Work Zone Safety Data: Looking for Insights

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Federal Highway Administration

Department of Transportation

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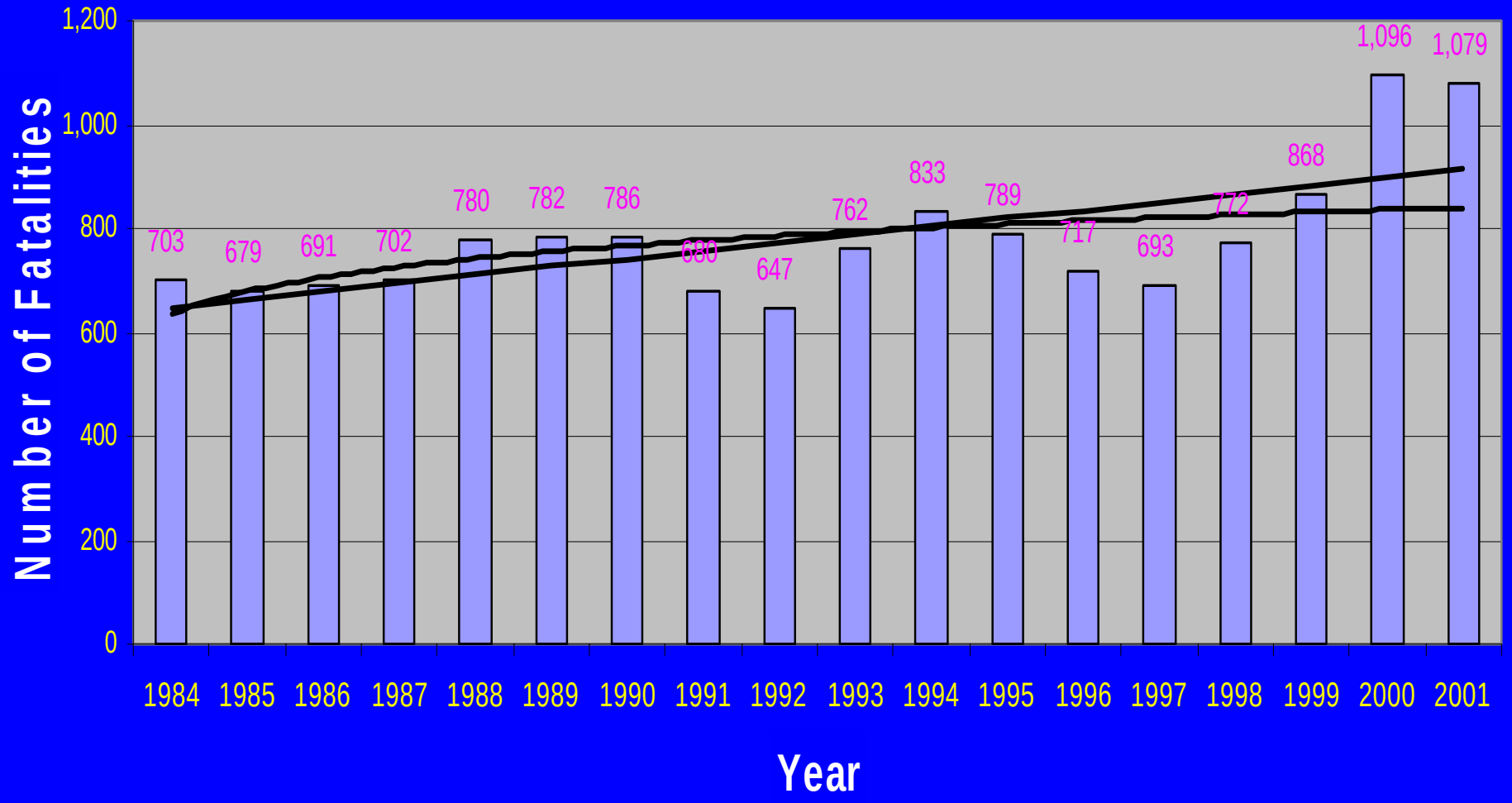
UTILITY
WORK
AHEAD

Work Zone Fatalities



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Work Zone Safety Data:

- Police crash reports
- Incident reports
- OHSA reports
- Insurance claims
- Road safety audit reports

Related Data:

- Traffic data (e.g., volumes, mix, distributions)
- Project logs
- Citation/compliance data
- Complaints
- Conditions data (e.g., weather)
- Performaance data (e.g., lighting levels)
- Driver studies (e.g., speed, lane position, car following, alertness, visual capabilities)

