Texas A&M Transportation Institute

Incorporating Operating Speed in Statistical Road Safety Modeling: An Interactive Risk Assessment Tool

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Overview

Synopsis

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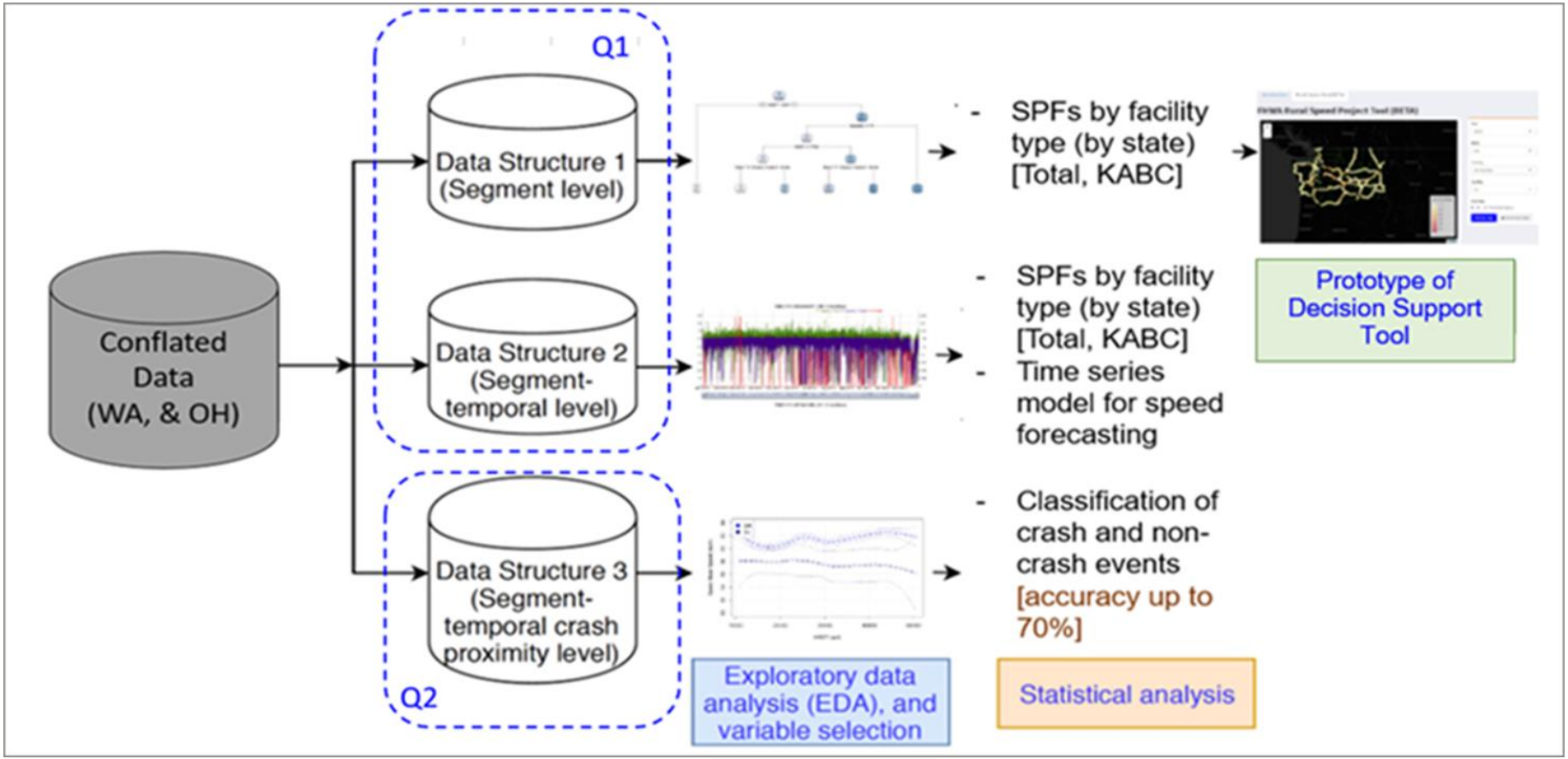
- Research is needed to target the reduction of rural roadway crashes to allocate resources for the safety improvements.
- **Association between operating speed and safety is still non-decisive.**
- In the HSM and Texas specific safety performance functions, ***short-term traffic measures such as operating speed and traffic volume are not used***.
- Conventional modeling technique with ***data aggregation has been a major factor of inaccuracy*** because microscopic information is lost in the process.
- This study developed an interactive decision support tool as a **pilot project of USDOT Safety Data Initiative (SDI).**

