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1240.01 General

The roadway on a curve may need to be widened to make the operating conditions comparable to those on tangents. There are two main reasons to do this. One is the offtracking of vehicles such as trucks and buses. The other is the increased difficulty drivers have in keeping their vehicles in the center of the lane.

For additional information, see the following chapters:

Chapter	Subject
1130	Roadway widths and cross slopes for modified design level
1140	Minimum lane and shoulder widths for full design level
1250	Superelevation
1360	Lane and shoulder widths for ramps

1240.02 References

(1) Design Guidance

Standard Plans for Road, Bridge, and Municipal Construction (Standard Plans), M 21-01, WSDOT

Standard Specifications for Road, Bridge, and Municipal Construction (Standard Specifications), M 41-10, WSDOT

(2) Supporting Information

A Policy on Geometric Design of Highways and Streets (Green Book), AASHTO, 2004

1240.03 Definitions

divided multilane A roadway with two or more through lanes in each direction and a median that physically or legally prohibits left turns except at designated locations.

lane A strip of roadway used for a single line of vehicles.

lane width The lateral design width for a single lane, striped as shown in the *Standard Plans* and the *Standard Specifications*.

roadway The portion of a highway, including shoulders, for vehicular use.

shoulder The portion of the roadway contiguous with the traveled way, primarily for accommodation of stopped vehicles, emergency use, lateral support of the traveled way, and use by pedestrians.

shoulder width The lateral width of the shoulder, measured from the outside edge of the outside lane to the edge of the roadway.

traveled way The portion of the roadway intended for the movement of vehicles, exclusive of shoulders and lanes for parking, turning, and storage for turning.

turning roadway A curve on an open highway, a ramp, or the connecting portion of the roadway between two intersecting legs of an intersection.

undivided multilane A roadway with two or more through lanes in each direction on which left turns are not controlled.

1240.04 Turning Roadway Widths

(1) Two-Lane Two-Way Roadways

Exhibit 1240-1a shows the traveled way width (W) for two-lane two-way roadways. For values of R between those given, interpolate W and round up to the next foot.

Minimum traveled way width W , based on the delta angle of the curve shown in Exhibit 1240-1b, may be used. Document the reasons for using the minimum width. Round W to the nearest foot.

Widths given in Exhibits 1240-1a and 1b are for facilities with 12-foot lanes. When 11-foot lanes are called for, width (W) may be reduced by 2 feet.

(2) Two-Lane One-Way Roadways

Exhibit 1240-2a shows the traveled way width (W) for two-lane one-way turning roadways, including two lane ramps and four-lane highways. For values of R between those given, interpolate W and round up to the next foot. Treat each direction of travel on four-lane facilities as a one-way roadway.

Minimum traveled way width (W), based on the delta angle of the curve (shown in Exhibit 1240-2b), may be used. Document the reasons for using the minimum width. Round W to the nearest foot.

Widths given in Exhibits 1240-2a and 2b are for facilities with 12-foot lanes. When 11-foot lanes are called for, width (W) may be reduced by 2 feet.

To keep widths to a minimum, the traveled way widths for Exhibits 1240-2a and 2b were calculated using the WB-40 design vehicle. When volumes are high for trucks larger than the WB-40 and other traffic, consider using the widths from Exhibits 1240-1a and 1b.

(3) One-Lane Roadways

Exhibit 1240-3a shows the traveled way width (W) for one-lane turning roadways, including one-lane ramps. For values of R between those given, interpolate W and round up to the next foot.

Minimum width (W), based on the delta angle of the curve for one-lane roadways, may be used. Exhibit 1240-3b gives W using the radius to the outer edge of the traveled way. Exhibit 1240-3c gives W using the radius on the inner edge of the traveled way. Document the reasons for using the minimum width. Round W to the nearest foot.

Build shoulder pavements at full depth for one-lane roadways. To keep widths to a minimum, traveled way widths were calculated using the WB-40 design vehicle, which may force larger vehicles to encroach on the shoulders. This also helps to maintain the integrity of the roadway structure during partial roadway closures.

(4) Other Roadways

For roadways where the traveled way is more than two lanes in any direction, for each lane in addition to two, add the lane width for the highway functional class from Chapter 1140 to the width from 1240.04(2).

For three-lane ramps with HOV lanes, see Chapter 1410.

(5) Total Roadway Width

Full design shoulder widths for the highway functional class or ramp are added to the traveled way width to determine the total roadway width.