Goal:

DATA

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INTEGRATION & ANALYSES

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INFORMATION

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IMPROVEMENTS

FHWA Efforts:

- WZ Safety Research
- Integrated WZ Team (=> WZ Impacts Rule)
- Highway Safety Information System (HSIS)
- Model Minimum Uniform Crash Criteria (MUUCC)
- Technology Development (e.g., barriers, ITS, Quickzone)
- Construction Process Improvement (ACTT, TCCC, Highways for Life

FHWA/National Interests in Data:

- Safety Monitoring (FHWA & AASHTO goals)
- Development & Validation of Standards
  - MUTCD (WZ interface with drivers)
  - CFR (project requirements, like TCPs)
- Guidelines for Improved Practice (e.g., NCHRP 3-69 "Designs for WZs on High Speed Facilities)
- Technology Development (e.g., ITS, crash tests)
- Special Investigations (e.g., NTSB study of LEO deployments in WZs)

Others with Interests in Safety Data:

- States
  - Direct responsibilities for highways
  - Safety monitoring & improvement
  - Contracting & project oversight
  - Traffic operations
  - Liability
- Contractors
  - Risk management/insurance
  - Timely project completion
  - profit

Data Analyses:

- Descriptive statistics
  - Numbers/tabulations
  - Cross tabulations
- Comparative statistics
  - Measures of significance
  - Identification of critical factors
- Model building
  - Understand relationships
  - Apply to new situations

Work Zone Accident Exposure Study:

- Construction projects selected by States
- WZ staging & TCPs obtained (duration/lengths)
- Work zone crashes from HSIS
- Roadway features identified
- Traffic volumes estimated
- Projects logs and other data captured

Work Zone Project Database:

- Maryland: 63 projects
- Washington: 36 projects
- Minnesota: 25 projects
- California: 14 projects

