Chapter 4: Roadways

Roadways Overview

- Road standards
- Stopping sight distance
- Cross section
- Roadway surface
- Curves
- Pavement edge drop-offs

Appropriate Standards

- AASHTO “Green Book”
- AASHTO low-volume roads book
- Adopt your own
Consistency

• Stopping sight distance
• Decision sight distance
• Intersection sight distance

Sight Distance
Stopping Sight Distance

Reaction distance

+ Braking distance

Stopping sight distance

Driver eye height = 42 in
Object height = 24 in

Stopping Sight Distance on Horizontal Curves

Centerline of near lane

Line of sight

Sight obstruction

Road centerline
Cross Section Elements

- Cross slopes
- Lane width
- Shoulders and curbs
- Roadside slopes

Lane Widths

- Higher functional class roads → wider lanes
  - 9 ft for low volume low speed
  - 12 ft for arterials and freeways
- Add 1 to 2 ft next to curb

Safety Effects of Lane Width
Shoulders

- Crash reduction
  - High-volume roads
  - Bicyclists and pedestrians
- Support pavement
- Improve drainage

Safety Effects of Shoulders

<table>
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<th>Accident Modification Factor</th>
<th>Average Daily Traffic (veh/day)</th>
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<tr>
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Edge Drop-Offs
Edge Drop-Offs 2

Pavement Edge Drop-Off Video

Road Surface

- Wet weather crashes increased by
  - Poor drainage
  - Slippery pavement
- Rough pavement decreases tire/road contact
- Pavement management
Curves

• Common curve crash types
  – Run-off-road
  – Head-on
  – Opposite direction sideswipe
• Lane-following problems

Curve Safety Example

• Curve warning signs
• Chevrons or arrows
• Delineators
• Pavement markings
Curve Signing Example

Safety Widening

- Widen lanes on sharp curves
- Cheaper than widening whole road

Curve Widening Example
Curve Widening Example 2

Roadways Summary

- Road standards
- Cross section
- Surface
- Curves
- Pavement edge drop-offs