

Freeway Collision Trends in the USA: CURRENT & EMERGING DEFICIENCIES

Presented by:

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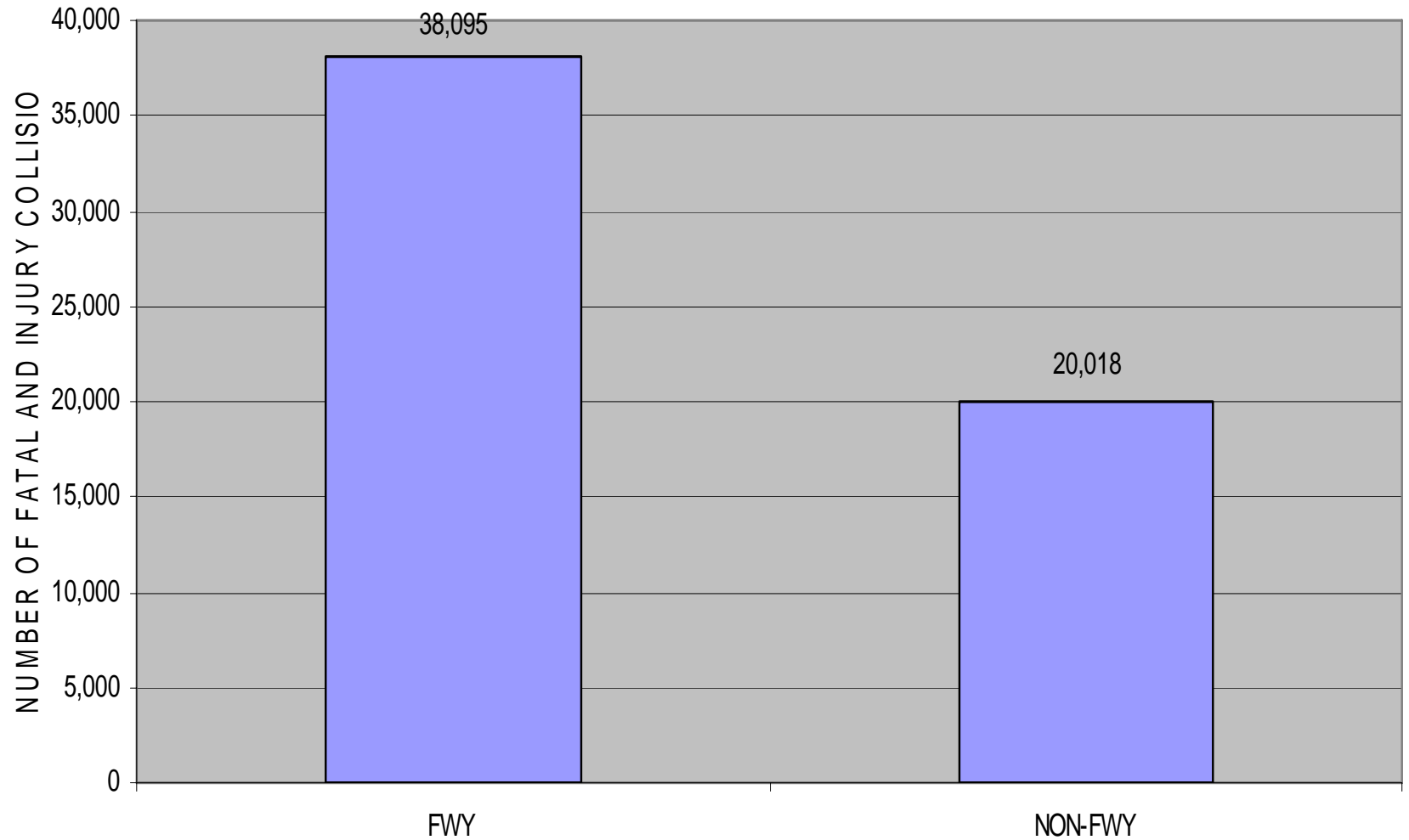


FREEWAY SAFETY PERFORMANCE

- **PERFORMANCE MEASURES:**
 - Total Collisions
 - Fatal & Injury Collisions
 - **NUMBER & RATE of Collisions**
- **COLLISION DATA:**
 - Trends
 - Analysis

