4-LANE WITH TWO-WAY LEFT-TURN LANES

GENERAL NOTE
1. For pavement markings refer to Index No. 17346.

DESMAN

ADD LANE

LANE DROP

SPEED

(mph)

<30

30-45

>45

T_a

T_d

T_{a_d}

CR

CR

Varies

Varies

T_a

See Index No. 301. For
Deceleration Length (L)

See Index No. 301. For
Queue Length

4-LANE UNDIVIDED FLARED - SYMMETRICAL

INTERSECTION TURNS AND STORAGE
### Design Standards

**Left Side Widening**

- For Deceleration Length ($L_d$)
- See Index No. 301

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>$L_d$ (ft.)</th>
<th>Minimum Under Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>120</td>
<td>170</td>
</tr>
<tr>
<td>40</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>50</td>
<td>180</td>
<td>240</td>
</tr>
</tbody>
</table>

**Centered Widening**

- For Deceleration Length ($L_d$)
- See Index No. 301

**Right Side Widening**

- For Deceleration Length ($L_d$)
- See Index No. 301

---

**FLARED & PAINTED LEFT TURNS FOR 2-LANE 2-WAY ROADWAYS**

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>$L_d$ (ft.)</th>
<th>Minimum Under Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>120</td>
<td>170</td>
</tr>
<tr>
<td>40</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>50</td>
<td>180</td>
<td>240</td>
</tr>
<tr>
<td>60</td>
<td>240</td>
<td>290</td>
</tr>
<tr>
<td>70</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>80</td>
<td>360</td>
<td>420</td>
</tr>
<tr>
<td>90</td>
<td>420</td>
<td>500</td>
</tr>
</tbody>
</table>

---

**Queue Length**

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Queue Length (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>300 (Desirable)</td>
</tr>
<tr>
<td>40</td>
<td>360 (Desirable)</td>
</tr>
<tr>
<td>50</td>
<td>480 (Desirable)</td>
</tr>
</tbody>
</table>

---

**Minimum Under Constraints**

- Minimum deceleration length for left turns
- Minimum queue length for left turns
- Minimum flared length for left turns
4-LANE DIVIDED TO 4-LANE UNDIVIDED

4-LANE DIVIDED TO 2-LANE UNDIVIDED

4-LANE UNDIVIDED TO 2-LANE UNDIVIDED

LANE DIVERGENCE AND CONVERGENCE FOR CENTERED ROADWAYS

\[ L = \frac{WS}{T} \geq 45 \text{ mph} \]
\[ L = \frac{WS}{120} < 45 \text{ mph} \]

\[ L = 12S \geq 45 \text{ mph} \]
\[ L = \frac{S}{5} < 45 \text{ mph} \]
CONNECTING FLARE WITH PAVED SHOULDERS TO EXISTING ROADWAY WITHOUT PAVED SHOULDERS

CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING SYMMETRICAL FLARE WITHOUT PAVED SHOULDERS

CONNECTING ROADWAY WITH PAVED SHOULDERS TO EXISTING ASYMMETRICAL FLARE WITHOUT PAVED SHOULDERS

PAVED SHOULDER TREATMENT AT TRANSITIONS AND CONNECTIONS
**LEFT ROADWAY CENTERED ON APPROACH ROADWAY**

**TWO LANE TO FOUR LANE TRANSITION**

**NOTES FOR SHEETS 5 THRU 8**

1. The transition details as represented on sheets 5 thru 8 are intended as guidelines only. The transition lengths, curve data, nose radii and offsets are valid only for tangent alignment, design speeds ≤ 45 mph, the median widths and lane widths shown.

2. Approach lane departures (Δ = 5°) are suitable for design speeds up to 60 mph. Interior curves (Δ = 1°) are suitable for normal crown for design speeds up to 50 mph. Merging curves (Δ ≥ 5°) will require superelevation.

3. The geometrics of these schemes are associated with the standard subsectional spacing for side roads, but in any case will require modification to accommodate side road location, multilane and/or divided side roads, oblique side roads, crossover widths, storage and speed change lane requirements, and, other related features.
LEFT ROADWAY CENTERED ON THRU ROADWAY

FOUR LANE TO TWO LANE TRANSITION
RIGHT ROADWAY CENTERED ON APPROACH ROADWAY

TWO LANE TO FOUR LANE TRANSITION

\[ L = WS \text{ for speeds} = 45 \text{ mph} \]
\[ L = \frac{W S^2}{60} \text{ for speeds} \leq 40 \text{ mph} \]

Where:
- \( W \) = Width of lateral transition in feet.
- \( S \) = Design speed.
RIGHT ROADWAY CENTERED ON THRU ROADWAY

FOUR LANE TO TWO LANE TRANSITION

L = WS for speeds = 45 mph
L = WS/2 for speeds ≤ 40 mph

Where:
W = Width of lateral transition in feet
S = Design speed.