

Safety Effectiveness of Centerline Buffers

Srinivas Reddy Geedipally, PhD, PE
Associate Research Engineer, TTI



Why Buffers?

- Greater physical separation - shifts the lateral placement of opposing direction vehicles.
- Alleviate headlight glare.
- Project type/cost - moderate





Studies on Centerline Buffers

NCHRP 17-66 *Guidance for Selection of Appropriate Countermeasures for Opposite Direction Crashes* – **completed**

TxDOT 0-7035 *Examine Trade-Offs Between Center Separation and Shoulder Width Allotment for a Given Roadway Width* – **ongoing**



NCHRP Study

Treatment Sites

- Questionnaire sent to the TxDOT districts – feedback received from seven districts.
- Responses included centerline buffers and TWLTL – excluded TWLTL.
- Buffer width ranged from 4 to 12ft.



NCHRP Study

Treatment Sites

No of lanes	Buffer width	Mileage
Two	4	11.06
	8	0.31
	12	0.52
	ALL	11.89
Four	4	18.44
	5	0.44
	6	0.27
	8	0.55
	11	2.45
	12	8.02
	ALL	30.17



NCHRP Study

Comparison Sites

- As identical as possible to treatment sites.
- Same functional class, lanes and traffic volumes.
- Matched segment's length $>$ treatment segment's length .

No of lanes	No of segments	Mileage
Two	56	25.05
Four	351	99.73



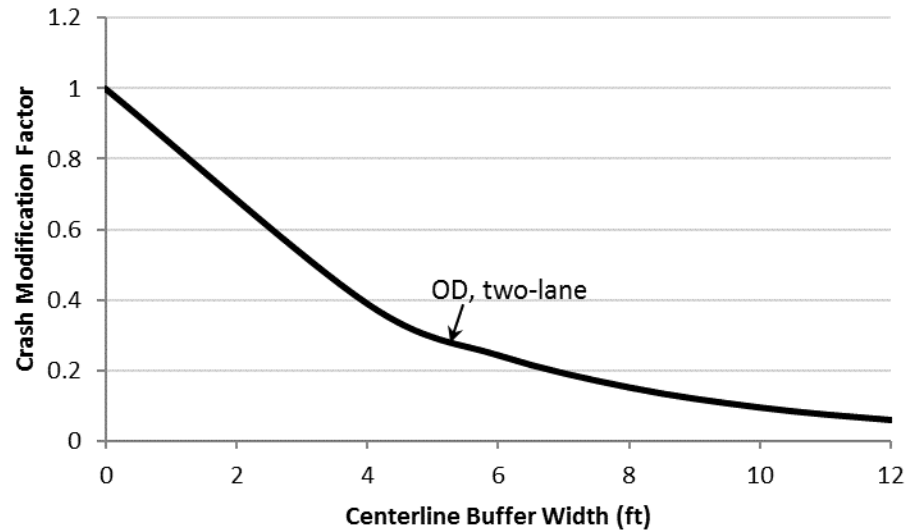
NCHRP Study

Target crashes

- opposite direction (OD) and
- single-vehicle run-off-the-road (SVROR) crashes.

NCHRP Study

OD crashes





NCHRP Study

SVROR crashes

- Not statistically significant.
- Positive effect only for two-lane highways when buffer width ≥ 8 ft.



NCHRP Study

Limitations

- Small sample size.
- Also included not “pure” centerline buffer segments.
- Shoulder width always wider for treatment sites.