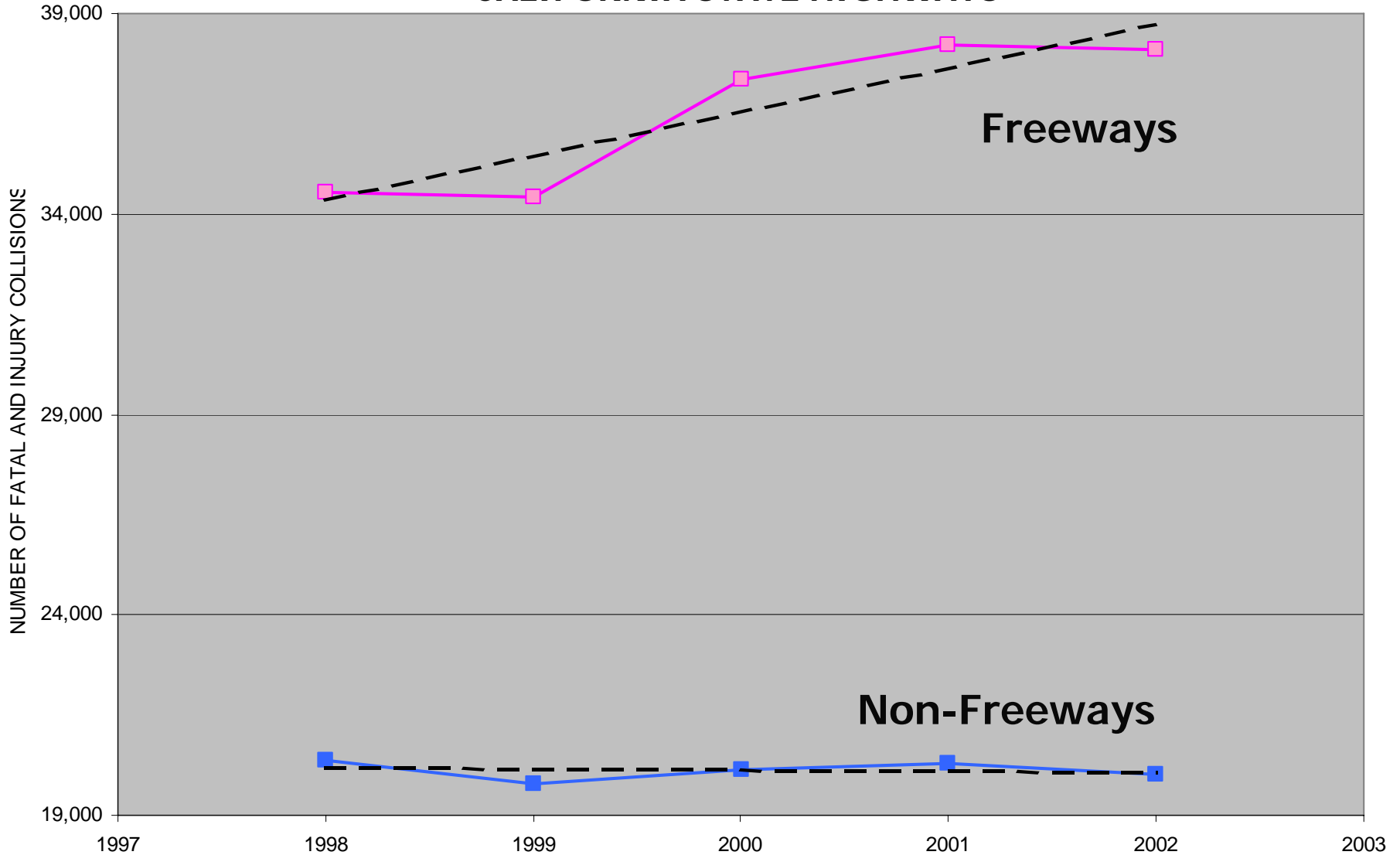
Fatal and Injury Collisions for Freeways and Non-Freeways

CALIFORNIA STATE HIGHWAYS



5-Year Trend for Fatal and Injury Collisions (1998 – 2003)