Small amounts of widening add to the cost with little added benefit. When the traveled way width for turning roadways results in widening less than 0.5 foot per lane or a total widening of less than 2 feet on existing roadways that are to remain in place, it may be disregarded.

When widening the traveled way:

- Widening may be constructed on the inside of the traveled way or divided equally between the inside and outside. Do not construct widening only on the outside of a curve.
- Place final marked lane lines, and any longitudinal joints, at equal spacing between the edges of the widened traveled way.
- Provide widening throughout the curve length.
- For widening on the inside, make transitions on a tangent where possible.
- For widening on the outside, develop the widening by extending the tangent. This avoids the appearance of a reverse curve that a taper would create.
- For widening of 6 feet or less, use a 1:25 taper. For widths greater than 6 feet, use a 1:15 taper.

1240.05 Documentation

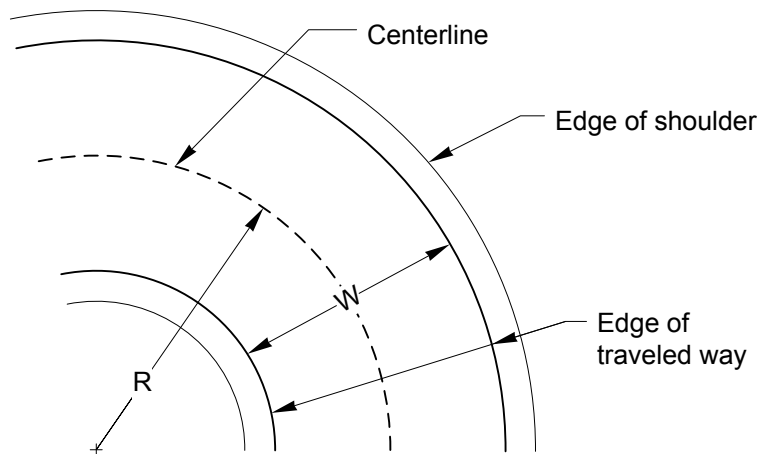
For the list of documents required to be preserved in the Design Documentation Package and the Project File, see the Design Documentation Checklist:

☞ www.wsdot.wa.gov/design/projectdev/

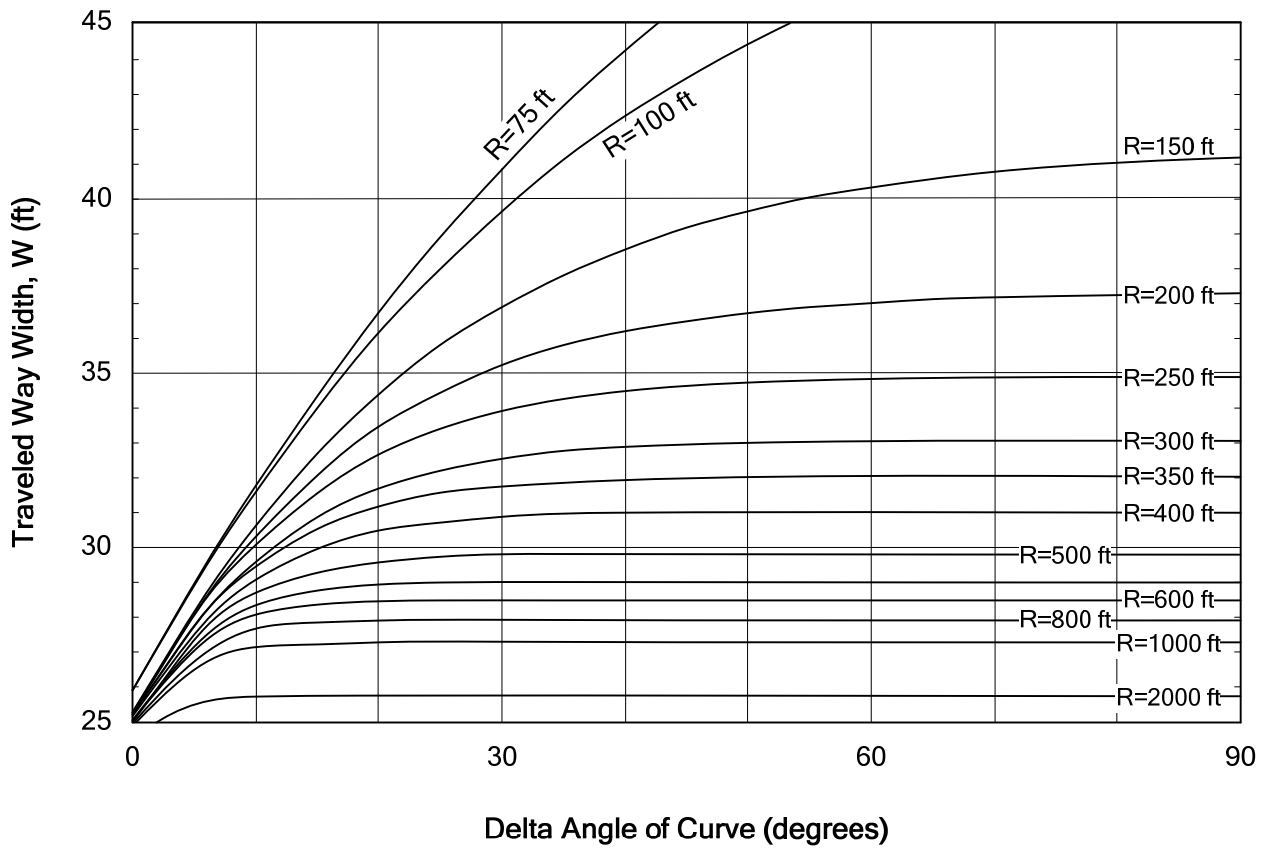
Radius on Centerline of Traveled Way, R (ft)	Design Traveled Way Width, W (ft) ^[1]
3000 to tangent	24
2999	25
2000	26
1000	27
800	28
600	29
500	30
400	31
350	32
300	33
250	35
200	37
150	41

