



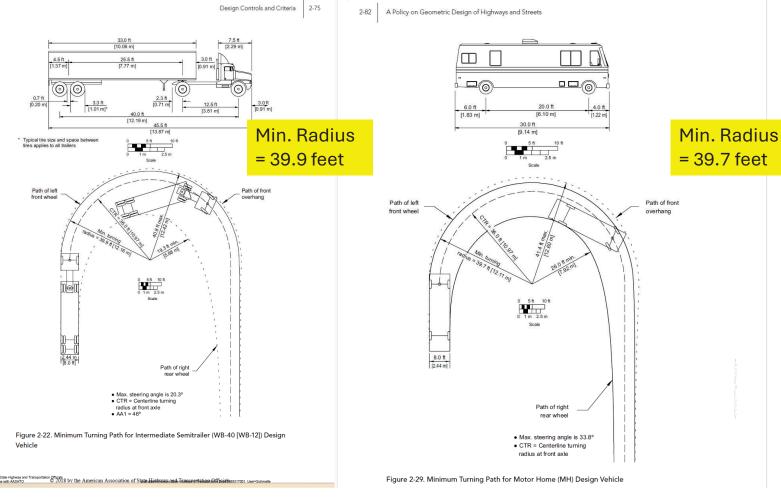




Aerial Imagery from Lake County Parcel Viewer and Google Earth showing the radius of the hairpin curve on High Valley Road is less than the 4290 minimum requirement of 50 feet.

Source: AASHTO A Policy of Geometric Design of Highways and Streets 2018 7<sup>th</sup> edition p.2-75, 2-82

Longer
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Longer **Vehicles** cannot negotiate the hairpin turn without encroaching into oncoming traffic

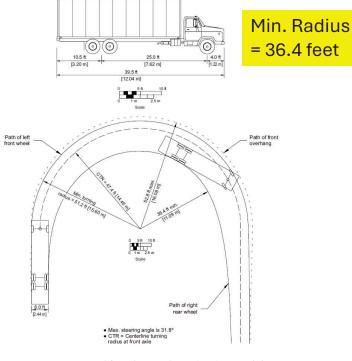


Figure 2-12. Minimum Turning Path for Single-Unit Truck (SU-40 [SU-12]) Design Vehicle

Min. Radius = 28.4 feet 6.0 ft [1.83 m] Path of left front wheel Path of front Path of right Max. steering angle is 31.8°
 CTR = Centerline turning radius at front axle

Figure 2-11. Minimum Turning Path for Single-Unit Truck (SU-30 [SU-9]) Design Vehicle

## Source: AASHTO A Policy of Geometric Design of Highways and Streets 2018 7th edition p.2-59

Table 2-5a. Minimum Turning Radii of Design Vehicles (U.S. Customary Units)

Design Vehicle	Passen-	Single- Unit	Single- Unit Truck (Three	Interci	ty Bus	City Transit	Conven- tional School Bus (65	Large <sup>2</sup> School Bus (84	Articu- lated	Interme- diate Semi-		state trailer	"Double Bottom" Combi- nation	Rocky Mtn Double	Triple Semi- trailer/ Trailers	Turnpike Double Semi- trailer/ Trailer	Motor Home	Car and Camper Trailer	Car and Boat Trailer	Motor Home and Boat Trailer
Type	ger Car	Truck SU-30	Axle) SU-40	(Motor BUS-40	Coach) BUS-45	Bus CITY-BUS	pass.) S-BUS36	pass.) S-BUS40	Bus A-BUS	trailer WB-40	WB-62*	WB-67**	WB-67D	WB-92D	WB-100T	WB- 109D*	МН	P/T	P/B	MH/B
Symbol Minimum Design Turning Radius (ft)	23.8	41.8	51.2	41.7	44.0	41.6	38.6	39.1	39.4	39.9	44.8	44.8	44.8	82.0	44.8	59.9	39.7	32.9	23.8	49.8
Center- lineb Turning Radius (CTR) (ft)	21.	38.0	47.4	37.8	40.2	37.8	34.9	35.4	35.5	36.0	41.0	41.0	40.9	78.0	40.9	55.9	36.0	30.0	21.0	46.0
Minimum Inside Radius (ft)	14	28.4	36.4	24.3	24.7	24.5	23.8	25.3	21.3	19.3	7.4	1.9	19.1	55.6	9.7	13.8	26.0	18.3	8.0	35.0

- Design vehicle with 53-ft trailer as grandfathered in with 1982 Surface Transportation Assistance Act (STAA).
- School buses are manufactured from 42-passenger to 84-passenger sizes. This corresponds to wheelbase lengths of 11.0 to 20.0 ft, respectively. For these different sizes, the minimum design turning radii vary from 28.1 to 39.1 ft and the minimum inside radii vary from 17.7 to 25.3 ft.
- The turning radius assumed by a designer when investigating possible turning paths is set at the centerline of the front axle of a vehicle. If the minimum turning path is assumed, the CTR approximately equals the minimum design turning radius minus one-half the front width of the vehicle.