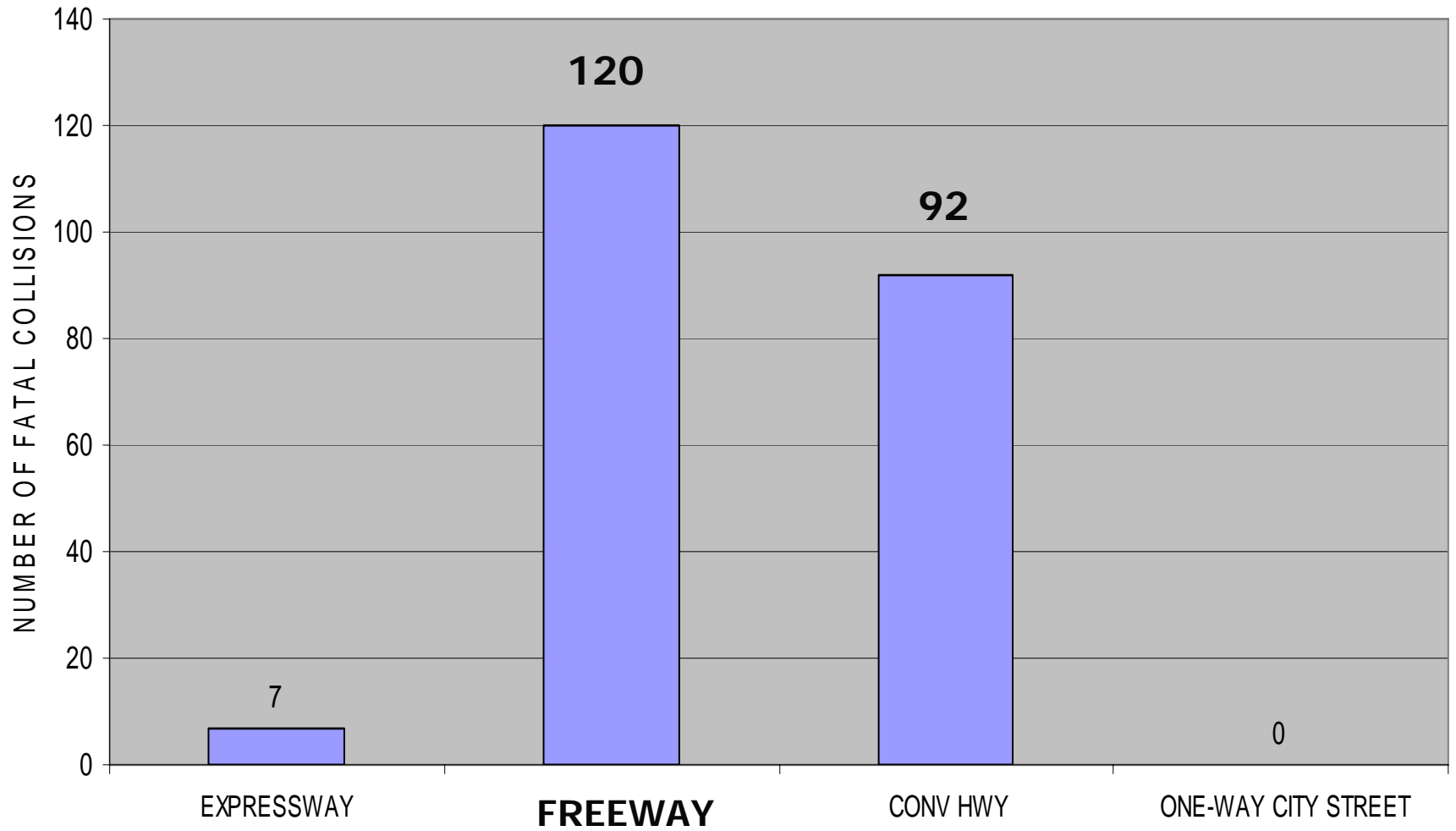
CALIFORNIA STATE HIGHWAYS



1998-2002 Collision Data on California State Highways, California Department of Transportation

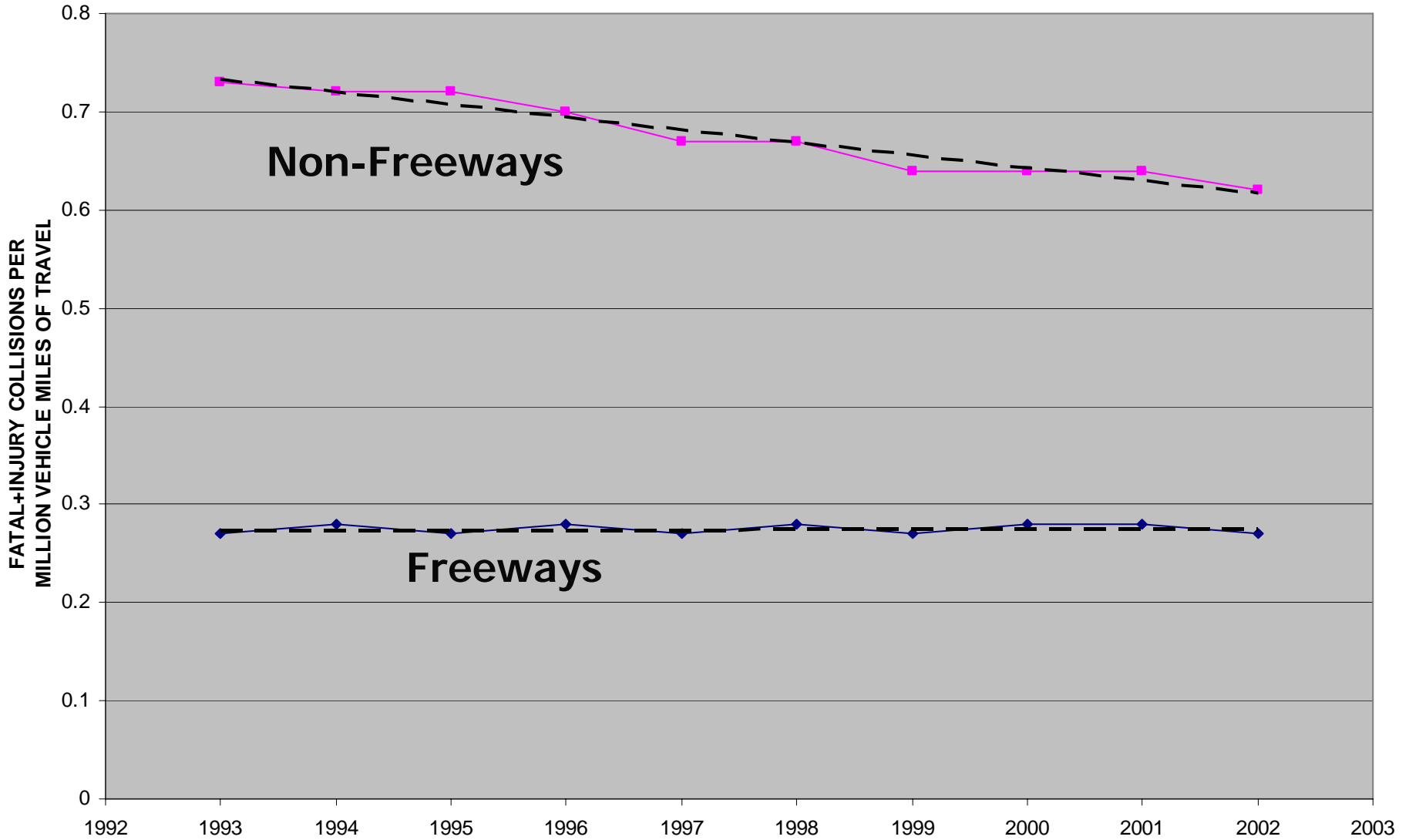
Fatal Pedestrian Collisions by Facility Type