Note:

[1] Width (W) is for facilities with 12-ft lanes. When 11-ft lanes are called for, width may be reduced by 2 ft.



Traveled Way Width for Two-Lane Two-Way Turning Roadways
Exhibit 1240-1a



Note:

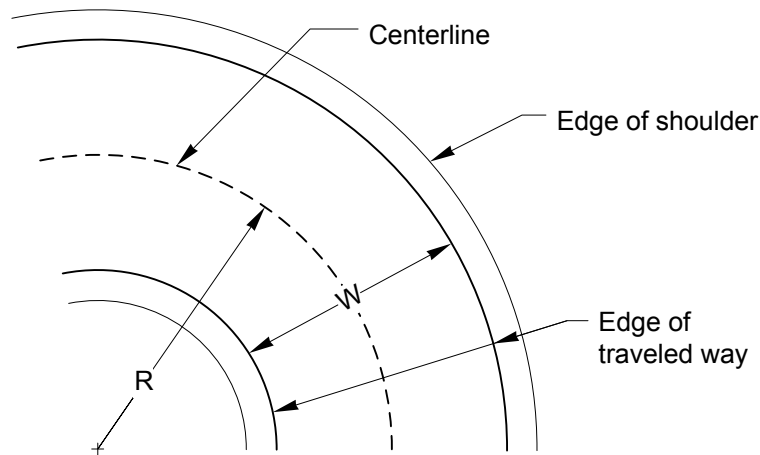
Width (W) is for facilities with 12-ft lanes. When 11-ft lanes are called for, width may be reduced by 2 ft.