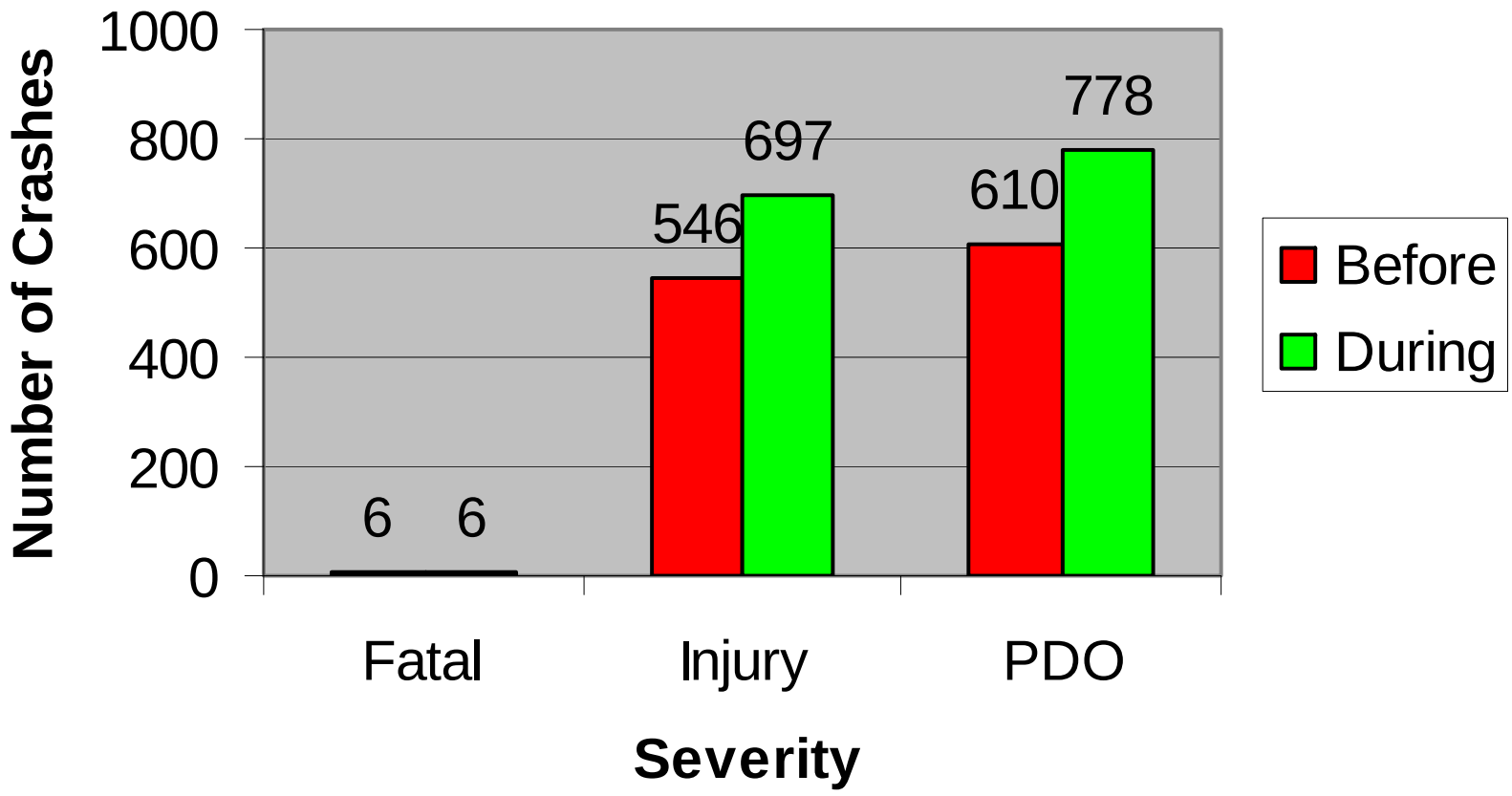
Total: 138 sites

(255 stages)

Analysis Efforts:

- Statistical analyses comparing “During” and “Before” crash rates & ratios at the:
  - Project-level
  - Stage-level
  - Work zone segment levels
- Investigate influence of:
  - project type
  - highway type
  - work zone type
  - Day/night conditions
  - Driver characteristics & behavior
  - other factors

