HSM DDSA Peer Exchange

Utah's Experience with Performance Based Practical Design/Analysis of Design Exceptions

UDOT Traffic & Safety | 10 July, 2018

UDOT Keeping Utah Moving

Zero Fatalities

Problem Statement

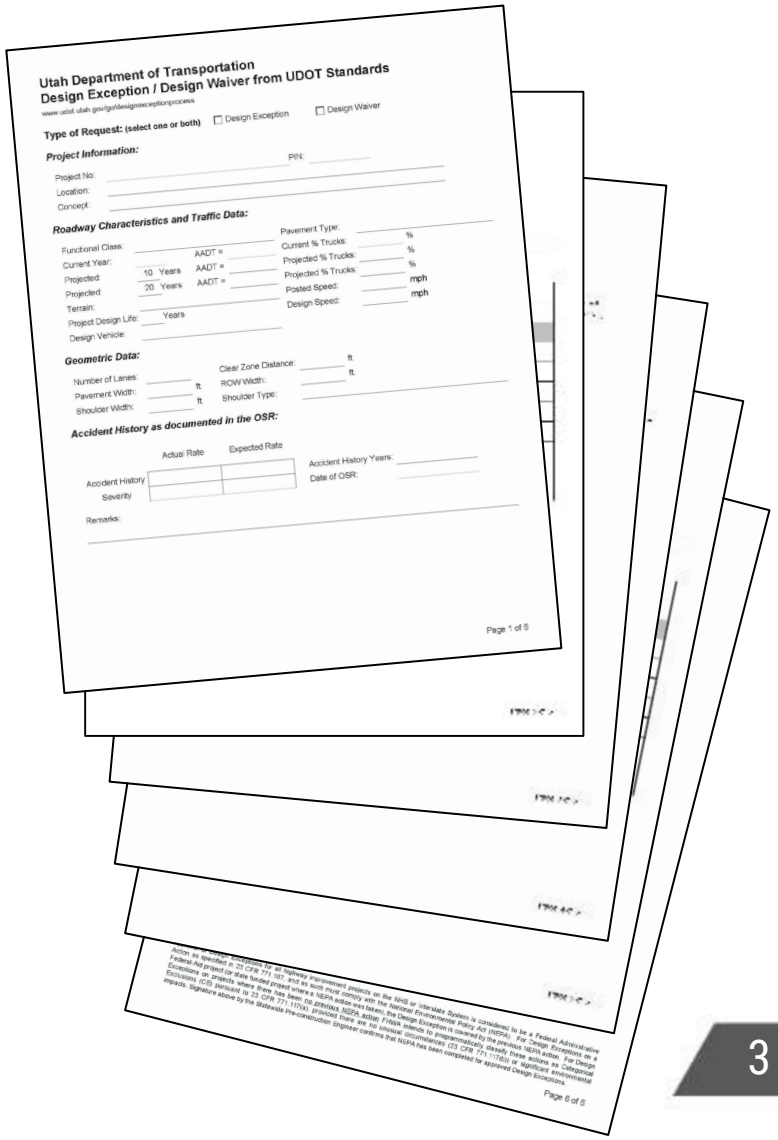
Assumption: Sub-standard Design ≈ Risk

Impact to safety

- Is it quantifiable?
- Is a documentation process necessary/valuable?

UDOT Design Exception

- Required when the design deviates from UDOT Standards
- Based on data driven engineering and safety analysis
- Rigorous review/approval process
- Approved on a case-by-case basis