Only a passenger car can safely negotiate a curve radius less than 25 feet











CalFire and USFS
Fire vechicles
responding to an
incident
approaching
Hairpin Turn on
High Valley Road.
Including a trailer
with grading
equipment.

Note: All the vehicles are driving in the opposite lane well before hairpin turn in an attempt to negotiate the turn.





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Trucks approaching sharp non-compliant curve across from school. Note all trucks are driving entirely into the opposing lane of traffic.

## Curve issues:

- 4290 and HDM non-compliant curve radius requirements
- HDM Line-of-sight visibility requirements due to tree obstructions
- HDM advisory against curves at the bottom of steep downgrades
- HDM and 4290 road width requirements





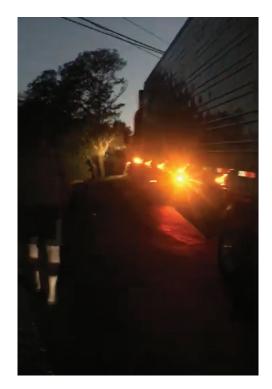
Two separate incidents of RVs and two separate incidents of semi trailers getting stuck trying to negotiate the hairpin curve. Both lanes of traffic were blocked.







Car runs into the ditch to avoiding being sideswipes by semi driving into oncoming traffic toward elementary school <a href="https://www.youtube.com/watch?v=Cs1ULpb">https://www.youtube.com/watch?v=Cs1ULpb</a> <a href="https://www.youtube.com/watch?v=Cs1ULpb">DRzM</a>



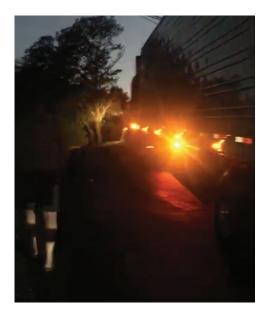
Semi stuck at hairpin curve for several minutes blocking traffic and having to drive over the edge of the road.

https://www.youtube.com/watch?v=eu2H0i5S 79A

https://www.youtube.com/watch?v=8mFqn8CeVg&t=46s



Car runs into the ditch to avoiding being sideswiped by semi driving over the centerline into oncoming traffic toward elementary school



Semi stuck at sharp curve between the school and the hairpin curve for several minutes blocking traffic and having to drive over the edge of the road.

## Source: Highway Design Manual, 7th Edition, California Department of Transportation pp200-2, 200-5, 200-8

**Table 201.1** Sight Distance Standards

Design Speed (mph)	Stopping (ft)	Passing (ft)	
10	50		
15	100		
20	125	800	
25	150	950	
30	200	1,100	
35	250	1,300	
40	300	1,500	
45	360	1,650	
50	430	1,800	
55	500	1,950	
60	580	2,100	
65	660	2,300	
70	750	2,500	
75	840	2,600	
80	930	2,700	

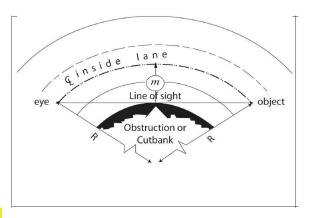
**Table 201.7 Decision Sight Distance** 

Design Speed(mph)	Decision Sight Distance(ft)
30	450
35	525
40	600
45	675
50	750
55	865
60	990
65	1,050
70	1,105
75	1,180
80	1,260

Baseline SSD at 30mph = 200 ft Baseline DSD at 30mph = 450 ft HDM advises an additional 20% on grades > 3%

Recommended SSD =240ft.; DSD = 540ft.

Figure 201.6 **Stopping Sight Distance on Horizontal Curves** 



<sup>(1)</sup>See Topic 101 for selection of design speed.

<sup>(2)</sup>For sustained downgrades, refer to underlined standard in Index 201.3