Study Design and Analysis

Study Framework



Results and Tools

Annual-level crash prediction models

- Show that increased variability in hourly operating speed within a day and an increase in monthly operating speeds within a year are both associated with a higher number of crashes.
- Show that when operating speed difference between weekends and weekdays is greater, all rural facility roadways (rural two-lane, rural multilane, and rural interstate) experience a higher number of crashes.

Daily-level crash prediction models

- Show how that a segment with high variation in daily average speeds is expected to experience a higher number of crashes than a segment with a lower variation in daily speeds.

Examination of time before and after crashes

- Shows that speed variation increases significantly before a crash.

RuralSpeedSafetyX

Interactive Decision Support Tool to Improve Safety

Year
2015

State
WA

County
All Counties

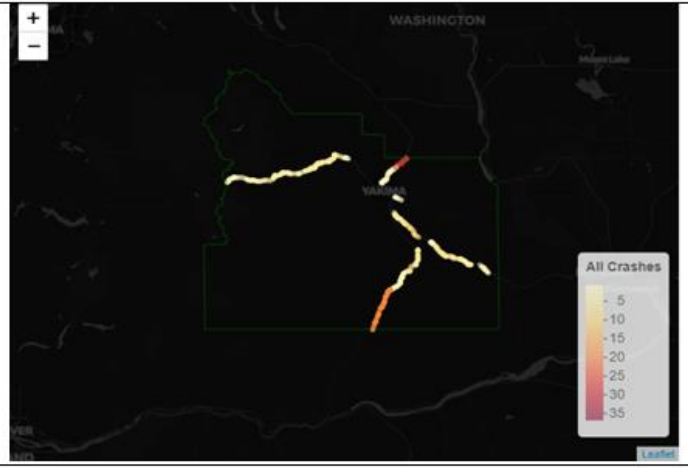
Facility
All

Severity
All Fatal and Injury

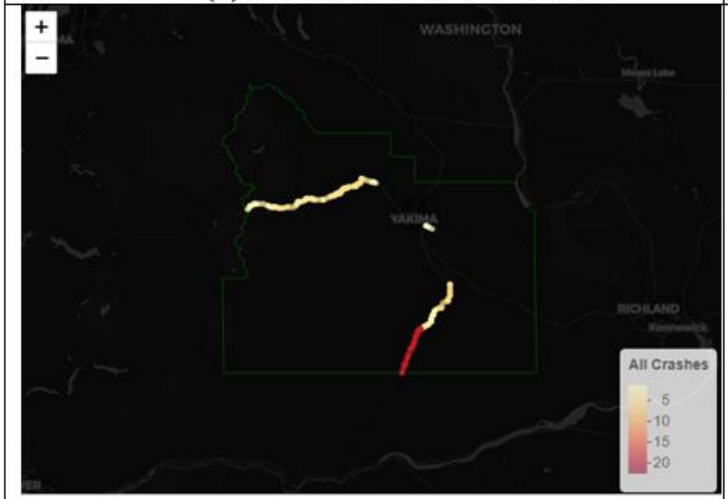
Refresh Map Download Data

Interactive Tool: https://subasish.shinyapps.io/RuralSpeedSafetyX/

(a)Selection at State Level



(b) Selection at County Level



(c) Selection at County and Facility Type Level

(d) Hovering Option

Example Roadway Segment


Preston
UPPER PRESTON
TMC: 114N04103
Road: I-90
State: WA
County: King County
Facility: Interstate
Total Expected: 33.74
Fatal, Injury Expected: 10.19
AADT: 60132
Speed Variance 1: 2.43
All Crashes
5
10
15
20
25
30
35
40
Leaflet

Key Takeaways

- This pilot project establishes a framework of data integration and analytical procedure that will help to address the effect of operating speed measures on safety.
- The major outcome of this project is **the safety prediction models (annual and daily)** by incorporating speed and weather data.
- Another outcome of this project is a beta version of interactive decision support tool that shows segment-level annual crash estimates using Washington and Ohio data.


Questions?

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