CALIFORNIA STATE HIGHWAYS



2002 Collision Data on California State Highways, California Department of Transportation

**10- YEAR TREND FOR FATAL + INJURY COLLISIONS PER MILLION VEHICLE MILES OF TRAVEL
FOR FREEWAYS AND NON-FREEWAYS (1993-2002)**



CURRENT & EMERGING DEFICIENCIES

- **Related to:**
 - **INFRASTRUCTURE DEFICIENCIES**
 - **EXCESSIVE ACCESS**
 - **OPERATING CONDITIONS**

Current & Emerging Deficiencies: INFRASTRUCTURE

- **RELATED TO GEOMETRIC DESIGN FEATURES**
 - **Unprecedented Cross-Section Width**
 - Increased Storm Water Runoff
 - Decreased Access to Emergency Parking
 - **Unprecedented System Complexity**
 - Increased number of Decisions / Choices due to the presence of / access to:
HOV/HOT, Toll Roads, Express Lanes, etc.
 - Difficult to Satisfy Driver Expectations

Current & Emerging Deficiencies: **EXCESSIVE ACCESS**

On Freeways:


- **ACCESS POINTS = CONFLICT POINTS**
 - Merging
 - Weaving:
 - Wider X-Sections with Same Access Spacing
 - HOVL access creates 2-sided weave
- **ACCESS POINTS = DECISION POINTS**
 - Diverges

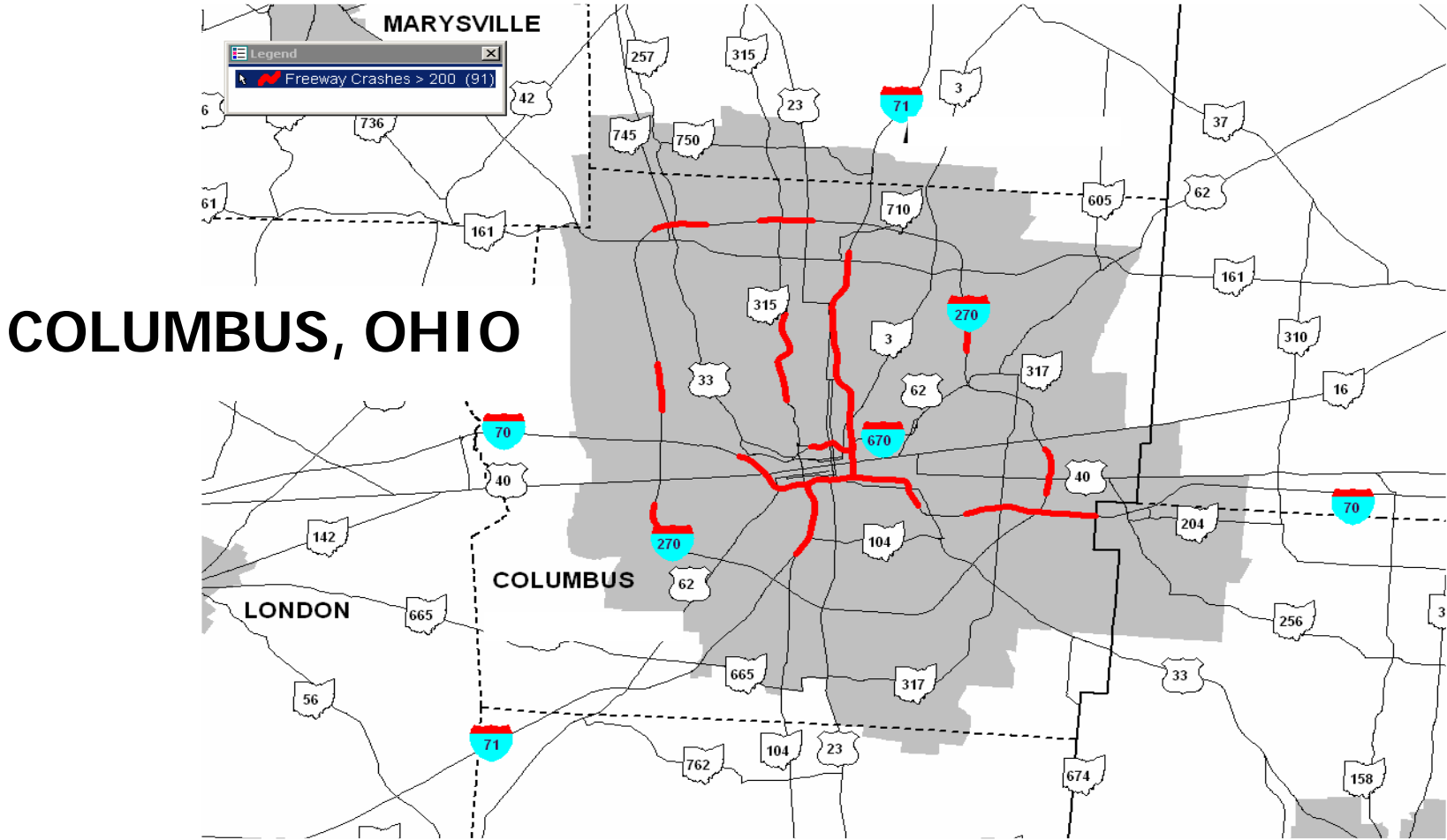
Current & Emerging Deficiencies: OPERATING CONDITIONS