No of lanes	Site type	Mean	Std. dev.
Two	Treatment	9.4	1.0
	Comparison	6.9	3.3
Four	Treatment	7.3	2.5
	Comparison	6.0	4.0



TxDOT Study

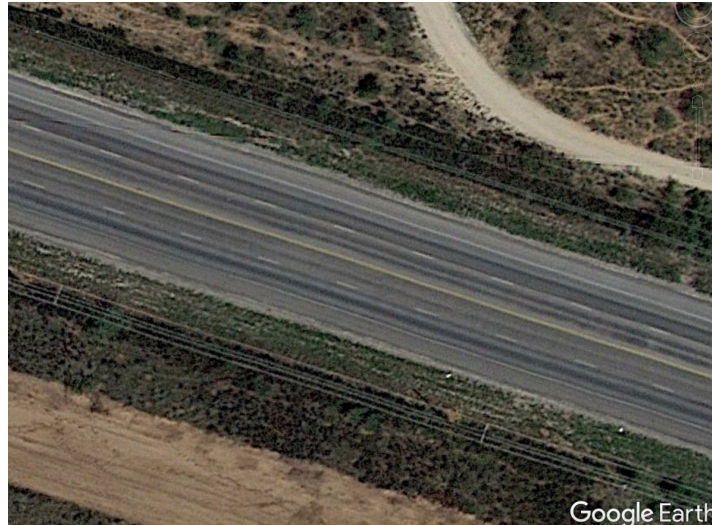
Adding median buffers on four-lane highways

Highway	Limits	Construction period
SH158	4 m SE of I20 to Glasscock CL	Sep 2017 to May 2018
SH349	Midland CL to Dawson CL	Sep 2019 to May 2020

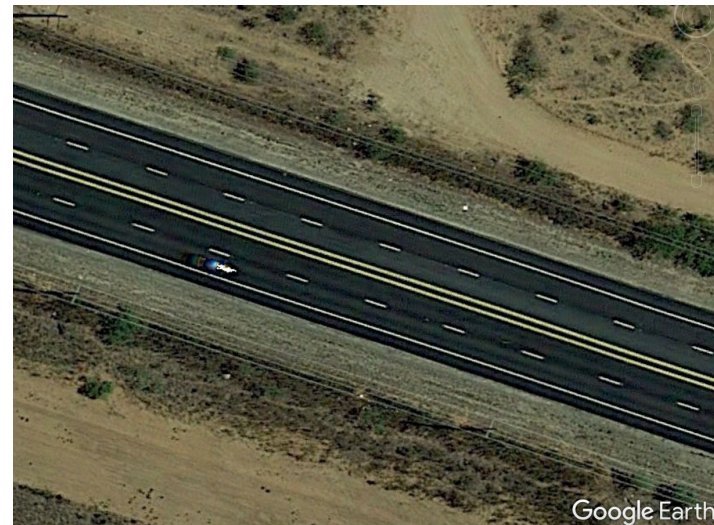


TxDOT Study

SH 158: Before-After



August 2017



June 2018



TxDOT Study

SH 158: Before-After

Highway	Crash Severity/ type	Before Crashes (36 months)	After Crashes (27 months)	Difference (crashes/ month)	Change in crashes
SH158 (12.08 mi)	All	129	62	1.29	-36%
	KA	16	11	0.04	-8%
	B	10	10	-0.09	+33%
	Opp. Dir.	13	2	0.29	-79%
	Run-off-road	65	10	1.44	-79%
	Same Dir.	21	29	-0.49	+84%
	Angle	6	12	-0.28	+167%



TxDOT Study

Sites for Safety Analysis

Cross-section type	No of segments	Mileage
4-lane Undivided	500	188.7
4-lane with Median Buffer	126	70.3
4-lane with TWLTL	597	177.2



TxDOT Study

Crash Rate Comparison

Cross-section type	All Crashes	KAB Crashes	Intersection Crashes
4-lane Undivided	1.62	0.37	0.66
4-lane with Median Buffer	0.33	0.07	0.03
4-lane with TWLTL	1.15	0.27	0.64



THANK YOU

Srinivas Reddy Geedipally, Ph.D., P.E.

Associate Research Engineer

Texas A&M Transportation Institute

Srinivas-g@tti.tamu.edu

Tel 817.462.0519 ext 11519

