Centerline Buffers in Rural West Texas

John Speed, PE, Odessa TxDOT District Engineer
The Odessa District
The Odessa District

Overview - Odessa District

- 12 Counties
- 18,343 Sq. Miles
- 8,160 Lane Miles
- 286 Employees
- Main corridors are I-20/I-10
The Odessa District and Permian Basin Energy

Energy in the Permian

- Produces 40% of US oil and 15% of natural gas
- Oil production has doubled in last 3 years
- Fracking materials are mined within the Basin
- Largest wind energy production zone in the US

Safety Challenges

Crash Heat Map
SH 158 – The Original Roadway
Traffic Statistics – SH 158, Pre-Installation of 4’ Centerline Buffer

- Traffic Volumes: 8,800 VPD (2016)
- Truck Percentages: 29%
- Pavement needed to be resurfaced
- In 2-years prior to reconstructing pavement:
  - 6 of 8 fatalities (K) were from opposite direction crashes
  - Over half of the KAB crashes were single-vehicle
  - Same-direction and angle crashes accounted for only a quarter of the KAB crashes
- NCHRP 17-66 Guidance for Selection of Appropriate Countermeasures for Opposite Direction Crashes noted no less than 4’ buffers
SH 158 with Added 4’ Centerline Buffer
SH 158 with Added 4’ Centerline Buffer
SH 158 – Assessing the Effectiveness of the Centerline Buffer
Traffic Statistics – SH 158, Post-Installation of 4’ Centerline Buffer

- **Traffic Volumes** 11,000 VPD (2019) (25% increase)
- **Truck Percentages** 30%
- In 2-years after reconstructing pavement:
  - Fatal opposite direction crashes dropped by \( \frac{2}{3} \)ths
  - Injury OD crash rate dropped by over 80%
  - Single-vehicle KAB crashes dropped by 70%
  - BUT, same-direction and angle crashes more than tripled
- This raises questions . . .
Next Steps: Four-Lane Candidate Project – SH 349

- Traffic Volumes: 9,900 VPD
- Truck Percentages: 22%
- Pavement needed to be resurfaced; able to retain at least 8’ shoulders
- In last 4 years:
  - 9 opposite direction crashes with injuries, 2 with fatalities
  - 42 single vehicle crashes with injuries, 2 with fatalities
- How might 4’ buffer affect same-direction and angle crashes?
Two-Lane Candidate Project – FM 1450, Reeves/Pecos Counties

- Traffic Volumes 3,400 VPD
- Truck Percentages 34%
- Shoulders, turn-lanes and accel/decel lanes are being added
- Roadway width is overbuilt to accommodate traffic control
- In last 4 years, there was one opposite direction crash with injuries, 0 with fatalities
- Is 4’ centerline buffer appropriate, even if pavement width is available?
Need for an Objective Evaluation

- Is there a relationship between 4’ centerline buffer and reduction in shoulder widths?
- Were the crash changes coincidence, correlation or causation?
- Can centerline buffers be effectively used on SH 349 and FM 1450?
- We asked Texas A&M Transportation Institute and Srinivas Geedipally, PhD, PE to study these questions.