UDOT Design Exception

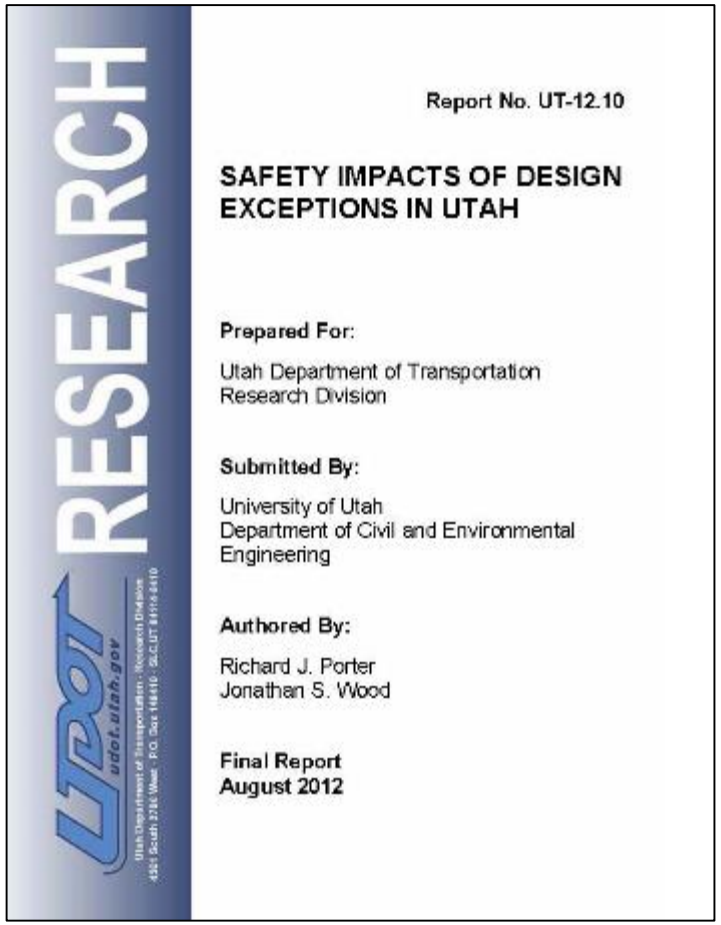
Required Information

- Roadway characteristics
- Traffic data
- Crash history
- Programmed future improvements
- Project cost
  - As proposed
  - To meet standards
- Specific change proposed

UDOT Design Exception Study

2012 – University of Utah Study

- Compared crash frequency and severity
- Looked at 48 locations with exceptions
- 132 locations with no exceptions
- Used three different methods, including Bayesian predictive models and propensity scores


RESEARCH

udot.utah.gov

Report No. UT-12.10

SAFETY IMPACTS OF DESIGN EXCEPTIONS IN UTAH

Prepared For:

Utah Department of Transportation
Research Division

Submitted By:

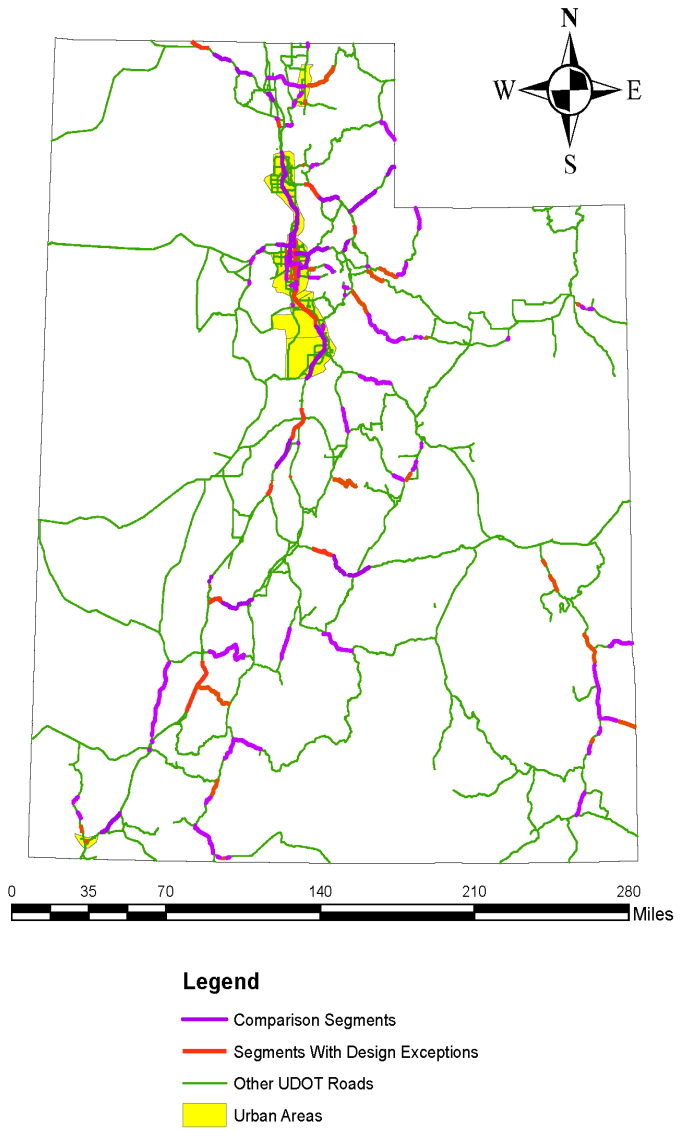
University of Utah
Department of Civil and Environmental Engineering

Authored By:

Richard J. Porter
Jonathan S. Wood

Final Report
August 2012

Study Parameters



Exceptions to design criteria for:

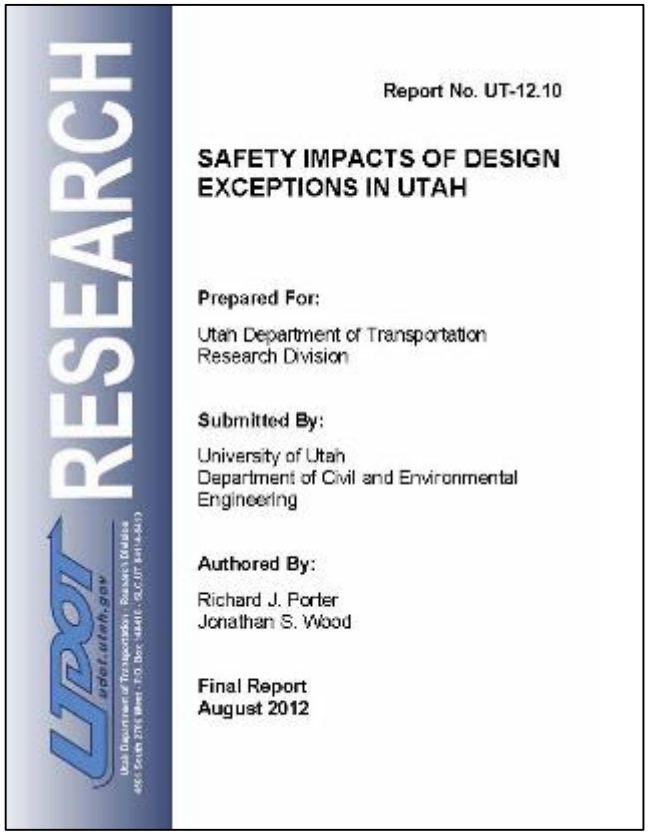
- Design speed
- Lane width
- Shoulder width
- Bridge width
- Horizontal alignment
- Superelevation
- Vertical alignment
- Grade
- Stopping sight distance
- Vertical clearance
- Cross slope
- Lateral offset to obstructions
- Structural capacity

UDOT Design Exception Study

Primary Findings:

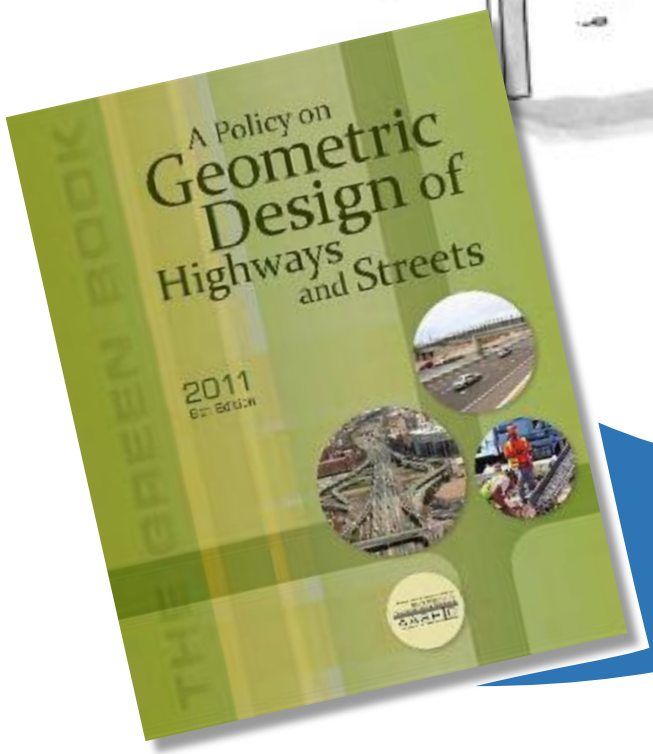
- No significant difference in crash frequency
- No significant difference in crash severity distributions

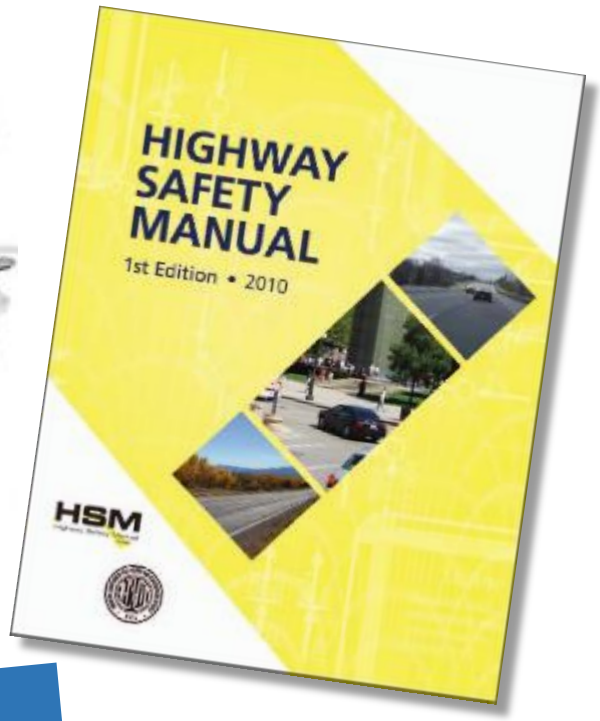
Validated that UDOT's design exception review and approval process is working



Similar studies with data from Indiana and Kentucky that yielded similar results

Evolution of Roadway Design





CONTACTS

W. Scott Jones
Engineer for Maintenance
wsjones@utah.gov
801-965-4789

Jeff Lewis
Safety Programs Engineer
jefflewis@utah.gov
801-965-4285

UDOT Keeping Utah Moving

Zero Fatalities