**Traveled Way Width for Two-Lane Two-Way Turning Roadways:
Based on the Delta Angle**
Exhibit 1240-1b

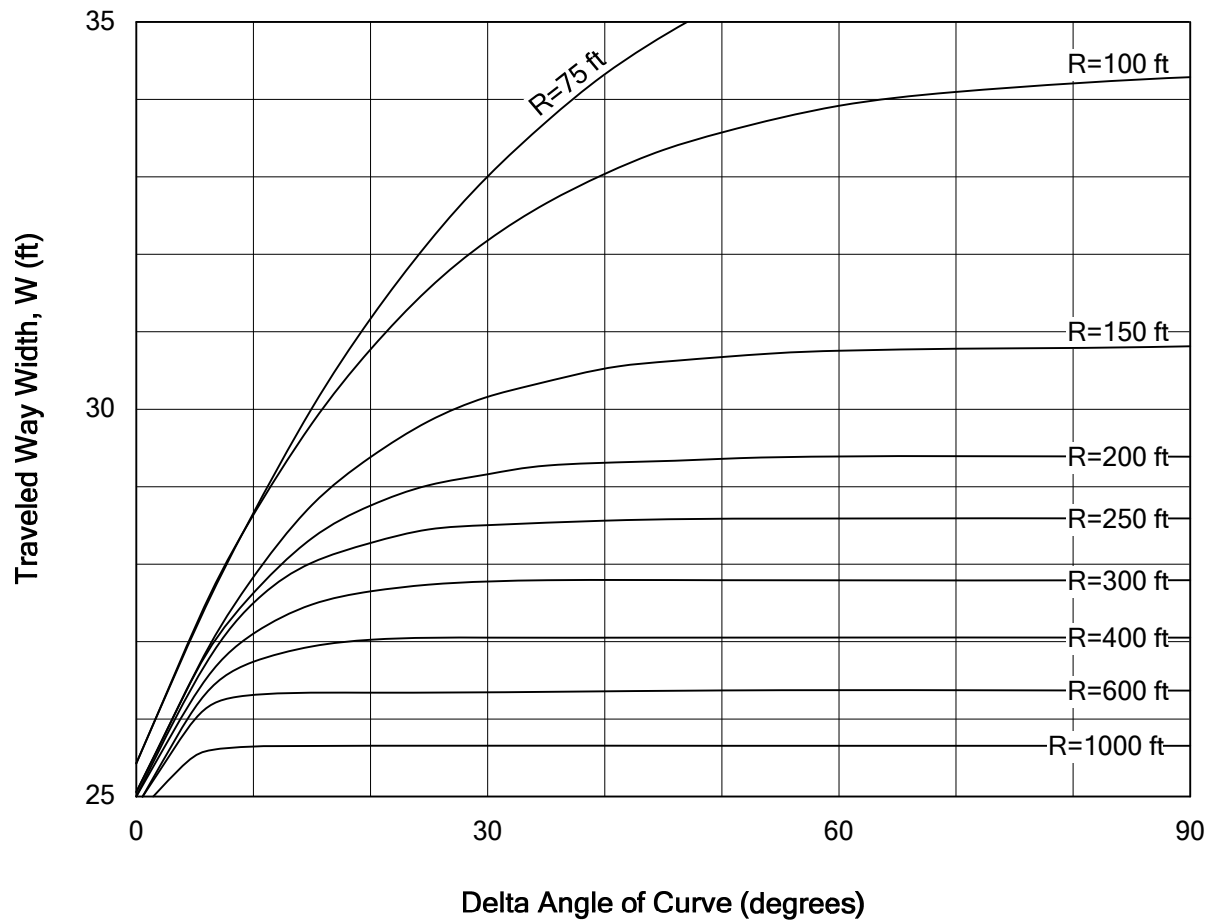
Radius on Centerline of Traveled Way, R (ft)	Design Traveled Way Width, W (ft) ^[1]
3000 to tangent	24
1000 to 2999	25
999	26
600	26
500	27
400	27
300	28
250	29
200	29
150	31
100	34

Note:

[1] Width (W) is for facilities with 12-ft lanes. When 11-ft lanes are called for, width may be reduced by 2 ft.



Traveled Way Width for Two-Lane One-Way Turning Roadways
Exhibit 1240-2a



Note:

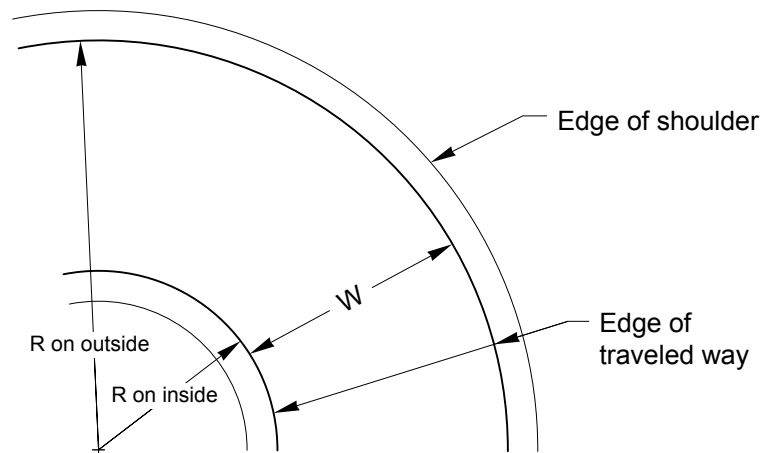
Width (W) is for facilities with 12-ft lanes. When 11-ft lanes are called for, width may be reduced by 2 ft.