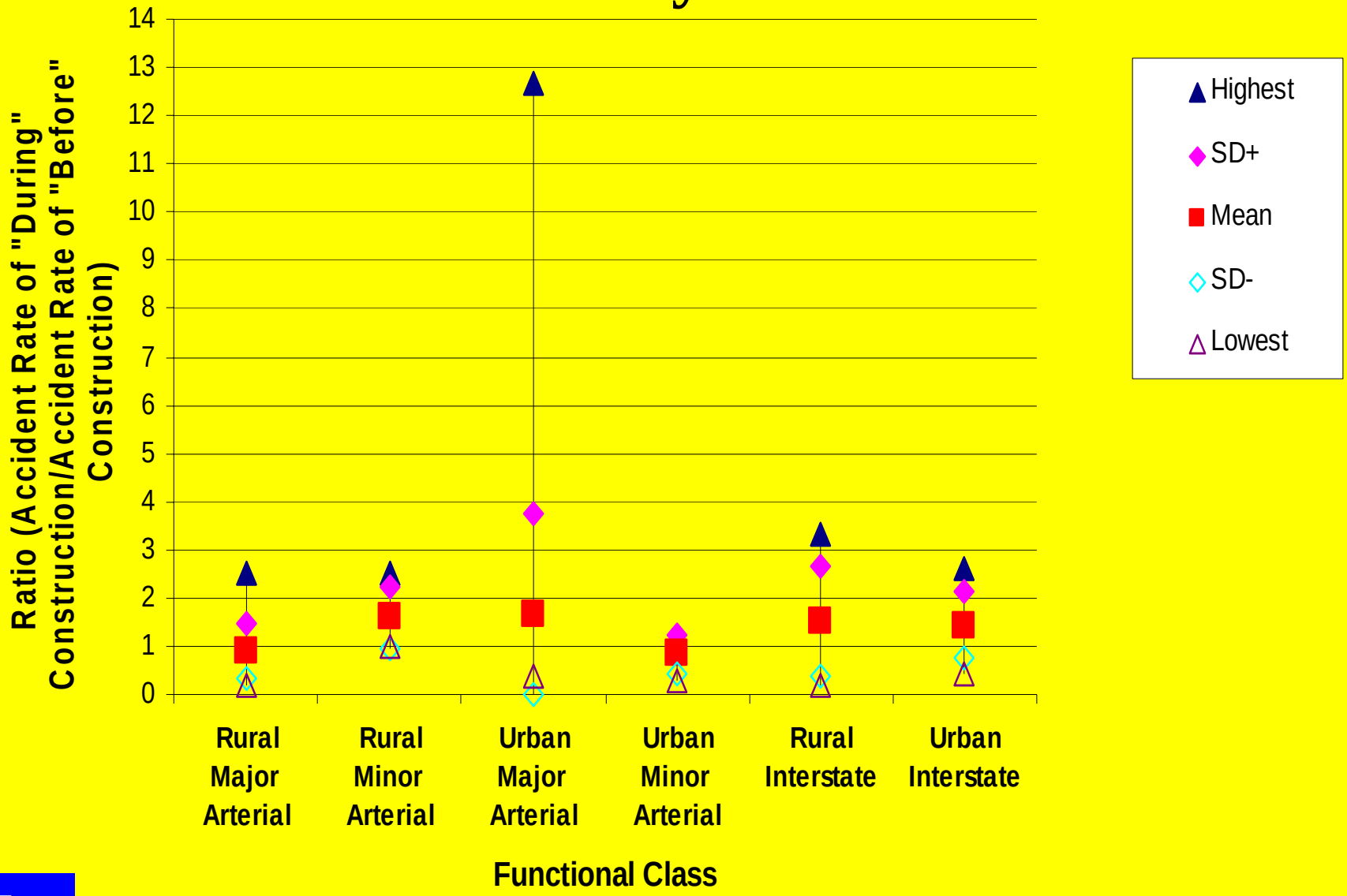
WA Before/During WZ Crashes by Severity



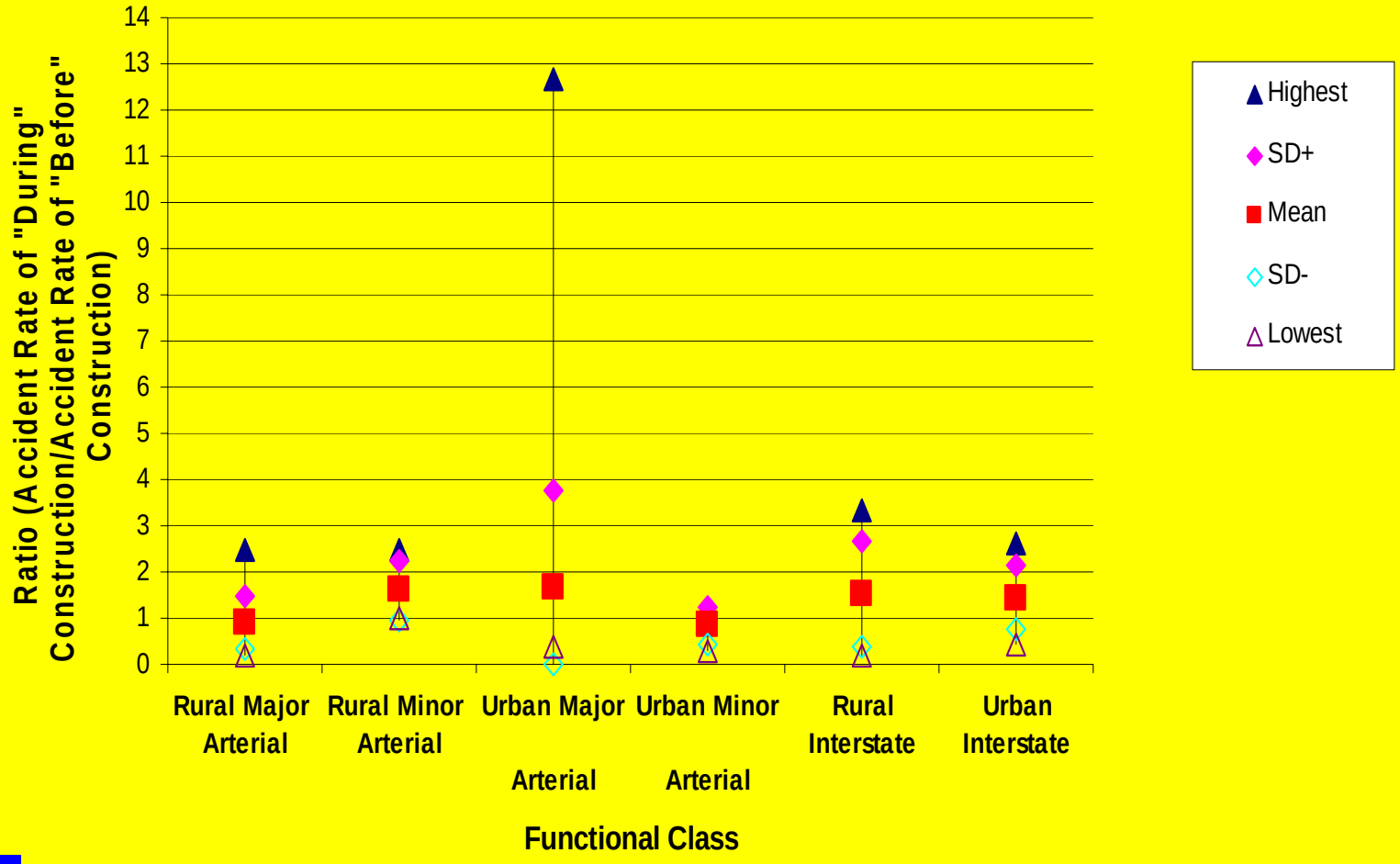
WZ Crash Severity (percentage)