- **SPEED & SPEED DIFFERENTIAL**
 - Heavy Trucks
 - HOV Lane Operation
- **VOLUME: High Volumes Expose Deficiencies**
- **DRIVER PERFORMANCE & BEHAVIOR:**
 - Fatigue (due to longer commutes)
 - Affect of Darkness (due to longer peak hours)

Current & Emerging Deficiencies: OPERATING CONDITIONS

- **UNSTABLE FLOW** (“Congestion”)
 - **Unexpected Conditions + Speed Differential**
 - **Mainline Congestion: “Stop and Go Traffic”**
 - **Localized Congestion:**
 - **Turbulence due to merge, diverge & weaving**
 - **Related to HOVL ingress / egress**

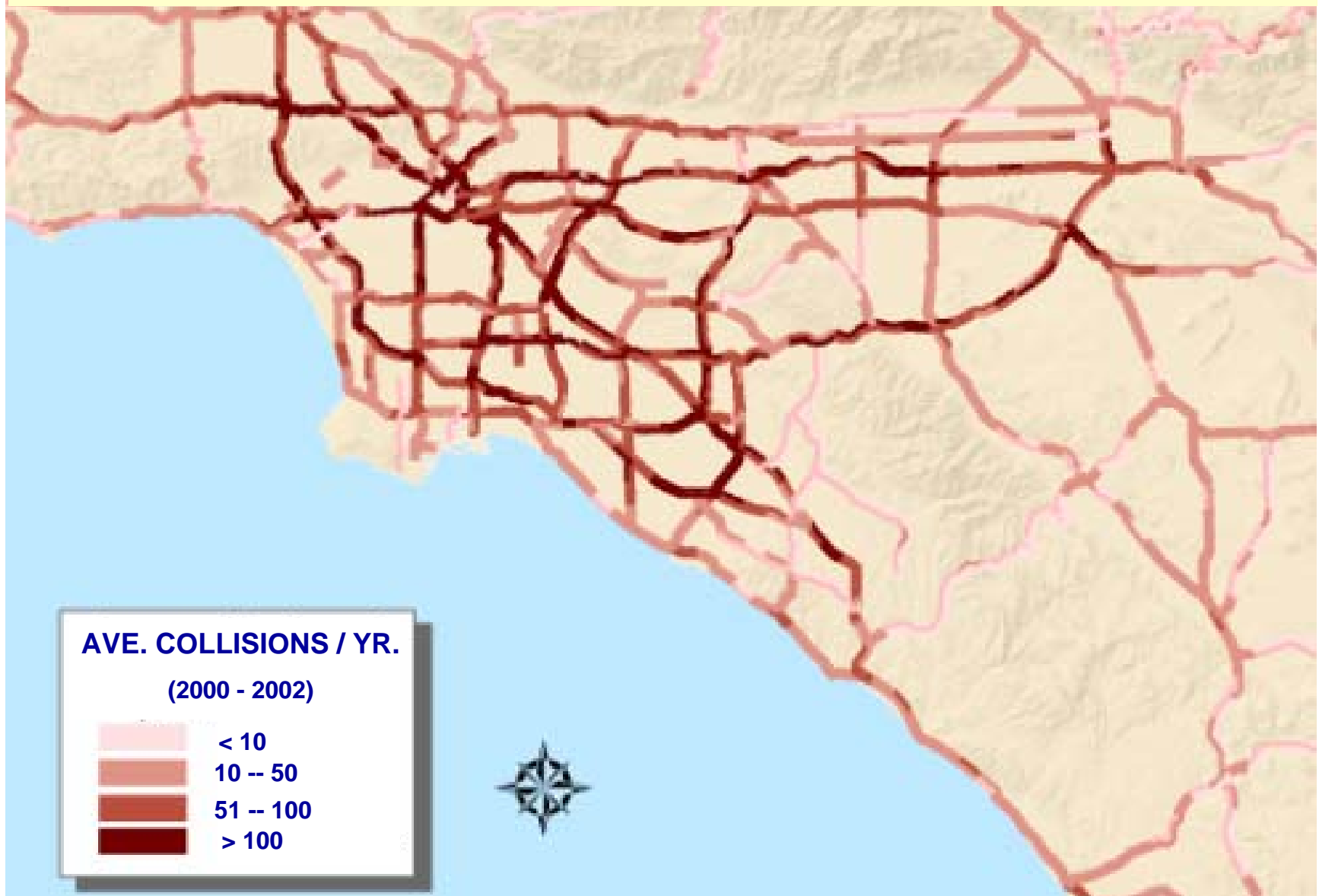
 **Freeway Collisions > 200 / mile / 3 years**