**Traveled Way Width for Two-Lane One-Way Turning Roadways:
Based on the Delta Angle**
Exhibit 1240-2b

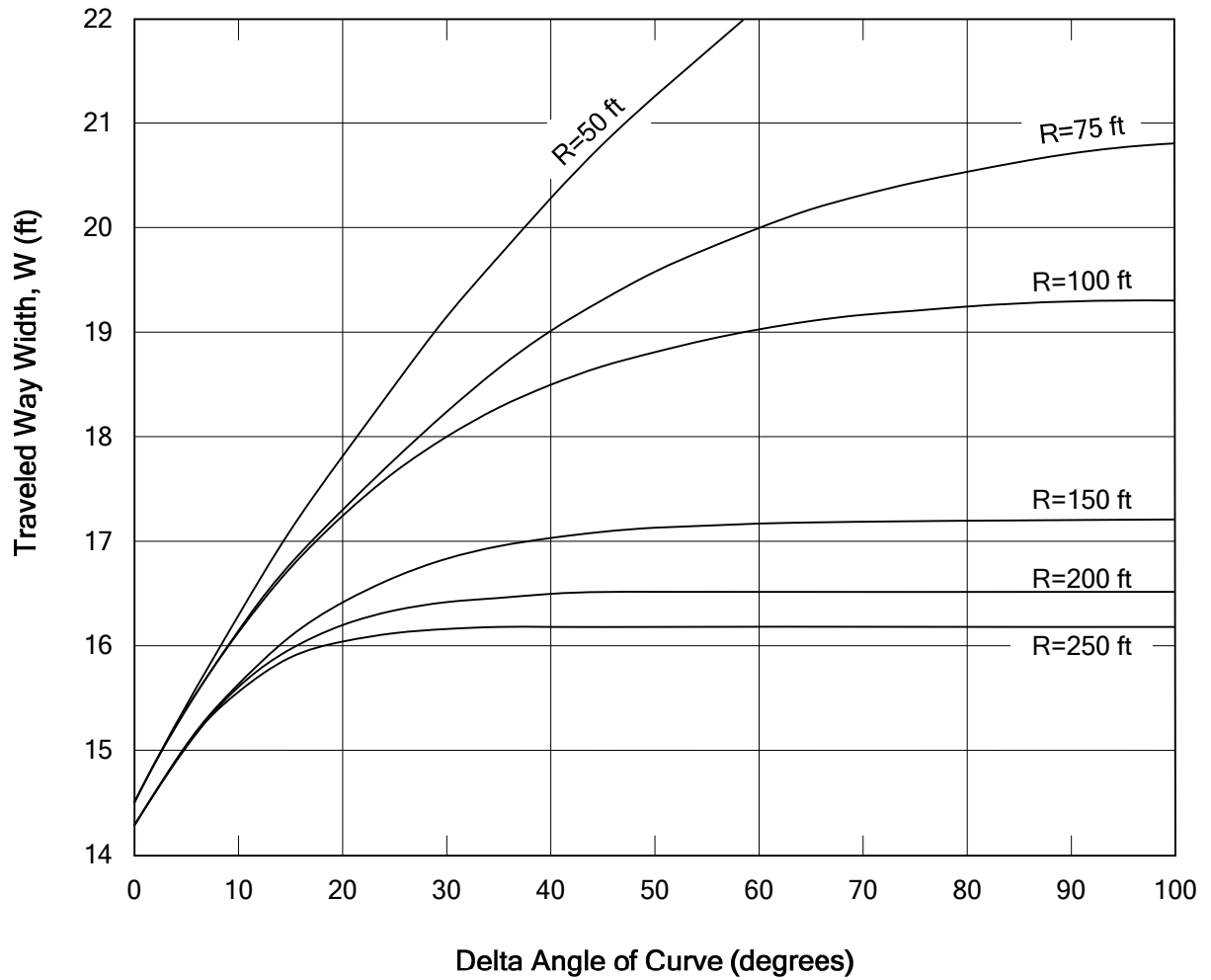
Radius, R (ft)	Design Traveled Way Width, W (ft)	
	Radius on Outside Edge of Traveled Way	Radius on Inside Edge of Traveled Way
7500 to tangent	13 ^[1]	13 ^[1]
1600	14	14
300	15	15
250	16	16
200	17	17
150	17	17
100	19	18
75	21	19
50	26	22

Note:

[1] On tangents, the minimum lane width may be reduced to 12 ft.

