Median Barrier Did Not Cross the Median
- ✓ Cable Median Barrier has Fewer Injuries and Secondary Collisions than Other Barriers

Ohio

- ✓ Location of Interchanges Does Not Have Impact on Barrier Plans
- ✓ Recommend Multi-Facet Approach

Texas

- ✓ Many Hits Since Cable Barrier Installed but No Penetrations To-Date
- ✓ Initial Negative Reaction from Emergency Services has been Reversed



Resources Available



www.aashtotig.org

deseretnews.com

Deseret Morning News, Tuesday

New barriers a safer

By Zack Van Eyck

Deseret Morning News

WEST VALLEY CITY — When you

Not like concrete barriers would.

But the new cable barriers now in northbound and southbound traffic freeways have proven to be more concrete at preventing roadway into the oncoming lanes.

And that should make all motorists

Safety engineers and administrators of the Department of Transportation have been impressed by the performance of the cable I-215 near the E Center and at two

deseretnews.com

Deseret Morning News, Monday, April 12, 2004

Cable splits I-15 — to save lives

By Laura Warner

Deseret Morning News

PROVO — Utah County drivers

No, they're not turning on to seeing is causing as many as

"I've heard that those wires before they can kill someone Stapley.

"It looks like they're supposed

According to Geoffrey Dupuy, Department of Transportation added to the center median doing exactly what it is supposed



Barriers prove their worth

One death since cables installed on I-70 stretch.

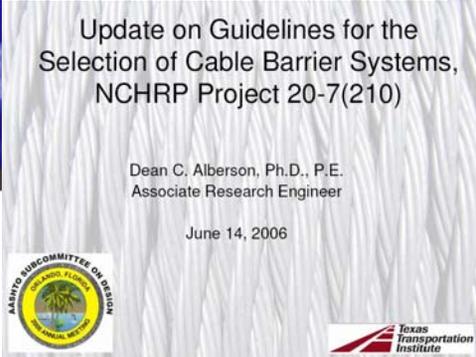


Median Barrier in North Carolina

AASHTO Subcommittee on Design - 2006 June 13-16, 2006

Ray A. Bennett, North Carolina DOT State Roadway Design Engineer

Brian Murphy, PE Traffic Safety Engineer Safety Evaluation Group



Challenges to Weigh



To Learn More



AASHTO TIG

<http://www.aashtotig.org>

Federal Highway Administration

<http://www.safety.fhwa.dot.gov>

Brifen U.S.A.

<http://www.brifenus.com>

Gibraltar

<http://gibraltartx.com>

Nucor Steel Marion

<http://nsmarion.com>

Safence

<http://www.safence.com>

Trinity

<http://www.highwayguardrail.com>

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