State		Fatal	Injury	PDO
CA	Before	0.6	32.7	66.8
	During	0.4	31.3	68.3
WA	Before	0.4	47.0	52.5
	During	0.5	47.1	52.5
MD	Before	0.4	51.5	48.1
	During	0.4	48.1	51.6
MN	Before	0.3	29.4	70.4
	During	1.3	26.3	72.4

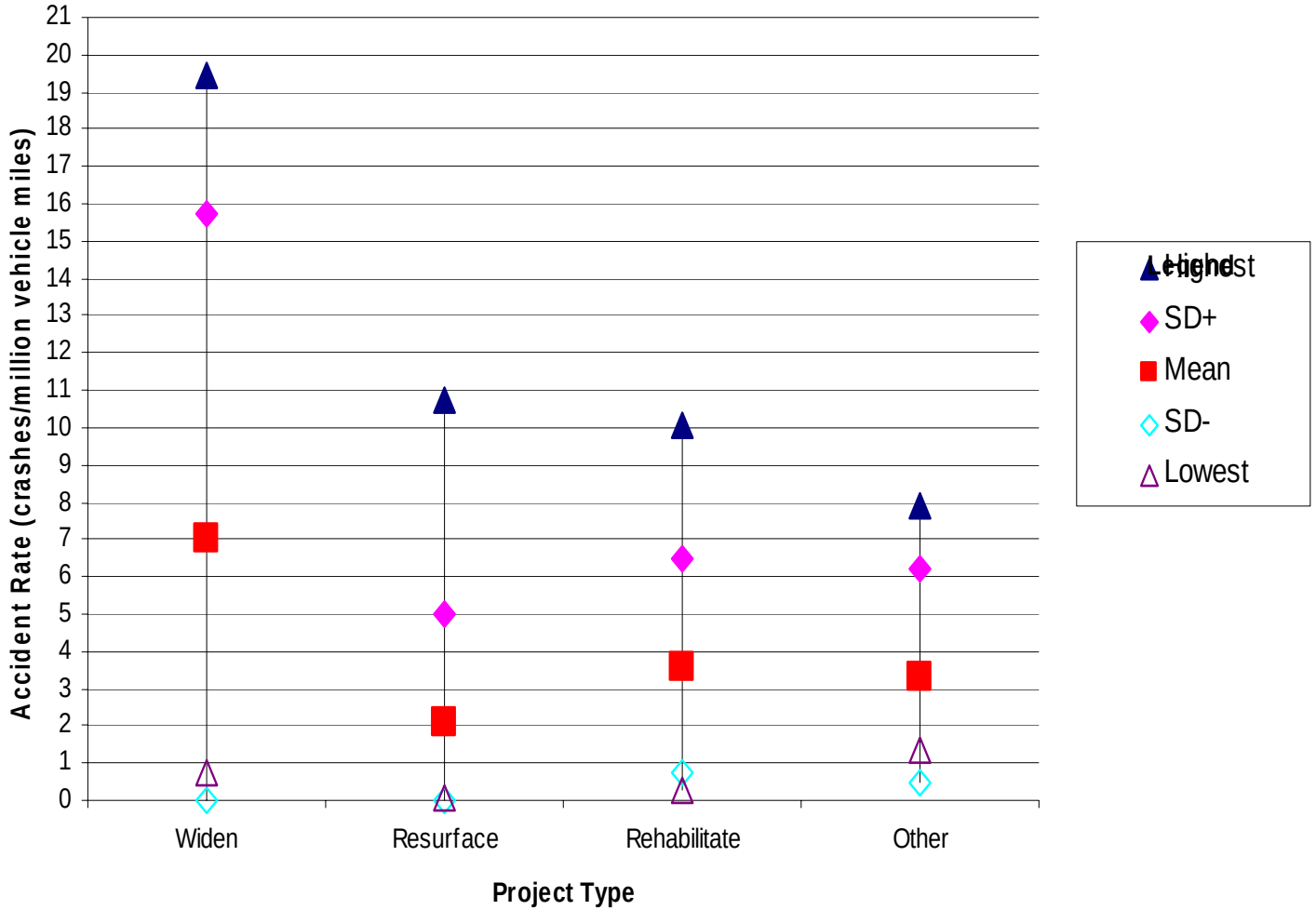
WZ Accident Rate by Functional Class



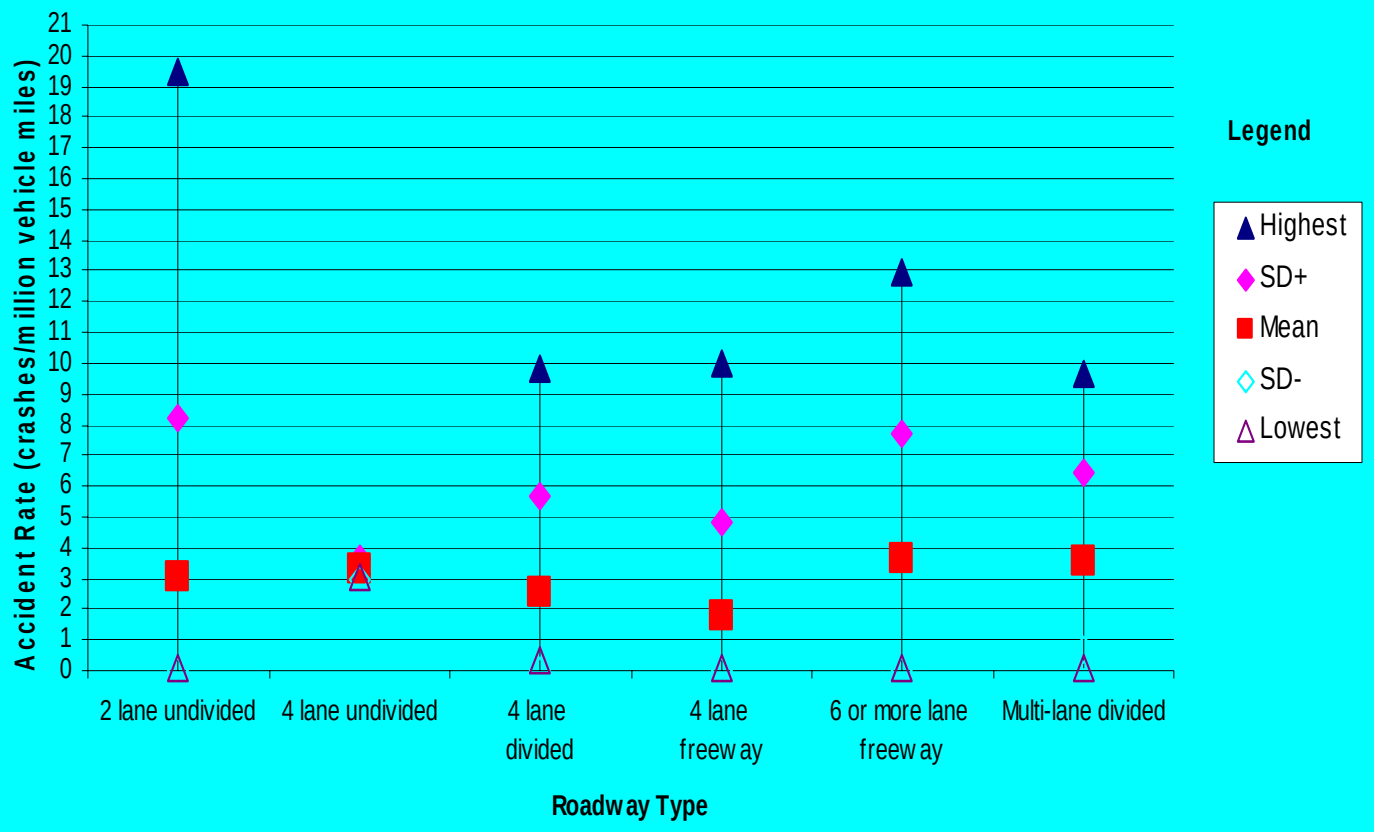
Ratio of WZ Accidents Before – During by Functional Class