In the State of Ohio:

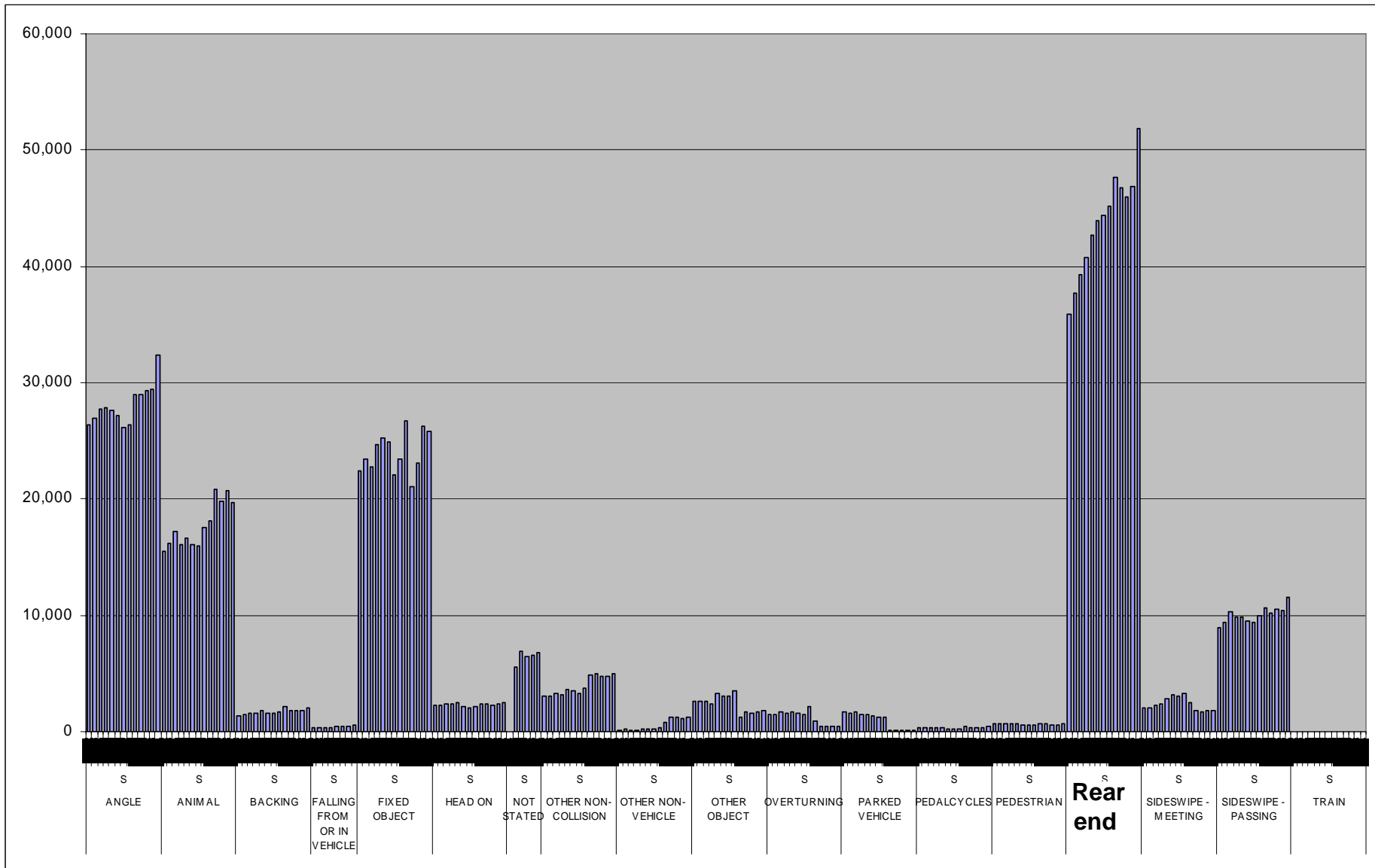
43% of Freeway Collisions occur on 12.5% of the Freeway system