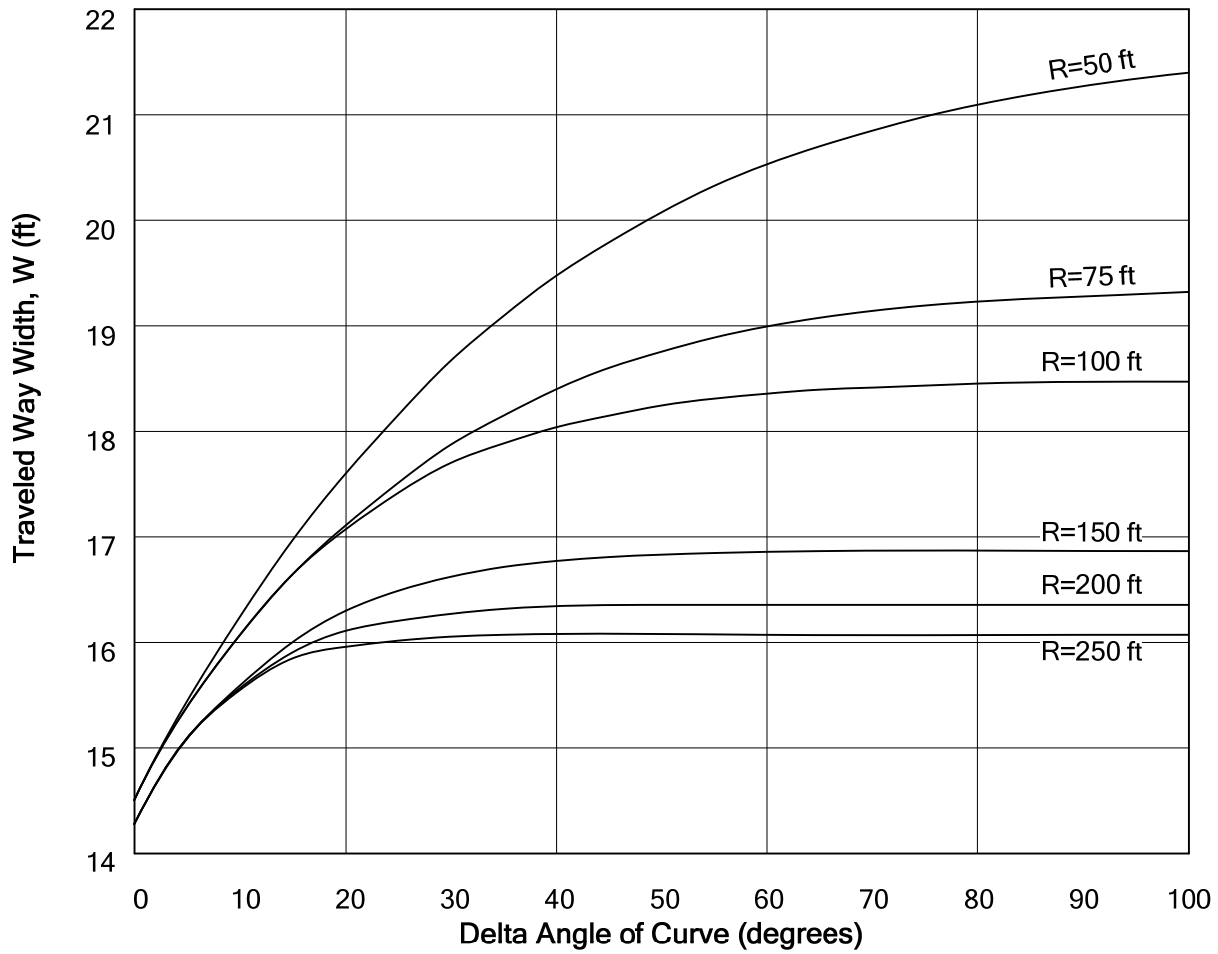


Traveled Way Width for One-Lane Turning Roadways
 Exhibit 1240-3a



Note:
All radii are to the outside edge of traveled way.

**Traveled Way Width for One-Lane Turning Roadways:
Based on the Delta Angle, Radius on Outside Edge of Traveled Way**
Exhibit 1240-3b



Note:
All radii are to the inside edge of traveled way.

**Traveled Way Width for One-Lane Turning Roadways:
Based on the Delta Angle, Radius on Inside Edge of Traveled Way**
Exhibit 1240-3c