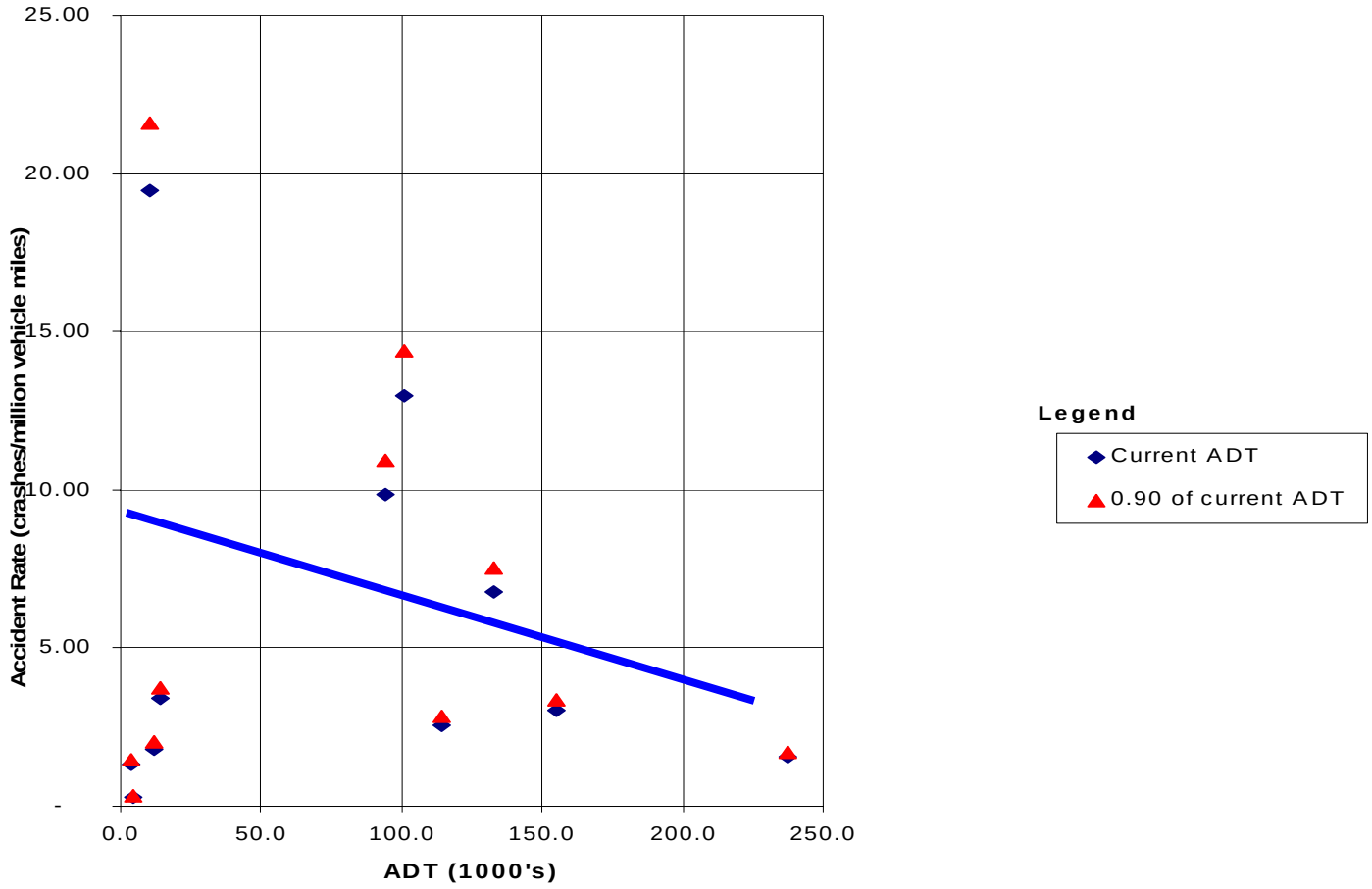
WZ Accident Rate by Type of Project



WZ Crash Rate by Road Type



CA WZ Crashes by ADT Levels



Future Agenda:

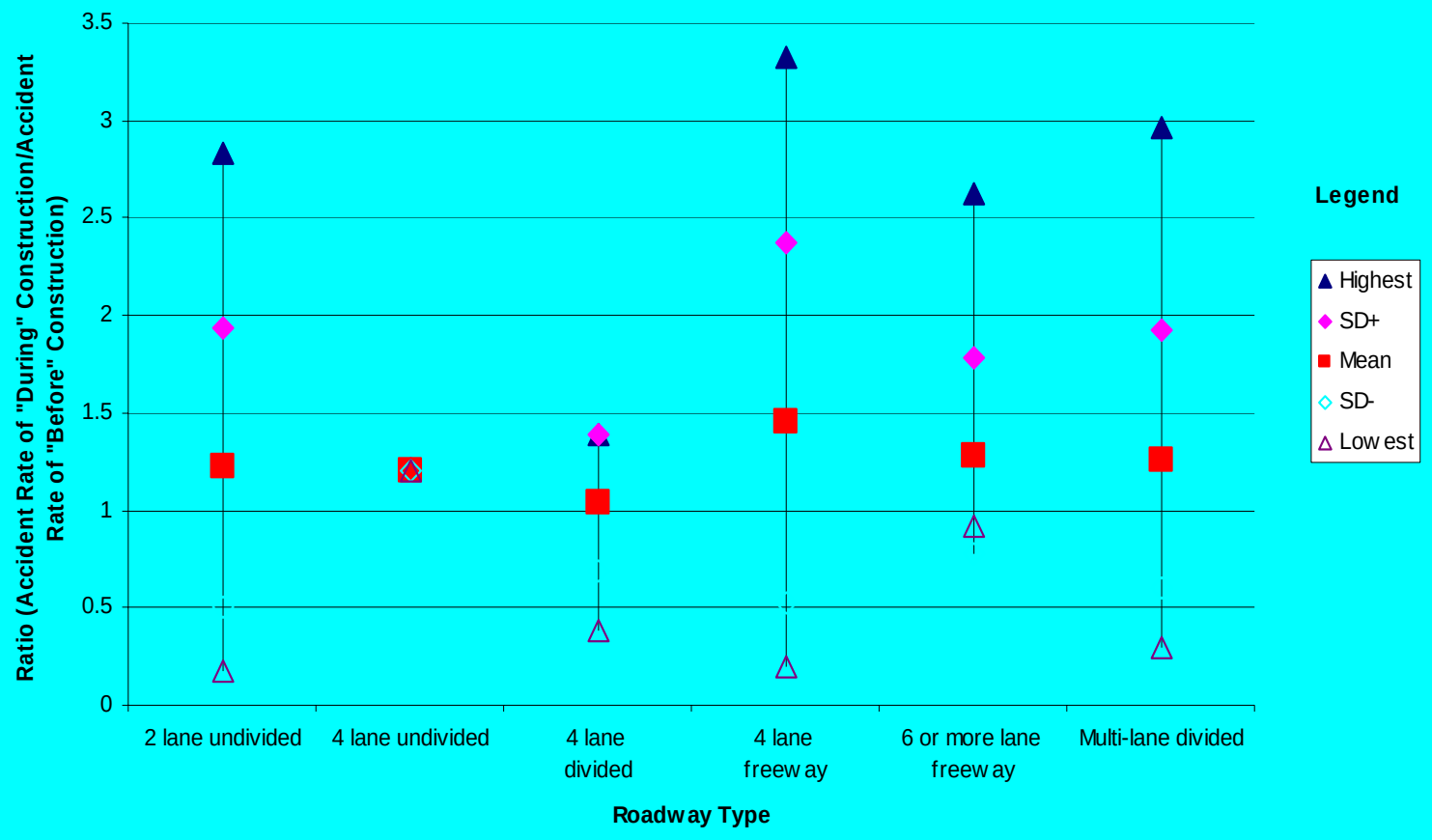
- Implementation of Impacts Rule
  - Increased effort to gather WZ data
  - Use of data for WZ safety & mobility management
  - Periodic reviews to improve policies & practices
- Development of tools & technologies
- Modification & additions to WZ standards & guidelines

ARTBA/Contractors Role:

- Promote safety
- Support safety directors
- Help build better understanding with data
  - Attention to details
  - Timely reporting
- Regular monitoring of safety trends

Questions ??????

Ratio of Before-During WZ Crashes by Road Type



Ratio of Before-During WZ Crashes by Project Type