LOS ANGELES BASIN FREEWAYS



Source: 2002 Collision Data on California State Highways, California Department of Transportation

Ohio State Highway System Analysis (Crashes by Type 1992-2004)

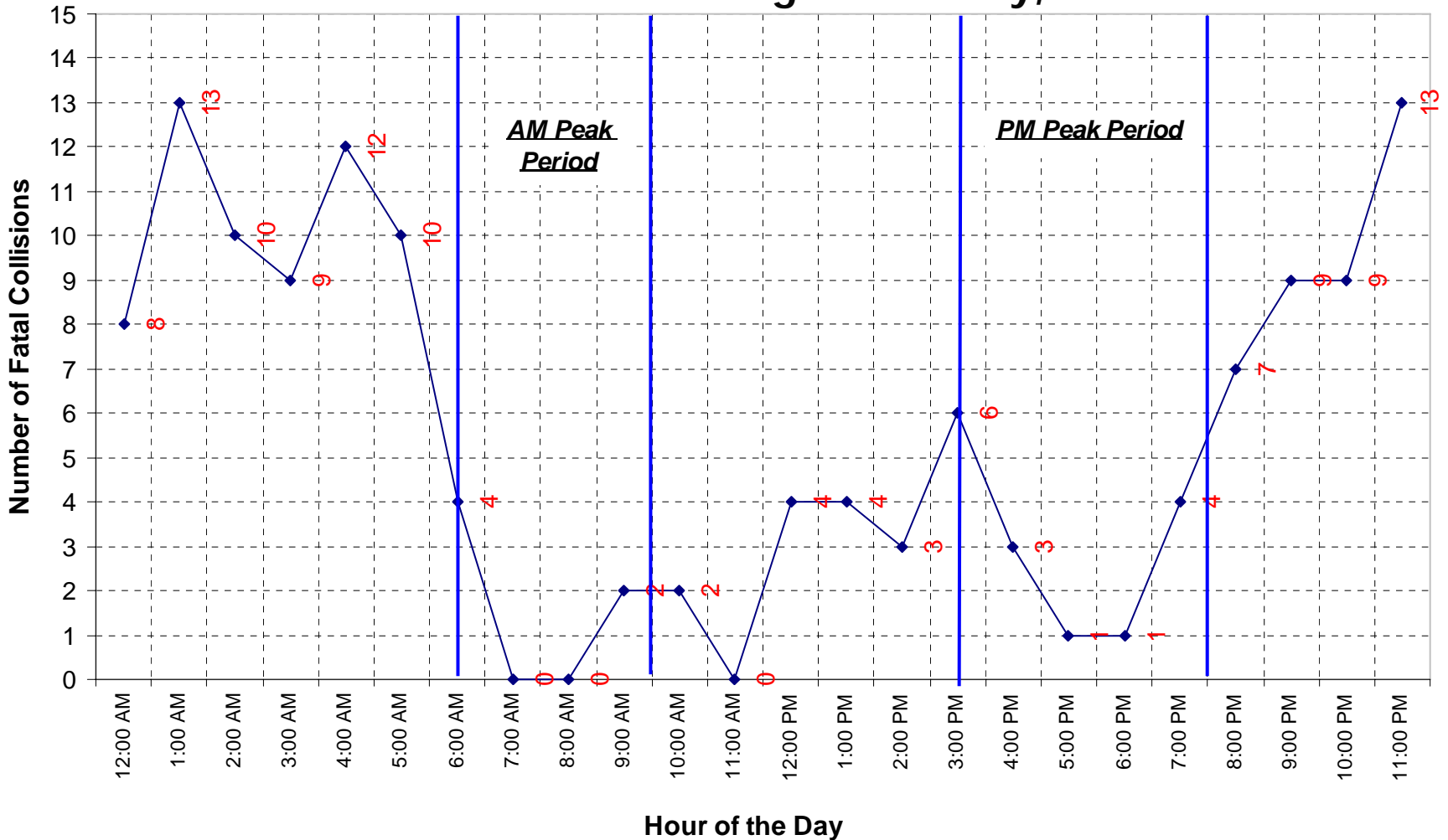


Source: Ohio Department of Transportation

Current & Emerging Deficiencies: OPERATING CONDITIONS

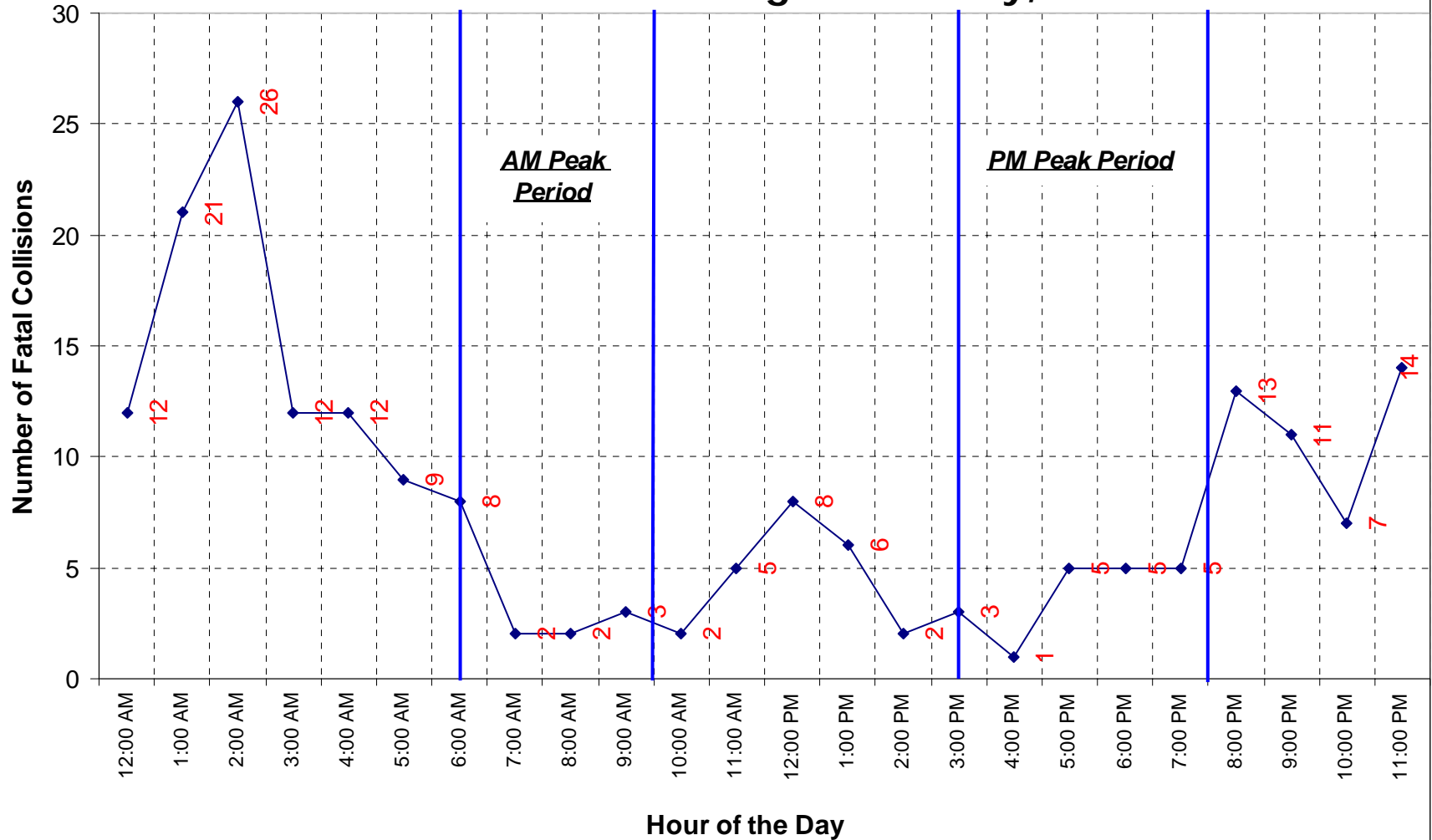
- STABLE FLOW:
 - During the “Shoulders” of the Peak Period
 - When both volumes & speeds are high

Fatal Collisions by Time of Day (1993-2002) on State Route 101 in Los Angeles County, California



Source: California Department of Transportation

Fatal Collisions by Time of Day (1993-2002) on Interstate 10 in Los Angeles County, California



Accident Summary Data - 01/01/93 to 12/31/02

Source: California Department of Transportation

OPERATING CONDITIONS

Relationships Affecting Freeway Safety

- **Recurrent Congestion & Collision Severity**
- **Congestion Relief & Speed**
- **Increased Mobility & Collision Severity**
- **MOBILITY, SAFETY & ACCESS**

Relationships Affecting Freeway Safety

- Collision Frequency Increases as Congestion Increases
- Congestion Increases as Collision Frequency Increases
 - 25-50% of All Congestion is Caused by Incidents

**COLLISIONS SEVERITY MAY INCREASE AS
CONGESTION DECREASES**

**Congestion Relief Programs & Projects Need to Recognize
and Address the Above**